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Document -1 INTRODUCTION OF APSCHE NEW SYLLBUS-2023-2024

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Guidelinesfor EvaluationoftheFoundationalLevelCoursesofthe1st Semesterinthe4-yearUGHonoursProgramsw.e.f2023-24

1. **Background:**

Commencingintheacademicyear2023-24,a4-yearundergraduate(UG)Honors Program, is launched. This unique program encompasses both a SingleMajorandaMinor.

Within the first semester of this 4-year UG program, two fundamental courseshavebeendesigned.Thesecoursesfallintofourdistinctcategories:onecategoryis consistent across all arts and social sciences majors, another is tailored forcommerce and business administration majors, a third category is designed forbiological sciences majors, and the fourth category is intended for studentsmajoring in mathematics, statistics, physical sciences, chemical sciences, andcomputerscience.

It'simportanttonotethatthesecoursesarefoundationalinnature.

2. **Objectivesofdesigningthefirsttwocourses:**

The courses in the first semester of graduate programs serve various objectives,with the primary goal of providing students with the necessary skills, knowledge,andpreparationtosucceedintheirchosenfieldofstudy.Thespecificobjectivesofintroducingpathwaycoursesinclude:

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1. PrepareStudentsforAdvancedStudyinaMajororforchoosingaMinor:
One of the primary objectives is to prepare students for the rigor of

advancedgraduate-levelcourseworkbybridginganyknowledgeorskill gaps they mayhave.The courses shall also help the students in choosing a particular Minor ofhis/herinterest.

2. EnsureaStrongFoundation:
Help students build a strong foundational understanding of the core conceptsand principles in their field, ensuring that they have the necessary backgroundtosucceedinmorespecializedcourses.

3. AddressDiverseBackgrounds:
Accommodatestudentswithdiverseacademicbackgroundsandexperiences,allowingthemtocomeuptospeedregardlessoftheirprioreducation.

4. PromoteInterdisciplinaryUnderstanding:
Encourageaholisticunderstandingofthesubjectmatter,especiallyinunderstanding the multidisciplinary or interdisciplinary nature of the chosendomainofstudy,bycoveringabroadrangeoftopicsandperspectives.

5. FosteraGrowthMindset:
Instill a growth mindset and a commitment to lifelong learning, encouragingstudents to understand and adapt to new challenges and opportunities in theirfield.

6. EnsureCompliancewithProgramRequirements:
Ensurethatstudentsmeettheminimumrequirementsforadmissionintothegraduate program, especially in cases where students may lack prerequisites fortheirdesiredprogram.

7. EnhanceRetentionandGraduationRates:
Improveretentionandgraduationratesbygivingstudentsthetoolstheyneedtosucc

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eed,reducingattritionduetounpreparedness.

8. CustomizeLearningExperiences:
Allow students to choose their minor and online courses to align with theirindividual needs and career goals, ensuring a more personalized educationalexperience.

9. ProvideTransitionalSupport:
Offeracademicandtransitionalsupportservices to help students acclimate tothedemandsofgraduate-leveleducation.

Thus,thesecoursesaredesignedtosupportstudents'academicandprofessional development, ensuring they are well-equipped to excel in theirchosengraduateprogramsandmakemeaningfulcontributionstotheirrespect ivefields.

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3.Listofcoursesdesigned–

ForArtsandSocialSciences:

1. FundamentalsofSocialSciences
2. PerspectivesonIndianSociety

ForCommerce/BusinessAdministration:

1. Fundamentals ofCommerce
2. BusinessOrganization

ForBiologicalSciences

1. IntroductiontoClassicalBiology
2. IntroductiontoAppliedBiology

ForMathematics/Physical/Chemical/ComputerSciences:

1. EssentialsandApplicationsofMathematical,PhysicalandChemicalScie nces
2. AdvancesinMathematical,Physical,andChemicalSciences.

Universitiesarealsogiventhefreedomtodevisesuchtypesofcourseswhereverneces sary,meetingthestatedobjectives.

4. EvaluationMethodology:

As these courses have been structured with distinct and individualized goals,thereisarecognizedneedforastandardizedevaluationapproach.Conseque ntly,it is suggested that the assessment of these courses will adopt an objectiveformat, encompassing multiple choice questions, completion exercises, matchingexercises,conciseone-wordresponses,andsuccinctone-sentenceresponses.

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5. Objective Formatof Evaluation

The main aims of having an objective format in the evaluation methodology ofthesecourseswhichareatthefoundationlevelare-

1. **ConsistencyandFairness:** Objectiveformats,suchasmultiple-choicequestions, provide a standardized and consistent method of assessment.
Thishelpsensurethatallstudentsareevaluatedbasedonthesamecriteria,promotingfairnessintheevaluationprocess.

2. **Efficiency:** Objective assessments can be efficiently administered and graded,particularly in larger classes. This saves time and resources for both faculty andstudents.

3. **Objective Measurement:** Objective assessments offer a more objective andquantifiable measure of a student's knowledge and skills. The results are lesssusceptibletosubjectivityorbiasonthepartofthegrader.

4. **Assessment of Diverse Learning Objectives:** Objective formats can assess awide range of learning objectives, from basic recall of facts (remembering) to morecomplex skills like analysis, application, and evaluation. This versatility makesthemsuitableforvariouscoursesandlearningoutcomes.

5. **Alignment with Learning Objectives:** Objective questions can be carefullyaligned with specific learning objectives, ensuring that the assessment
directlymeasureswhatstudentsareexpectedtoknowandbeabletodo.

6. **Reliability:**
Objectiveassessmentstendtohavehigherreliabilitybecausetheyare less prone to subjective interpretation. Reliable assessments consistentlymeasureastudent'sknowledgeandskills.

7. **Validity:** Properly designed objective assessments are often considered to havehigh content validity because they can cover a broad range of content areas.
Theycanalsobedesignedtomeasureotherformsofvalidity,suchasconstructorcriterion-relatedvalidity.

8. **Scalability:**

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9. Objectiveformatsareeasilyscalabletoaccommodatelargerstudentpopulations,makingthemsuitableforbothsmallandlargeclasses.

10. **Data Analysis:** Objective assessment results can be subject to quantitativedata analysis, which can be valuable for program evaluation, improvement, andaccreditationpurposes.

11. **FeedbackforCourseImprovement:**
Byanalyzingtheresultsofobjectiveassessments,instructorsandinstitutionscanidentifyareaswherestudentsmaybestrugglingandmakecurriculumadjustmentstoimprovestudentlearningoutcomes.

12. **AssessmentofFundamentalConcepts:**
Objectiveassessmentsareparticularlyeffectiveforevaluatingfundamentalconceptsthatserveasafoundationformoreadvancedcoursework.

6. AligningtheevaluationwithBloom'sTaxonomy:

Bloom'sTaxonomyofeducationalobjectivesisaframeworkthatcategorizesdifferentlevelsofcognitivelearningandthinkingskills.Thetaxonomyincludessixmajorlevels,organizedfromthelowestorderofthinkingtothehighestorder:

Remembering:
Atthislevel,learnersdemonstratetheabilitytorecallfacts,information,orconcepts from memory. This involves recognizing or recalling previously learnedmaterial.

Understanding:
At this level, learners grasp the meaning of information. They can explain ideas,concepts, or theories in their own words, demonstrating comprehension andinterpretation.

Applying:
Applyingreferstousingknowledgeorconceptsinnewsituationsorcontexts.Learners demonstrate their ability to take what they've learned and apply it tosolveproblemsorcompletetasks.

Analyzing:
At this level, students break down information into its constituent parts

andexaminetherelationshipsbetweenthoseparts.Theyidentifypatterns,connections,andstructureswithinthematerial.

Evaluating:

This level involves making judgments or assessments about the value or qualityofideas,theories,solutions,orproducts.Learnersusecriteriatomakeinformeddecisionsandjustifytheiropinions.

Creating:

CreatingisthehighestlevelofBloom'sTaxonomy.Atthislevel,studentsgenerate new ideas, products, or solutions. They combine elements to form acoherentwholeandusetheircreativitytoproducesomethingoriginal.

Theselevelsarehierarchical,witheachlevelbuildingupontheskillsandknowledge developed at the previous level. Bloom's Taxonomy is widely used ineducationtodeveloplearningobjectives, designcurricula, and createassessmentsthattargetspecificlevelsofcognitive development. It helpseducatorsensurethattheirteachingandassessmentmethodsalignwiththedesiredlearningoutcomes.

7. esigninganObjectiveTestFormat:

Designing objective questions for evaluating these foundation courses involvescreatingquestionsthateffectivelyassessstudents'understandingandknowledgeofthefundamentalconceptsandskillstaughtinthecourse.Designingobjectivequestions,includingmultiple-choicequestions(MCQs),trueor false questions, and fill-in-the-blank questions, by aligning them with thedifferentlevelsofBloom'sTaxonomyisdesirable.Thefocusshallbeon-

1. UnderstandingtheLearningObjectives:

Start by thoroughly understanding the learning objectives of the foundationcourse.Theseobjectivesshouldguidethequestiondesign.

2. DeterminingQuestionTypes:

Decideonthetypesofobjectivequestionsthataretobeincludedintheevaluation. Common types include MCQs, true or false questions, and fill-in-the-blankquestions,matching,one-wordorone-sentenceresponses.

3. CategorizingbyCognitiveLevel:

Categorizing the learning objectives and topics based on the cognitive levels ofBloom'sTaxonomy,whichinclude,Remembering,Understanding,Applying,Analyzing,Evaluating,andCreating.

4. Balancing theCognitiveLevels:

A balanced distribution of questions across the cognitive levels, with a focus onassessing different levels of understanding needs to be ensured. This will helpevaluatewhetherstudentshavegraspedthefoundationalknowledgeand canapplyitappropriately.

5. WritingMCQs:

- For Remembering: Creating MCQs that assess students' recall of basic factsandconcepts.
- ForUnderstanding:DesigningMCQsthatevaluatecomprehensionofprinciplesortheories.
- ForApplying:FormulatingMCQsthatchallengestudentstousetheirknowledgetosolveproblemsormakedecisions.
- ForAnalyzing,Evaluating,andCreating:Thesehigher-orderlevelsmay bemorechallengingwithMCQs,butstill,questionscanbe framed that involvecriticalthinking.Forinstance, asking students to choose the best solutionamongoptions,evaluatingthecorrectness of statements, or completingscenarios.

6. WritingTrueorFalse Questions:

True or false statements shall also align with the learning objectives. Thesequestions are particularly suitable for assessing understanding and recallingfactualinformation.

7. WritingFill-in-the-BlankQuestions:

Fill-in-the-blank questions shall be used to assess students' ability to completesentences,definitions,orstatements.Thesequestionscanbeeffectivefortestingknowledgerecall.

8. AvoidAmbiguity:

It is to be ensured that all questions and statements are clear and free fromambiguity.Eachquestionshouldhaveasinglecorrectanswer.

9. BalancingandSequencing:

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Distributing questions evenly throughout the evaluation and arranging themlogicallyintermsofdifficultyandcognitivelevelsneedstobeensured.

10. GradingRubrics:
Ifapplicable,providegradingrubricsforopen-endedquestionsandclearguidelinesonhowtoevaluateanswersmaybeprovided.

The process of creating objective questions to assess these foundational coursesnecessitatesthoughtfulreflectiononthecourse'sobjectivesandthe cognitivelevels that need to be appraised. It is essential to develop an efficient evaluationinstrumentthataccuratelygaugeswhetherstudentshaveacquiredthe vitalknowledgeandcompetenciestaughtinthesefoundationalcourses.

8. SemesterEnd Evaluation & Internal Assessment:

70 marks for Semester End Examination and 30 marks for Internal Assessment.Proportionate changes could be made if there is a change in the marks
assignedforSemesterEndandInternalAssessments.Theexaminationwillhav eamaximumdurationof2hours.QuestionPaperPattern:

QUESTIONPAPERTAXONOMY										
LevelofBloom's Taxonomy	TypeofQuestion&mAssigned									
	MCQs		FIB		VSQ		MC		T/F	
	CIA	SEE	CIA	SEE	CIA	SEE	CIA	SEE	CIA	SEE
Remembering	3m	10m								
Understanding	3m	10m								
Applying	4m	10m								
Analyzing					5m	10m				
Evaluating							5m	10m	5m	10m
Creating			5m	10m						

MCQs:MultipleChoiceQuestions1markperquestion.1.5minutestoanswerFIB:F

illintheblanks.1markforquestion.1.5minutetoanswer

VSQ:Veryshortanswerquestions.1markperquestion.1.5minutetoanswerMC:

Matching.5marksformatchingof5items.2.5minutestoanswer

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T/F:TrueorFalse.1markperquestion.1.5minutestoanswer
(m: marks; CIA: Continuous Internal Assessment; SEE: Semester EndExaminations)

9. EachUniversityshallpreareaQuestionBankasperthe QuestionPaperTaxonomysuggestedabove.

10. Universitiesshallprepare4seriesofQuestionPapercumAnswerBook lets marked A, B, C, and D with the questions jumbled, with equalweightageforallunitsofthesyllabus.

11. The seating plan of the examination hall shall be prepared for studentsin multiples of 4 plus 2 or 8 plus 2 in a column as is done in the conductofcompetitiveexaminations.

12. ThequestionpapercumanswerbookletshallbeartheRegisternumbe rof students and the question paper code (A or B or C or D) of thatparticularcandidate.

13. Forveryshortanswerquestionsanswersshallbegiveninonesentence andgradingrubricsshallbeprovidedforevaluation.

14. Thekeyforthequestionpaperseriesshallbeprovidedandshallbeinthecu stodyoftheControllerofExaminations.

15. Itisdesirabletoconductheseexaminationsonline.

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Document -2 GUIDELINES

Guidelinesforthe4-YearUGHonours ProgramwithSingleMajorandoneMinor(w.e.f.A.Y.2023-2024)

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Guidelinesforthe4-YearUGHonoursProgramwithSingleMajorandoneMinor(w.e.f.A.Y.2023-2024)

TableofContents:

1.BackgroundandContext

The NationalEducationPolicy(NEP)2020recognizesthathighereducation plays an extremely important role in promotinghuman as well as societal well-being and in developing Indiaas envisioned in its Constitution - a democratic, just, sociallyconscious,cultured,andhumanenationupholdinglibert y, equality, fraternity, and justice for all. It notes that "given the 21st - centuryrequirements,qualityhighereducationmustaimtodevelopgood,though tful,well-rounded,andcreativeindividuals".

In accordance with the NEP 2020, the UGC has formulated a new student-centric "Curriculum and Credit Framework for Undergraduate Programmes(CCFUP)"incorporatingaflexiblechoice-basedcreditsystem,multidisciplinary approach, and multiple entry and exit options. This willfacilitatestudentstopursuetheircareerpathbychoosingthesubject/fieldoft heirinterest.

In consonance with NEP 2020 the Government of Andhra Pradesh rolled outa redesigned CBCS curriculum for 4-year UG HonoursProgrammes from theyear 2020-21. With the CCFUP guidelines released in December 2022, the APState Council of Higher Education has taken up the task of redesigning thecurricularframeworkfortheUGDegreeProgrammes.

TheAPStateCouncilofHigherEducation(APSCHE)hasconstitutedanExpertCom mitteevideProcgs. No. APSCHE/AC-I/CBCS-2023-24/ReviewDt. 13.03.2023 under the Chairmanship of Prof. K. Rama Mohana Rao, Vice-ChairmanAPStateCouncilofHigherEducation.Ontherecommendationsof the Committee, 4-year UG Honours Program with a single Major and oneminorisintroducedfromtheA.Y.2023-2024.

Thecontextfortheintroductionofnewcurriculumandcreditframework

1. ChangingEducationalLandscape:Thehighereducationlandscapeisconstant lyevolving,influencedbyemergingtechnologies,globalization,industry requirements, and societal changes. To ensure that undergraduateprogramsremainrelevantandalignedwiththeneedsofstudentsa ndthejobmarket,itisessentialforregulatorybodiestoperiodicallyreviewandup datethecurriculumandcreditframework.

2. Quality Enhancement: The APSCHE has introduced the new curriculumandcreditframeworkin4-yearUGHonourswithSingleMajorandoneminoras part of its efforts to enhance the quality of undergraduate education. Bysetting updated guidelines and standards, the state can promote consistency,rigor,andalignmentwithglobaleducationalpractices.

3. Employability and Skill Development: The APSCHE recognizes the need toalign undergraduate programs with the demands of the job market and theevolving needs of the industry. This new curriculum and credit framework willemphasizethedevelopmentofemployabilityskills,multidisciplinaryknowledge, and practical experiences through internships and/or industrycollaborations.

4. Flexibility and Choice: Students today seek greater flexibility and choice intheir educational journey. The new curriculum and credit framework aims toprovidestudentswithmoreoptionstotailortheircourseofstudy,selectelectives,or exploreinterdisciplinarysubjects.Thiscanhelpfosterholisticdevelopmentandcatertodiversestudentinterestsandaspirations.

5. AlignmentwithGlobalStandards:TheAPSCHEconsidersaligningundergraduate programs with international standards and best practices.Thiscouldinvolveincorporatingelementssuchasoutcome-basededucation,credit transferability, and flexible learning pathways to ensure compatibilityandrecognitionofIndiandegreesintheglobalacademicarena.

6. Technology Integration: Considering the technological innovations andinterventions in higher education, the new curriculum provides high flexibilityto apply technology in the teaching and learning process. The students canoptforonlineminorcourses,skillcourses,multi-disciplinecourses,andsomeof the core courses also. The use of AR, and VR is encouraged to facilitate theHEIstoofferanumberofmajorsandminors.

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2. ProgramOverview

A. ProgramNameandDuration

4-YearUGHonourswithSingleMajor.
The duration of the Program is 4 years, with multiple entry and exitoptions after 1st,2ndand 3rdyears of study with a certificate, diplomaand degree after the respective years of study.Honours Degree isawardedattheendof4-yearsofstudy.

- 4–YearUGHonourswithResearchwithmultipleentryandexitoptionsafter1st,2ndand3rdyearsofstudywithacertificate,diplomaanddegreeafter the respective years of study.Honours with Research Degree isawardedattheendof4-yearsofstudy.

B. ProgramObjectivesandGoalsofUGHonoursinSingleMajor

- DepthofKnowledge:Singlemajorprogramsallowstudentstofocusonaspecificdiscipline,enablingthemtodevelopin-depthknowledgeandexpertiseintheirchosenfield.

- By concentrating their studies on a single major, students have theopportunitytodelvedeeplyintothesubjectmatter,engageinadvanced coursework,andpursuespecializedresearchorprojects.

- ClarityandSpecialization:Singlemajorprogramsprovidestudentswitha clear academic pathway and a focused direction for their studies. Theycan pursue their passion and interests in a specific discipline withouttheneedtodividetheirtimeandattentionacrossmultiplemajors.Thisclarityoffocusallowsstudentstospecializeintheirchosenfield,potentiallyenhancingtheirfuturecareerprospects.

- EfficientUseofResources:Singlemajorprogramscanbemoreefficientintermsofresourceutilizationforbothstudentsandinstitutions.Studentscanallocatetheirtime,energy,andresourcestowardsmastering a single subject area, maximizing their learning experience.Institutions can streamline their course offerings, faculty resources,andinfrastructuretosupportsingle-majorprogramsmoreeffectively.

- Time Management and Graduation Timelines: Pursuing a single majorprogramcanofferadvantagesintermsoftimemanagementandgraduationtimelines.Withafocusedacademicplan,studentsmayhavea clearer roadmap for completing their degree requirements within theexpected timeframe. This can potentially minimize delays in graduationandfacilitateasmootheracademicjourney.

- FlexibilityandElectiveChoices:Single-majorprogramsoftenprovidestudentswithflexibilityinchoosingelectivecoursesandexploringinterdisciplinarystudies.Byfocusingonasinglemajor,students mayhavemoreroomintheircurriculumtopursueelectivecoursesthatcomplementtheirprimaryareaofstudyorexplorerelateddisciplinesthatalignwiththeirinterests.

- ResearchandCareerAlignment:Singlemajorprogramscanbetteralignwithstudents'researchinterestsandcareergoals.Byimmersingthemselvesinaspecificfield,studentshavemoreopportunitiestoengageinresearchprojects,internships,andpracticalexperiencesdirectly related to their major. This specialization can enhance theirexpertiseandmakethemmorecompetitiveintheirchosencareerpath.

- Reduced Course Load and Stress: Pursuing a single major programtypicallyinvolvesalowercourseloadcomparedtothreemajorprograms. This can help reduce the stress and academic burden onstudents, allowing them to focus more deeply on their coursework,engage in extracurricular activities, and maintain a better work-lifebalance.

- EnsuringMultidisciplinaryandInterdisciplinarylearning.

- Opportunityforlearnerstochoosethecoursesoftheirinterestinalldisciplines;

- FacilitatingmultipleentryandexitoptionswithUGcertificate/UGdiploma/ or degree depending upon the number of credits secured andperiodofstudy;

- Onlinelearning,andhybridmodesofblendedlearningensured.

- Integrated CommunityService Project intothecurriculum.

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- Internship/OntheJobTraining(bothinphysicalorvirtualmode)incorporated in two stages, one, a short-term internship during thesummer vacation between 2nd and 3rd years of study and the other afull-semesterinternship,eitherintheVorVIsemester.

- Multidisciplinarycoursesarememandatory.

- SkillEnhancementcoursesareintroduced.

- Mandatory OpenOnlineTransdisciplinary coursesareintroduced.

- CoursesonIndianKnowledgeSystemsintroduced.

- Multipleentryandexitoptionsareprovided.

- OneMinorwith6coursesand24creditsiscompulsory.

3. ProgramStructureandCurriculum

A. CreditRequirements

- ForUGHonoursDegreethenumberofcreditsrequiredis160alongwith 20additionalcreditsassignedforCommunityServiceProject(4credits), Short Term Internship (4 credits) and Semester Internship(12credits).

- These 160 credits are apportioned as, 84 for Major Courses, 24 forMinor Courses, 12 for Languages, 6 for Multidisciplinary Courses,28 for Skill Courses, 4 for Open Online Transdisciplinary Coursesand2forCommonValue-AddedCourses.

- The thumb rule for assigning credits is 1 hour of theory per week isequivalent to 1 credit.Similarly, 2 hours of practical per week isequivalent to 1 credit. ThecreditsassignedforInternship/Apprenticeship/OJTarenottobee qualizedwiththehoursofworkdone.

- Astudentcanacquireamaximumof40%ofcreditsonline.

B. MajorCourses

- Major discipline is the discipline or subject of main focus and thedegreewillbeawardedinthatdiscipline.Studentsshouldsecurethe minimum prescribed number of credits, i.e., 84 (about 50% of totalcredits)throughcorecoursesinthemajordiscipline.

- AstudentofUGHonoursDegreehastostudy21coursepaperswith84cre ditsinthechosenmajor.TheeligibilityforadmissionintoaMajorwillbes imilartotheexistingeligibilityforaprogram.**Eligibility:** APSCHE will publish the eligibility criteria inconsultationwithuniversitiesforalltheUGprogrammes.

- UniversitiescanoffernewMajorsinadditiontothoseidentifiedfortheA.Y.2 023-24withpriorpermissionofAPSCHE.

- AstudenthastochooseoneMajorforgainingin-depthknowledgeinthatsubjectdiscipline.

- All discipline-specific major courses carry a weightage of 4 credits,irrespective of the discipline of study, viz., arts, commerce, science,etc.Wherever practicals are involved, 3 credits are assigned for 3hours of theory and 1 credit is assigned for 2 hours of practical. Forall courses without practicals, 4 credits are assigned for 4 hours oftheory.

- The first two courses in the Major shall be the foundation coursesfor that Major and shall be pathway courses to choose their Minorinthesecondsemester.

- In the case of Mathematics there will be 5 hours of workload perweek which includes practice sessions (NOT PRACTICALS) and thenumberofcreditsassignedis4.

- InthecaseofB.Com.,ComputerApplicationsorforBCAorwhereverComputerScience/Applicationsinvolvedsubjectsorcoursesareoffered, the courses (papers) shall have 3 hours of theory and 2hoursofpractical.

C. MinorCourses

- StudentshavetochooseaMinorinthesecondsemester.Thestudent can choose a minor cutting across the disciplines or fromtheallieddisciplines.

- Astudenthastostudy6coursesinthechosenminorwith24credits.The minorcoursesstartfromthesecondsemesteronwards.

- Someminorsmayrequireeligibilitytostudyaparticularcourseattheintermediatelevel.Suchconditions,if any, will be notifiedagainsttheminor.

- Astudentcancompleteasecondminoronlinefromapprovedsources during the period of study and submit the credits to theuniversityforinclusionintheDegreecertificate.

- Minorcoursescanbestudiedofflineoronlineorinblendedmode.

- UniversitiescanaddnewminorswithanintimationtoAPSCHE.

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D. Languages

- TwocoursesinEnglishLanguageandtwocoursesinModernIndianLanguagearetobecompletedinthefirsttwosemesters.
- Eachlanguagecourseistaughtfor4hourswith3credits.
- A student can opt for doing the English Language Courses onlinewhich are equivalent to IELTS/TOEFL/OET, etc.Or the minimumrequiredscoresforqualifyinginIELTS/TOEFL/OETcanbereckonedforthe6creditsassignedforEnglishLanguage.

E. SkillCourses

- Enhancingstudentemployabilityisthetoppriorityforhighereducation. Employability is a measure of a student's ability to securetheirfirstjobandremainemployedthroughouttheirworkinglives.
- A pool of Skill Enhancement Courses is offered in Semesters I to IV.These Skill Enhancement Courses are contemporary in nature andnotmajor-specific.
- Astudenthastocomplete6suchcourses(2creditseach)inSemesters I to IV assigned with 12 credits. Students are offeredchoicesforselectingskillenhancementcoursesoftheirinterest.
- Major subject-specific Skill Enhancement courses with choices areofferedinSemesterV/VIastwoofthefourmajorcourses.
- AndtwoSkillEnhancementcourseseachwithchoicesareofferedinSemestersVIIandVIIIintheconcernedmajor.
- UniversitiescanaddnewSkillenhancementcourseswithanintimationtoAPSCHE.

F. MultidisciplinaryCourses

- In consonance with NEP – 2020 all UG students are required toundergo multidisciplinary courses.These courses are intended tobroadentheintellectualexperience.
- Studentsarenotallowedtochoosethecoursesinamajordiscipline

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or repeat coursesalready undergone atthe higher secondarylevel orIntermediatelevelor12thclassasthemultidisciplinarycourse.

- Astudenthastocomplete3multidisciplinarycourseseach carrying2credits.
- Studentsareofferedchoices for selecting multidisciplinary coursesoftheirinterest.
- Universities can add new multidisciplinary courses with anintimationtoAPSCHE.

G. CommonValue-AddedCourses

- CommonValuedAddedCourseincludesEnvironmentalscience/education,andshallcarry2credits.

H. CoursesonIndianKnowledgeSystems

- Courses on IKS are integrated into the curricular framework.TheIKS course shall be an Audit Course which is a mandatory coursewithonlyaPassorFail.
- A student has to complete 2 courses on IKS one in the VII semesterandoneintheVIIIsemester.
- StudentsareofferedchoicesforselectingIKScoursesoftheirinterest.
- UniversitiescanaddnewIKScourseswithanintimationtoAPSCHE.

I. OpenOnlineTransdisciplinaryCourses

- TwomandatoryOpenOnlineTransdisciplinaryCourses,with2credits per course, are to be done by the students, one in each ofSemestersVIIandVIII.
- Studentsarefreetoselectcoursesoftheirinterestfromanydiscipline.

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J. 10-monthmandatoryInternship

Threeinternshipsaremandatoryforallstudentsirrespectiveoftheoftheprogramofstudy.

Firstinternship(April-Mayafter 1st year examinations): **CommunityServiceProject**

- Toinculcatesocialresponsibilityandcompassionatecommitmentamong the students, the summer vacation in the intervening 1st and2ndyearsofstudyshallbeforCommunityServiceProject.
- Learningoutcomes:
  - Tofacilitateanunderstandingoftheissuesthatconfrontsthevulnerable/marginalizedsectionsofthesociety.
  - Toinitiateteamprocesseswiththestudentgroupsforsocietalchange.
  - Toprovidestudentsanopportunitytofamiliarizethemselveswithurban/ruralcommunitytheylivein.
  - To enable students to engage in the development ofthecommunity.
  - Toplanactivitiesbasedonthefocusedgroups.\
  - Toknowthewaysoftransformingsocietythroughsystematicprogrammeimplementation.

UniversitiesandcollegesshouldfollowtheAPSCHEguidelinesforthecommunityserviceprojectandtheprogrambookdesignedforthepurpose.

SecondInternship(April-Mayafter2nd yearexaminations):Apprenticeship/Internship/On-the-jobtraining/In-houseProject/Off-siteProject

- Tomakethestudentsemployable,anApprenticeship/Internship/Onthejobtraining/In-houseProject/Off-siteProjectshallbeundertakenby the students in the intervening summer vacation between the 2ndand3rdyears.

- Learningoutcomes
  - Explorecareeralternativespriortograduation.
  - Integratetheoryandpractice.
  - Assessinterestsandabilitiesintheirfieldofstudy.
  - Learn to appreciatework and itsfunctiontowardsfuture .
  - Developworkhabitsandattitudesnecessaryforjobsuccess.
  - Developcommunication,interpersonalandothercriticalskillsinthefuturejob.
  - Buildarecordofworkexperience.

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- Acquireemploymentcontactsleadingdirectlytoafull-timejobfollowinggraduationfromcollege.

Universities and colleges should follow the APSCHE guidelines for the short-termprojectandtheprogrambookdesignedforthepurpose.

Thirdinternship(5th/6thSemesterperiod):

Duringtheentire5th/6th Semester, the student shall undergoApprenticeship / Internship / On the Job Training.This is to ensure that thestudents develop hands on technical skills which will be of great help in facingtheworldofwork.

- Learningoutcomes
  - Explorecareeralternativespriortograduation.
  - Integratetheoryandpractice.
  - Assessinterestsandabilitiesintheirfieldofstudy.
  - Learn to appreciatework and itsfunctiontowardsfuture .
  - Developworkhabitsandattitudesnecessaryforjobsuccess.
  - Developcommunication,interpersonalandothercriticalskillsinthe futurejob.
  - Buildarecordofworkexperience.
  - Acquireemploymentcontactsleadingdirectlytoafull-timejobfollowinggraduationfromcollege.
  - Acquireadditionalskillsrequiredfortheworldofwork.

UniversitiesandcollegesshouldfollowtheAPSCHEguidelinesfor thesemestertermprojectandtheprogrambookdesignedforthepurpose.

Forcompletedetailsvisitwww.apsche.gov.in

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4. MultipleEntryandExitOptions

- Purpose:
  Flexibilityisimportanttochooseone'sacademicpathwaytotheawardof certificate, diploma, and degree.There are occasions when learnershave to give up their education mid-way for various reasons.Theacademicrecords/marks/creditsforsuchincompleteacademicprogrammes remain unaccounted.In order to address such issue, thecurriculum framework paves way for multiple entry and exit in to thedegreeprogramme.

- The purpose of Multiple Entry and Exit Options shall meet the followingobjectives-
  - Aninitiativetocurtailthedropoutrateandimprove GER.
  - Offersflexibilityinmakingchoicebetweencontinuingofeducation at a stretch for 4 years and exiting and taking up jobandreturningbacktothelearningsystem.
  - Offers different designs of programmes of study, viz., certificate,diploma,degreeanddegreewithhonours.
  - Ensures scaling up from certificate level to degree with honourslevel.
  - Enablescreditaccumulationandtransferofcredits.
  - Ensureszero-year-losstostudentsintheeventofexitinginbetweenthe4-yearprogrammeofstudy.

- OperativeDetailsofME-ME

- 1styear
  - Entry 1: The entry requirement for the 1st year of 4-year Degree(Level–4.5ofNationalCreditFramework(NCrF)ofUGC)isIntermediate/12thclassofCBSE/oranyotherequivalentcertificateapprovedbytheBoardofIntermediateEducation.
  - Exit 1: A Certificate will be awarded when a student exits at theendoftheyear1(Level4.5).
  - Certificate in Sciences/Arts & Humanities/Commerce/BusinessManagement/BusinessAdministration/ComputerApplications /HotelManagementistobeawardedifstudentsexitaftersuccessful completion of 1 year of study in B.Sc / B.A / B.Com /BBA / BBM / BCA / BHM respectively. However, the studentsare required to pass all courses, Languages, Multidisciplinary,SkillEnhancementandCoreCoursesinMajorand

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Minoralong withcompletionofCommunityServiceProjectinthe summerterm.

- 2ndyear:
  - Entry 2: The entry requirement for 2nd year of 4-year Degree(Level–5ofNCrFofUGC)isaCertificateobtainedaftercompletingthefirsttwosemestersoftheundergraduateprogramme.A student can seek entry into the 2nd year of studyinacollege,providedtherearevacanciesinthatparticularprogrammeinthatcollege.Thetransferadmissionshallbewithintheintakepermittedtothecollege.
  - Exit 2: A Diploma will be awarded when a student exits at theendofthe2ndyear(Level5ofNCrF).
  - DiplomainSciences/Arts&Humanities/Commerce/BusinessManagement/BusinessAdministration/ComputerApplications / Hotel Management is to be awarded if studentsexitaftersuccessfulcompletionof2ndyearofstudyinB.Sc/ B.A / B.Com / BBA / BBM / BCA / BHM respectively. However, thestudentsarerequiredtopassallcourses,Languages,Multidisciplinary, Skill Enhancement and Core Courses in Majorand Minor along with completion of Community Service Projectin the summer term between 1st and 2nd year and short-terminternshipinthesummertermbetween2ndand3rdyear.

- 3rdyear:
  - Entry 3: The entry requirement for 3rd year of 4-year Degree(Level–5.5ofNCrFofUGC)isaDiplomaobtainedaftercompletingtwoyears(4semesters)oftheundergraduateprogramme.A student can seek entry into the 3rd year of studyinacollege,providedtherearevacanciesinthatparticularprogrammeinthatcollege.Thetransferadmissionshallbewithintheintakepermittedtothecollege.
  - Exit 3: A Degree will be awarded when a student exits at the endofthe3rdyear(Level–5.5ofNCrF).Bachelor'sDegreeinSciences/Arts&Humanities/Commerce/BusinessManagement/BusinessAdministration/ComputerApplications / Hotel Management is to be awarded if studentsexit after successful completion of 3rd year of study. However, thestudentsarerequiredtopassallcourses,Languages,Multidisciplinary, Skill Enhancement and Core Courses in Majorand Minor along with completion of Community Service

Projectinthesummertermbetween1stand2ndyearandshort-term internshipinthesummertermbetween2ndand3rdyearandafull-semesterinternship.

- TheDegreeawardedshallincludetheMajorandMinor/sinparenthesis.ForEx.,B.Sc(ZoologywithChemistryMinor)

- 4thyear:
  - Entry 4: The entry requirement for 4th year of 4-year Degree(Level – 6 of NCrF of UGC) is a degree obtained after completingthree years (6 semesters) of the undergraduate programme.Astudent can seek entry into the 4th year of study in a college,provided there are vacancies in that particular programme in thatcollege.Thetransferadmissionshallbewithintheintakepermittedtothecollege.
  - Exit 4: A Degree with Honours will be awarded when a studentexits at the end of the 3rd year (Level – 6 of NCrF).Bachelor'sDegreewithHonoursinSciences/Arts&Humanities/Commerce/BusinessManagement/BusinessAdministration/ Computer Applications /Hotel Management with Honours is tobe awarded if students exit after successful completion of 4thyearofstudy.
  - The name of the Major/s shall be indicated in parenthesis andthe name of the Minor/s.For ex., B.ScHonours (Zoology withChemistryasMinor)orB.ScHonours(HistorywithPoliticalScienceasMinor)andsoon.
  - Ifthestudentcompletesthe4thyearwithcoursesinresearchmethodologies and a rigorous research project in one of the majorofstudy,aBachelordegree(Honourswithresearch)isawarded.

5. ProgramOutcomesandBenefits

A. KnowledgeandSkillsDevelopment

- Knowledgeandskillsdevelopmentcanbeexplainedasacrucialprogram outcome and benefit of a 4-year Honours Degree Program. Asstudents progress through the program, they acquire a wide range ofsubject-specific knowledge and general skills that prepare them forsuccessintheirchosenfieldandbeyond.
- **Subject-SpecificKnowledge:**
  In-DepthUnderstanding:The4-yearHonoursDegreeProgramprovides students with an opportunity to develop a deep understandingof their chosen major. Through advanced coursework and specializedstudy,studentsgainexpertiseintheirfieldofinterest.
  Critical Analysis: Students learn to critically analyze complexconceptsandtheorieswithintheirmajor.Theyacquiretheabilitytoevaluateandapplyknowledgetoreal-worldscenarios,fosteringproblem-solvingskills.
- **Interdisciplinary/Multidisciplinary Knowledge:**
  HolisticPerspectives:HonoursDegreeProgramsoftenencourageinterdisciplinarylearning,allowingstudentstoexploreconnectionsbetween different fields of study. This broadens their perspectives andpromotesawell-roundededucation.
  IntegrativeLearning:Studentsdevelopthe abilityto integrateknowledgefromvariousdisciplines,enablingthemtoaddressmultifacetedchallengeswithacomprehensiveapproach.
- **CommunicationSkills:**
  WrittenCommunication:Studentsenhancetheirwrittencommunicationskillsbypreparingreports,essays,andresearchpapers.They learn toarticulate complexideasclearly andeffectively.
  OralPresentation:Throughpresentationsandseminars,studentsdevelop strong oral communication skills, enabling them to presentideasconfidentlyandpersuasively.
- **ResearchandAnalyticalSkills:**
  ResearchExperience:HonoursDegreeProgramwithResearchtypicallyincluderesearchcomponentssuchasacapstoneprojectorthesis.Studentsengageinresearchmethodologies,dataanalysis,andindependentinquiry,honingtheirresearchskills.
  Critical Thinking: Through research and coursework, students cultivatecriticalthinkingabilities,enablingthemtoanalyzedata,evaluateevidence,andformwell-foundedarguments.

B. CareerOpportunitiesandGraduateEmployability

- Career options and graduate employability are the significant programoutcomesandbenefitsofthe4-yearHonoursDegreeProgram.Theprogramequipsstudentswiththenecessaryknowledge,skills,andexperiences to pursue diverse career paths and enhances their potentialforsuccessfulemploymentaftergraduation.
- The 4-year Honours Degree Program provides students with specializedknowledgeandexpertiseintheirchosen fieldof study throughadvancedcourseworkandin-depthstudy.
- Graduates possess a deep understanding of their subject, making themmoreattractivetoemployersseekingcandidateswithspecializedknowledgeandskills.
- Throughouttheprogram,studentsdeveloparangeofindustry-relevantskillssuchascriticalthinking,problem-solving,dataanalysis,research,andcommunicationskills.
- Graduatesarewell-preparedtomeetthe demands of the job marketandcanapplytheirskillseffectivelyinprofessionalsettings.
- Honours Degree Program incorporate mandatory internships; hencegraduatesgainvaluablepracticalexperienceduringtheirstudies,enhancing their employability by demonstrating hands-on skills andindustryexposure.
- Honours Degree Program emphasizes critical thinking and adaptability,preparingstudentsfortherapidlychangingjobmarket.
- Graduatesareequippedtonavigateandthriveindynamicworkenvironments, and they possess a strong foundation for continuouslearningandskilldevelopment.
- Asaresultofthespecializedknowledge,skills,andexperiencesgained,graduates are highly sought after by employers. And enjoy enhancedemployability and marketability, increasing their chances of securingrewardingjobopportunitiesandcareeradvancement.

C. FurtherEducationandPostgraduateStudies

- After completion of the first 3 years of study in the Honours DegreeProgram, if a student exits, he/she is awarded a Degree and is eligibletopursuea2-yearPostgraduateProgram.
- A student getting a UG Honours Degree can do 1-year PostgraduateProgram.
- A student awarded with UG Honours Degree with Research is eligibletogetdirectadmissionintoPh.D.programprovidedthestudentsecures75%andabovemarks.

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6. Appendices

A. Curriculumframework

B.Sc(Honours)withSingleMajor

Semester	Major* (4Cr)			Minor (4Cr)			Languages(3Cr)			Multi Disny' (2Cr)			SkillEnhancement Courses(2 Cr)			OOTC			Env.Edn(2 Cr)			Total		
	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr
Sem1	2*	10	8				2	8	6	1	2	2	2	4	4							7	24	20
Sem2	2	6+4	8	1	3+2	4	2	8	6				2	4	4							7	27	22
CommunityServiceProjectof180hourswith4Credits. StudentiseligibleforExitOption-1withtheawardofCertificateinrespectivediscipline																								
Sem3	4	12+8	16	1	3+2	4				1	2	2	1	2	2							7	29	24
Sem4	3	9+6	12	2	6+4	8				1	2	2	1	2	2							7	29	24
Short-TermInternship/Apprenticeship/OJT of180hourswith4Credits. StudentiseligibleforExitOption-2withtheawardofDiplomainrespectivemajorwithminor																								
Sem5	4	12+8	16	2	6+4	8													1	2	2	7	32	26
Sem6	SemesterInternship/Apprenticeship/OJT with12Credits. StudentiseligibleforExitOption-3withtheawardofDegreeinrespetivemajorwith																							
																				IKS#				
Sem7	3	9+6	12										2*	6+4	8	1	2	2	1	2	0	6	29	22
Sem8	3	9+6	12										2*	6+4	8	1	2	2	1	2	0	6	29	22
	21		84	6		24	4		12	3	6	6	10	32	28	2	4	4	2	4	0	47		**160**

20AdditionalCreditsfor10monthmandatoryInternship/OJT/Apprenticeship

C Courses **H** Hours **Cr** Credits **OOTC** OpenOnlineTransdisciplinary

IKS# IndianKnowledge Systems-AuditCourse

B.A/B.Com/BBA(Honours)withMinor

Semester	Major* (4Cr)			Minor (4Cr)			Languages(3Cr)			Multi Disny' (2Cr)			SkillEnhancementCourses (2Cr)			OOTC			Env. Edn(2Cr)			Total		
	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr
Sem1*	2	8	8				2	8	6	1	2	2	2	4	4							7	22	20
Sem2	2	8	8	1	4	4	2	8	6				2	4	4							7	24	22
CommunityServiceProjectof180hourswith4Credits. StudentiseligibleforExitOption-1withtheawardofCertificateinrespectivediscipline																								
Sem3	4	16	16	1	4	4				1	2	2	1	2	2							7	24	24
Sem4	3	12	12	2	8	8				1	2	2	1	2	2							7	24	24
Short-Term Internship/Apprenticeship/OJTof180 hourswith4 Credits. StudentiseligibleforExitOption-2withtheawardofDiplomainrespectivemajorwith																								
Sem5	4	16	16	2	8	8													1	2	2	7	26	26
Sem6	SemesterInternship/Apprenticeship/OJTwith12Credits. StudentiseligibleforExitOption-3withtheawardofDegreeinrespetivemajorwithminor																							
																				IKS#				
Sem7	3	12	12										2*	8	8	1	2	2	1	2	0	6	24	22
Sem8	3	12	12										2*	8	8	1	2	2	1	2	0	6	24	22
	21		84	6		24	4		12	3	6	6	10	32	28	2	4	4	2	4	0	47		**160**

20AdditionalCreditsfor10monthmandatoryInternship/OJT/Apprenticeship

C Courses **H** Hours **Cr** Credits **OOTC** OpenOnlineTransdisciplinary

IKS# IndianKnowledgeSystems-AuditCourse

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B. GuidelinesforUGHonourswithresearch

UGHonourswithResearch

1. Students have to choose after the completion of the third year of study,theHonoursprogramforthefourthyearofstudy.
2. TheycanpursueHonoursprograminthe major/minor domain ofjoininginHonourswiththeresearchprogramme.
3. If the student wants to join in Honours with research, he/she shouldpass all the courses in the first three years of the UG program andsecure75%ormoremarks.
4. ForSemester7,thecurricularstructureincludes3commoncourseson Research Methodologies and 2 discipline-specific courses in the 7thsemester.
5. In the 8thSemester, the student has to complete an individual researchproject in one of the three subjects of his/her study in the first threeyears.

6. CoursesonResearchMethodology(7thSemester): Theco ursestructureforthe7thSemestershallbeasfollows:**B.A./B.Co m./BBA/BCA,etc:**

1. Course7.1(7thSemesterCourse1) ResearchMethodology:ConceptualandTheoreticalPerspectives
2. Course7.2 ResearchMethodology:ObservationalandEmpiricalPerspectives
3. Course7.3 StatisticalAnalysis using Computer Packages forResearchMethodology
4. Course7.4 IntroductiontoSocialScienceResearch
5. Course7.5 QuantitativeApproachtoSocialScienceResearch

B.Sc(Statistics/Mathematics/ComputerScience)

1. Course7.1 ResearchMethodology:ConceptualandTheoreticalPerspectives
2. Course7.2 ResearchMethodology:ObservationalandEmpiricalPerspectives
3. Course7.3 StatisticalAnalysis using ComputerPackagesforResearchMethodology
4. Course7.4 AdvancedStatisticalMethodsforDataAnalysis(ForStatisticsstudents)
5. Course7.4

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AdvancedAreasofComputerScience(ForComputerSciencestudents)
6. Course7.4
AdvancedMathematicsforResearch(ForMathematicsstudents)
NOTE: For Statistics students, apart from Courses 7.1, 7.2 and 7.3 beingmandatory courses, sl no.4 is compulsory and they can opt for sl no.5 or 6astheir5thCourse.

For Computer Science students, apart from Courses 7.1, 7.2 and 7.3 beingmandatory courses, sl no.5 is compulsory and they can choose between sl.nos.4and6astheir5thCourse.

In case of Mathematics students, apart from Courses 7.1, 7.2 and 7.3 beingmandatorycourses,slno.6iscompulsoryandtherewillbeachoicebetweenslnos.4and5astheir5thCourse.

B.Sc(PhysicalSciences/ChemicalSciences)
1. Course7.1
ResearchMethodology:ConceptualandTheoreticalPerspectives
2. Course7.2
ResearchMethodology:ObservationalandEmpiricalPerspectives
3. Course7.3
Statistical Analysis using Computer Packages forResearchMethodology
4. Course7.4
AdvancedAnalyticalTechniquesforScienceResearch
5. Course7.5
MaterialsScience

B.Sc(BiologicalSciences)
1. Course7.1
ResearchMethodology:ConceptualandTheoreticalPerspectives
2. Course7.2
ResearchMethodology:ObservationalandEmpiricalPerspectives
3. Course7.3
StatisticalAnalysis using Computer Packages forResearchMethodology
4. Course7.4
AdvancedAnalyticalTechniquesforScienceResearch
5. Course7.5
AdvancedTechniquesinBiologicalSciences

7. OpenOnlineCourses
AStudentshalldoTWOOpenOnlineTransdisciplinaryCourses,inSemesters 7 & 8.The Online Courses can be of students' choice, either inthesamedomain/relateddomainormultidisciplinaryinnature.The

OnlineCoursescanalsobedoneeitherinSWAYAMorNPTELorCOURSEERA or from any other resources recognized by the APSCHE andthe competent authority of the respective Universities. The Open OnlineCoursesshallcarry4Creditseach.Studentsshallhaveachoice ofchoosing either two online courses of 2 credits each or one course of 4credits or can acquire a greater number of credits.If a student is desirousofchoosingOpenOnlineCoursesofferedbyindustryorarecognizedo nlinecourse provider, the duration shall be not less than 60 hours for a 4-creditcourse.

AssessmentforOnlineCourses:

If the Online Course is done from among the Online courses offered inSWAYAM or UGC MOOCs or NPTEL, the credits and marks awarded shallbe recognised and calculated for the SGPA and CGPA. The same shall bethecaseifanyserviceproviderconductsanonlineexamination(proctored).If no online examination is conducted either on SWAYAM or UGC MOOCsor NPTEL or proctored examination by the service provider, a pen and paperexaminationbeconductedbytheuniversity.

Year	Semester	CourseCode	TypeofCourse	Hrs/Week	Credits
4	VII	VII.1.8	CommonCourse	5	5
4	VII	VII.2.9	CommonCourse	5	5
4	VII	VII.3.10	CommonCourse	5	5
4	VII	VII.4.11	DisciplineSpecific Course	5	5
4	VII	VII.5.12	DisciplineSpecific Course	5	5
4	VII	VII.6.13	Transdisciplinary OnlineCourse	15Weeks	2
4	VII	VII.7.14	IKS	15Weeks	0
4	VIII	VIII.1.14	ResearchProjectinmajor/minor	15Weeks	25
4	VIII				
4	VIII				
4	VIII				
4	VIII				
4	VIII	VIII.2.15	Transdisciplinary Online Course	15Weeks	2
4	VIII	VIII.3.16	IKS	15Weeks	0

8. **Individual Research Project in Semester 8 for students ofCommerce,Arts,Management,Languages,etc**:

GuidelinesfortheResearchProjecttobedoneduringVIIISemester

Objectives:
Thepurposeofthiscourseistointroducestudentstotheprocessofconducting social science research projects.The students will be helped toconceptualise,designandexecutearesearchprojectbyateacherguide.

Structure:
Most of the sessions in this semester will be designed in a seminar format.Thiswillbesupplementedbyindividual/groupconference/supervision. Thefocuswillbeondiscussionsandanalysisofassignments.
Learners will be encouraged to read books and research journals related tohis/herresearchtopicandsharethemintheseminars.
Learnerswillbeinitiatedtothinkaboutresearchissuesthroughoutthesemester, debate these issues with teachers and classmates and synthesizetheseissuesmentallytodevelopasaresearcher.
Being a research degree, this course will entail (1) a much higher workloadthananybachelor'sdegreecoursestudiedsofar(2)aheavydoseofreadi ngs,and(3)asubstantialamountofcriticalthinking.

DurationoftheProject:15WeeksMethodofA

ssessment:
ContinuousInternalEvaluation 100marks(spreadacrossthesemester)
SemesterEndExternalEvaluationshallbeconductedattheendoftheSemester.
Dissertation 200marks
Seminar 100marks
Vivavoce 100 marks

There shall be a panel of three Examiners for the Semester End ExternalEvaluation, comprising of Faculty Supervisor, one faculty member-internalexaminerandoneexternalexaminer.

ResearchProjectWorkSchedule:

A. **IndividualResearch Projectin Semester VIII for students of BA, B.Com,BBA,BCA,etc**:

Week 1: ResearchSeminar
Learners will be helped to select a topic of his/her choice and prepare a paper(3-4pages)andpresentitinaseminarorganisedbythedepartmentintheendoftheweek.
Method of Internal Assessment: Two faculty members (Faculty supervisor andthefacultymemberwhoisteachingresearchmethodologypapers)

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Week2:ResearchProposal

In this week using the learning of the previous semester about the researchprocesslearnerswouldpreparearesearchproposal.

Learners will select a research problem of his/her choice for this proposal andsubmit it at the end of the week.This proposal will be 5 to 6 pages. It wouldinclude(1)researchproblemand significance, (2) literature review, (3)theoryand hypotheses,(4)research design(5) Sampling (6) tool of datacollection (7) data processing and analysis and (8) plan of research report. Thelearner will be required to present his/her research proposal at the end of theweekin15-20minutesintheclassroom.

Method of Internal Assessment: Two faculty members (the Faculty supervisorand the faculty member who is teaching research methodology courses) willassesstheproposal.

Week3:DataCollection

Inordertocollecttherequisitedataforresearchstudy,learnersarerequiredtoanduse thetoolsofdatacollectiondevised/selectedduring the lastsemester. Learners are advised to go for pre-testing of tool of data collectionselecting5to10respondentsandreviseormodifytheirtool.

Week4:DataCollection

Inthisweekthelearnerswillgotothefieldandcollectdatafromtherespondentsselect edforthestudyinthepreviousemester.

MethodofInternalAssessment:Thefacultysupervisorwillassessthemethodand proceduresusedbythelearnerindatacollection.

Week5:DataProcessingusingSPSS

Oncethedataarecollected,thelearnerswillbehelpedtoprocessit.Theywillbe required to prepare a Code Book and a Master Chart. This is essential toprocess the data using SPSS. Learners will be helped to define data, enterdatainDataEditorofSPSS.

Method of Internal Assessment: Faculty supervisor will assess the methodandproceduresusedbylearnerindatacollection.

Week6:DataAnalysisusingSPSS

In this week the learners will be helped to prepare a plan of tabulation andexecuteit.Thetabulationplanmayincludealistofindependentanddependen tvariables,univariatetables,bivariatetables,trivariatetablesand

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a list of statistical procedures to be applied. Accordingly, the learners willgenerateTablesandStatisticaltestresults.

MethodofInternalAssessment:Thefacultysupervisorwillassessthemethodand proceduresusedbythelearnerindatacollection.

Week7andWeek8:WritingofChapterI:Introduction

The research report starts with the 'Introduction' of the research problem. Itintroduces the topic or research under investigation and its importance. Theintroductorychaptergivesthebackground tothe specific area ofinvestigation.Thisisfollowedbyabriefstatementoftheproblemunderstudy.It is also necessary to explain the significance of the present problem. Hereresearcher is expected to describe precisely and clearly the objective(s) of theresearch study. This isfollowedby the statement of the proposed hypothesesofthestudythatwouldbetestedthroughstatisticalprocedures.

MethodofInternalAssessment:Thefacultysupervisorwillassessthemethodand proceduresusedbythelearnerindatacollection.

Week9:WritingofChapterII:ReviewofLiterature

The next task of the researcher is to present a review of the relevant literature.This includes a critical analysis of earlier research studies. As such, whilereviewing the literature, it should be kept in mind that literature has beencritically examined in terms of agreements and disagreements among theresearchersinordertojustifythenecessityforconductingtheresearchstudy.

MethodofInternalAssessment:Thefacultysupervisorwillassessthemethodand proceduresusedbythelearnerindatacollection.

Week10andWeek11:WritingofChapterIII:ResearchMethodologyThisisfoll owedbyadescriptionofthedesignofastudy.Thissectionprovidesadetailedoverv iewof"how"thestudywasconducted.Thevarioussub-sectionsinclude:i)descriptionoftheresearchdesignofthestudy,ii)variables:thei ndependent,dependentandcontrolvariableswiththeiroperationaldefinitions;ii i)samplingprocedures:definingthepopulation,anddrawingofsampleforthepre sentstudy;iv)listinganddescribingmethodsandtoolsofdatacollectionusedinth estudy,likequestionnaires,attitudescales, etc., their reliability, validity and administration etc.; v) describing thestatisticalproceduresusedintheanalysisofdataincludingtherationaleoftheu seandmethodofdataanalysis.

MethodofInternalAssessment:Facultysupervisorwillassessthemethodandproc eduresusedbylearnerindatacollection.

Week12andWeek13:WritingofChapterV:DataAnalysisandInterpretation

The outcome of the research is presented in tabular form with the help ofstatistical procedures. The data are analysed and interpreted and presentedin the form of a research report. If necessary, the findings are also presentedgraphically.Thefiguresdonotnecessarily;repeatthetables,butpresentdatavisuallyforeasyunderstandingandeasycomparisons.

MethodofInternalAssessment:Thefacultysupervisorwillassessthequalityofanalysisandinterpretationofdata.

Week14andWeek15:WritingofChapterVI:MajorFindings,ConclusionsandDiscussions

Thisisusuallythefifthchapterofaresearchreport.Themajorfindingsofthestudy analyzed and interpreted in the preceding chapter are precisely andobjectivelystatedinthischapter.Thefourthchaptercontainssuchpresentations as only a trained researcher can understand because of thecomplexitiesinvolved,butinthefifthchapter,themajorfindingsarepresented in a non-technical language so that even non-trained researcherssuchasaplanneroranadministratorinthefieldcanmakesenseoutofthem.

The major findings are followed by a discussion of the findings. The majorfindings are compared with the findings of other related research studieswhichhavealreadybeenreviewedinthesecondchapterofthereport.Accordingly,thehypothesesformulatedinthefirstchapterareeitheraccepted or rejected. In case the null-hypotheses are rejected, alternativehypothesesareaccepted.Ifthefindingsdohaveanydiscrepancyincomparison with those of other researches, or if the findings do not explainsufficientlythesituationorproblemunderstudy,oriftheyareinadequateforgeneralizations, explanations with proper justification and explanation havetobeprovided.

MethodofInternalAssessment: Thefacultysupervisorwillassessthepresentation of major findings, conclusions and discussions and will give agrade.

ThoughtheResearchProjectiscompletedintheVIIISemester,theworkcould beinitiatedintheVIISemesteritself.

B.IndividualResearchProjectinSemesterVIIIforStudentsofScience:

GuidelinesfortheResearchProjecttobedoneduringVIIISemester

Identificationof ResearchProject:
The student has to select a topic which is interesting to him/her and relatedtosubjectwhichisrelevanttosocietyorindustry.Thetitleofthetopiccanbe designedwiththeconsultationoftheresearchsupervisor.

Objectives:
Thepurposeofthiscourseistointroducestudentstotheprocessofconductingscie nceresearchprojects.Thestudentswillbehelpedtoconceptualise, design and execute a research project by a teacher guide. Thestudents have to identify the objectives related to the topic of the researchprojectproposed.

Structure:
Most of the sessions in this semester will be designed in a seminar format.Thiswillbesupplementedbyindividual/groupconference/supervision. Thefocuswillbeondiscussionsandanalysisofassignments.
Learners will be encouraged to read books and research journals related tohis/herresearchtopicandsharethemintheseminars.
Learners will be initiated to think about research issues throughoutthesemester,debate theseissueswith teachers and classmates and synthesizetheseissuesmentallytodevelopasaresearcher.
Being a research degree, this course will entail (1) a much higher workloadthananybachelor'sdegreecoursestudiedsofar(2)aheavydoseofreadi ngs,and(3)asubstantialamountofcriticalthinking.

DurationoftheProject:15WeeksMethodofA

ssessment:

ContinuousInternalEvaluation 100 marks(spreadacrossthesemester)

Semester-EndExternalEvaluationDissertatio
n 200marks
Seminar 100marks
Vivavoce 100 marks
(shallbeconductedattheendoftheSemester)
There shall be a panel of three Examiners for the Semester End ExternalEvaluation, comprising of Faculty Supervisor, one faculty member-internalexaminerandoneexternalexaminer.

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ResearchProjectWorkSchedule:

Week 1: ResearchSeminar

Learners will be helped to select a topic of his/her choice and prepare a paper(3-4pages)andpresentitinaseminarorganisedbythedepartmentattheendoftheweek.
Method of Internal Assessment: Two faculty members (Faculty supervisor andthefacultymemberwhoisteachingresearchmethodologypapers)

Week2:ResearchProposal

In this week using the learning of the previous semester about the researchprocess learners would prepare a research proposal. Learners will select aresearch problem of his/her choice for this proposal and submit it at the endof the week.This proposal will be 5 to 6 pages. It would include (1) anIntroduction of the research problem, (2) Review of the literature related totheproblem,aimsandobjectivesoftheproposedresearchproblem(3)Materials and Methods related research problem (4) Results related to themethodsbyusingwithsuitablestatisticaltools,(5)Discussion,SummaryandConclusionoftheresearchfindingsonbasisoftheproposedproblem,submitsomeofthesignificantreferencesasabibliography.Learnerswillberequiredtopresenthis/herresearchproposalattheendoftheweekin15-20minutesintheclassroom.

Method of Internal Assessment: Two faculty members (the Faculty supervisorand the faculty member who is teaching research methodology courses) willassesstheproposal.

Week3:LiteratureCollection

In order to collect the requisite literature for the research study, learners arerequired to and use various methods of information through review articles/research journals/ various web links. Learners are advised to prepare a reviewof the literature related to the research proposal through the recent literatureinformation. This will strengthen the design of the Aim and objectives of theresearchproposal.

Week4:DesigningoftheMethodology

Inthisweekthelearnerswillcollecttheliteraturerelatedtothemethodologyto be used in the present proposed research proposal by using different SOPs.Theinterpretationofthedataobtainedfromtheresultsalsocanbeselectedforthepresentstudy.

Method of Internal Assessment: Faculty supervisor will assess the methodandproceduresusedbylearnerindatacollection.

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Week 5:ResultsProcessingandanalysis

Oncetheresultsare obtained,thelearners will be used various methods intherepresentationoffigures,tabular,and graphical methods to process it.Theanalysisoftheresultswillbeprocessedbyusingvariousdatapackages.

MethodofInternalAssessment:Thefacultysupervisorwillassessthemethodand proceduresusedbythelearnerindatacollection.

Week 6: Discussion on the interpretation of the results, summary andconclusion

In this week the learners will be helped to discuss the results obtained in thepreviousweekandinterprettheresultsbyusingthesupportingliteraturepublish edearlier.Afterthoroughdiscussion,thesummary can be obtainedwith the respective results obtained earlier. Finally, it will be concluded thefindingsofthepresentproposedresearchproposal.Itwillbefollowed byadding the references as a bibliography and also appended the preparation ofsolutions,buffers,mediaetc.,

MethodofInternalAssessment:Thefacultysupervisorwillassessthemethodand proceduresusedbythelearnerindatacollection.

Week7andWeek8:WritingofChapterI:Introduction

The research report starts with the 'Introduction' of the research problem. Itintroduces the topic or research under investigation and its importance. Theintroductorychaptergivesthebackground tothe specific area ofinvestigation.Thisisfollowedbyabriefstatementoftheproblemunderstudy.Itisal sonecessarytoexplainthesignificanceofthepresentproblem.

MethodofInternalAssessment:Thefacultysupervisorwillassessthemethodand proceduresusedbythelearnerindatacollection.

Week9:WritingofChapterII:ReviewofLiterature

The next task of the researcher is to present a review of the relevant literature.This includes a critical analysis of earlier research studies. As such, whilereviewing the literature, it should be kept in mind that literature has beencritically examined in terms of agreements and disagreements among theresearchersinordertojustifythenecessityforconductingtheresearchstudy. Here researcher is expected to describe precisely and clearly the Aim(s) andobjective(s)oftheresearchstudy.

Method of Internal Assessment: Faculty supervisor will assess the methodandproceduresusedbylearnerindatacollection.

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Week 10 and Week 11: Writing of Chapter III : Materials and Methodsrelatedresearchproblem

Thisisfollowedbyadescriptionofthedesignofastudy.Thissectionprovidesa detailed overview of "how" the study was conducted. The various sub-sectionsinclude:i)descriptionoftheresearchdesignofthestudy,ii)variables:thei ndependent,dependentandcontrolvariableswiththeiroperationaldefinitions;i ii)samplingprocedures:definingthepopulation,anddrawing of sample for the present study; iv) listing and describing methodsand tools of data collection used in the study, like questionnaires, attitudescales, etc., their reliability, validity and administration etc.; v) describing thestatistical procedures used in the analysis of data including the rationale oftheuseandmethodofdataanalysis.

MethodofInternalAssessment:Thefacultysupervisorwillassessthemethodand proceduresusedbythelearnerindatacollection.

Week 12 and Week 13: Writing of Chapter IV: Results processing andanalysisrelatedtothemethodsbyusingsuitablestatisticaltools

The findings of the results will be presented in the form of figures/photos,tabular and graphically. The outcome of the research is presented in tabularform with the help of statistical procedures. The results are analysed andinterpretedandpresentedintheformofaresearchreport.Thefiguresdonotn ecessarily;repeatthetables,butpresentdatavisuallyforeasyunderstandingand easycomparisons.

MethodofInternalAssessment:Thefacultysupervisorwillassessthequalityofanalys isandinterpretationofdata.

Week14andWeek15:WritingofChapterV:Discussion,SummaryandConc lusionoftheresearchfindingsonthebasisoftheproposedproblem

The fifth chapter inthe research report deals with the discussion based onresultswhichareanalysedwith theinterpretation of the literature.Depending on the interpretation of the discussion with the correlation of theresultsthesummaryoftheresearchproblemcanbe narratedin achronologicalway.TheConclusionwillbegivendependingontheresearchfinding of the proposed problem. After conclusion, the references will be addedas a bibliography and followed by the appendix as preparation of solutions,buffersandmediaoranyotherinformationrelatedtotheresearchproposal .Ifpossible,thefacultysupervisormayadvisethestudenttosubmittheplagiarism certificate, which will be useful to the candidate to understand thewritingskillsoftheresearchreport.

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MethodofInternalAssessment:Thefacultysupervisorwillassessthepresentationof majorfindingsdependingonthemethodologyused,presentationofresults, interpretationof the results with discussion,summaryoftheproposedresearchproblemandconclusion.

ThoughtheResearchProjectistobecompletedintheVIIISemester,thework couldbeinitiatedintheVIISemesteritself.

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B.A/B.Com/BBA(Honours)withMinor

Semester	Major*(4Cr)			Minor(4Cr)			Languages(3Cr)			Multi Disny'(2Cr)			SkillEnhancementCourses(2Cr)			OOTC			Env. Edn(2Cr)			Total		
	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr
Sem1*	2	8	8				2	8	6	1	2	2	2	4	4							7	22	20
Sem2	2	8	8	1	4	4	2	8	6				2	4	4							7	24	22
CommunityServiceProjectof180hourswith4Credits. StudentiseligibleforExitOption-1withtheawardofCertificateinrespectivediscipline																								
Sem3	4	16	16	1	4	4				1	2	2	1	2	2							7	24	24
Sem4	3	12	12	2	8	8				1	2	2	1	2	2							7	24	24
Short-TermInternship/Apprenticeship/OJTof180hours with 4Credits. Studentis eligibleforExitOption-2 withtheaward ofDiplomainrespectivemajorwith																								
Sem5	4	16	16	2	8	8													1	2	2	7	26	26
Sem6	Semester Internship/Apprenticeship/OJTwith12Credits. StudentiseligibleforExitOption-3withtheawardofDegreeinrespetivemajorwithminor																							
																			IKS#					
Sem7	3	12	12										2*	8	8	1	2	2	1	2	0	6	24	22
Sem8	3	12	12										2*	8	8	1	2	2	1	2	0	6	24	22
	21		84	6		24	4		12	3	6	6	10	32	28	2	4	4	2	4	0	47		**160**

20AdditionalCreditsfor10monthmandatoryInternship/OJT/Apprenticeship

CCourses **H**Hours **Cr** Credits **OOTC**OpenOnlineTransdisciplinary

IKS#IndianKnowledgeSystems-AuditCourse

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St.Ann's College for Women

Malkapuram, Visakhapatnam

(Affiliated to Andhra University, Accredited by NAAC with "A" Grade)

B.Sc(Honours)withSingleMajor

Semester	Major*(4Cr)			Minor (4Cr)			Languages (3Cr)			Multi Disny' (2Cr)			SkillEnhancementCourses(2Cr)			OOTC			Env.Edn(2Cr)			Total		
	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr
Sem1	2*	10	8				2	8	6	1	2	2	2	4	4							7	24	20
Sem2	2	6+4	8	1	3+2	4	2	8	6				2	4	4							7	27	22
CommunityServiceProjectof180hourswith4Credits. StudentiseligibleforExitOption-1withtheawardofCertificateinrespectivediscipline																								
Sem3	4	12+8	16	1	3+2	4				1	2	2	1	2	2							7	29	24
Sem4	3	9+6	12	2	6+4	8				1	2	2	1	2	2							7	29	24
Short-TermInternship/Apprenticeship/OJTof180hourswith4Credits. StudentiseligibleforExitOption-2withtheawardofDiplomainrespectivemajorwithminor																								
Sem5	4	12+8	16	2	6+4	8													1	2	2	7	32	26
Sem6	SemesterInternship/Apprenticeship/OJTwith12Credits. StudentiseligibleforExitOption-3withtheawardofDegreeinrespetivemajorwith																							
																			IKS#					
Sem7	3	9+6	12										2*	6+4	8	1	2	2	1	2	0	6	29	22
Sem8	3	9+6	12										2*	6+4	8	1	2	2	1	2	0	6	29	22
	21		84	6		24	4		12	3	6	6	10	32	28	2	4	4	2	4	0	47		160

20AdditionalCreditsfor10monthmandatoryInternship/OJT/Apprenticeship

C Courses **H** Hours **Cr** Credits **OOTC** OpenOnlineTransdisciplinary

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Document : 3 (1) B.Com Syllabus-2023

ANDHRAPRADESHSTATECOUNCILOFHIGHER EDUCATION

Programme:B.Com.GeneralHonours(Major)

w.e.f. AY 2023 24COURSESTRUCTURE

Semester	Course Number	CourseName	No. ofHrs/Week	No. ofCredits
Semester-I	1	FundamentalofCommerce	4	4
	2	BusinessOrganisation	4	4
Semester-II	3	FinancialAccounting	4	4
	4	BusinessManagement	4	4
Semester-III	5	AdvancedAccounting	4	4
	6	IncomeTax	4	4
	7	BusinessLaws	4	4
	8	BankingTheory&Practice	4	4
Semester-IV	9	CorporateAccounting	4	4
	10	Cost&ManagementAccounting	4	4
	11	Auditing	4	4
Semester-V	12	Advertising and Media Planning(OR)Stock Markets	4	4
	13	CustomerRelationship Management(OR)StockMarketsAnalysis	4	4
	14	Digital Marketing (OR) AdvancedCorporateAccounting	4	4
	15	ServiceMarketing(OR)SoftwareSolutions toAccounting		
Semester-VI	**Internship**			
Semester-VII	16	Accounting for Special Institutions(OR)FinancialInstitutionsand Markets	4	4
	17	Indian Accounting Standards (OR)FinancialPlanning	4	4
	18	Banking and Insurance CompanyAccounts(OR) Financial Management	4	4
	SEC			
	19	AccountingTheoryandFinancialReporting(OR)Fundamentalsof FinancialTechnology	4	4

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	20	Advanced ComputerizedAccounting(OR)Investment Management	4	4
Semester-VIII	21	AdvancedCostandManagement Accounting(OR)International FinancialSystem	4	4
	22	AdvancedFinancialAccounting(OR)Financial Reporting	4	4
	23	Corporate Reporting (OR)BehaviouralFinance	4	4
	SEC			
	24	StrategicCostManagement(OR)FinancialDerivatives	4	4
	25	Accounting for ManagerialDecision Making (OR) SecurityAnalysis and PortfolioManagement	4	4

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SEMESTER-I

COURSE1:FUNDAMENTALSOFCOMMERCE

Theory Credits:4 4 hrs/week

LearningObjectives:
Theobjectiveofthispaperistohelpstudentstoacquireconceptualknowledgeofthecommerce, Economy and Role of Commerce in Economic Development. To acquire Knowledgeon Accountingand Taxation.

LearningOutcomes:
Atthe endofthecourse,thestudent willableto
Identify therole commerce inEconomic Development and SocietalDevelopment.Equipwiththe knowledge of imports and exports and Balance of Payments. Develop the skill of accountingand accounting principles. They acquire knowledge on micro and micro economics and factorsdetermine demandandsupply. An idea ofIndian Taxsystem andvarious taxes levied on inIndia. Theywill acquire skills on web designanddigital marketing.

Unit1:Introduction: DefinitionofCommerce–RoleofCommerceinEconomicDevelopment - Role Commerce in Societal Development. Imports and Exports, Balance of Payments. WorldTradeOrganization.

Unit 2: Economic Theory: Macro Economics – Meaning, Definition, Measurements of NationalIncome, Concepts of National Income. Micro Economics – Demand and Supply. Elasticity ofDemandandSupply.ClassificationofMarkets-PerfectCompetition–Characteristics– EquilibriumPrice, Marginal Utility.
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Unit 3: Accounting Principles:Meaning andObjectives Accounting,Accounting Cycle-Branches of Accounting - Financial Accounting, Cost Accounting, Management Accounting.Conceptsand Conventions of Accounting– GAAP.

Unit 4: Taxation: Meaning of Tax, Taxation - Types of Tax- Income Tax, Corporate Taxation,GST, Customs & Exercise. Differences between Direct and Indirect Tax – Objectives of Tax-Concerned authorities – Central Board of Direct Taxes (CBDT) and Central Board of Excise andCustoms(CBIC).

Unit 5: Computer Essentials: Web Design - Word Press Basics, Developing a Simple Website.Digital Marketing - Social Media Marketing, Content Marketing, Search Engine Optimization(SEO),E-mailMarketing.DataAnalytics-
Predictionofcustomerbehavior,customizedsuggestions.

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LabExercise:

- Buildasamplewebsiteto displayproduct information.
- Providewidepublicityforyourproduct oversocial mediaand e-mail
- Estimate the customer behavior and provide necessary suggestions regarding the productsofhis interest.

Activities:

- AssignmentonGAAP.
- GroupActivatesonProblemsolving.
- Collectdateandreportthe roleofCommerceinEconomicDevelopment.
- Analyzethedemandandsupplyofaproductandmakeascheduledbasedonyouranalysis,problems on elasticityof demand.
- IdentifytheTaxanddistinguishbetweenDirectTaxand IndirectTax.
- Assignmentsandstudentsseminarson Demandfunctionanddemandcurves
- QuizPrograms
- AssignmentondifferenttypesoftaxeswhichgenerateRevenuetotheGovernmentofIndia.
- InvitedlecturesonGST andTaxationsystem
- ProblemSolvingExercises on current economysituation.
- Co-operativelearningon AccountingPrinciples.
- GroupDiscussionson problemsrelatingto topics covered bysyllabus
- Examinations(Scheduledandsurprisetests)
- Anysimilaractivitieswithimaginative thinkingbeyondtheprescribedsyllabus

ReferenceBooks:

1. S.P.Jain &K.LNarang, Accountancy-IKalyani Publishers.
2. R.L.Gupta &V.K.Gupta,PrinciplesandPracticeofAccounting,SultanChand
3. BusinessEconomics-S.Sankaran,MarghamPublications,Chennai.
4. BusinessEconomics-KalyaniPublications.
5. Dr.VinodK.Singhania:DirectTaxes– LawandPractice,TaxmannPublications.
6. Dr.MehrotraandDr.Goyal:DirectTaxes– LawandPractice,SahityaBhavanPublications

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SEMESTER-I

COURSE2:BUSINESSORGANIZATION

Theory Credits:4 4 hrs/week

LearningObjectives:
Thecourseaimstoacquireconceptualknowledgeofbusiness,formationvariousbusinessorganizations.
To provide the knowledge on deciding plant location, plan layout and businesscombinations.

Learningoutcomes:
Aftercompletingthiscourseastudentwill have:
Ability to understand the concept of Business Organization along with the basic laws and normsof Business Organization. The ability to understand the terminologies associated with the field ofBusiness Organization along with their relevance andto identify the appropriate types andfunctioningofBusinessOrganizationforsolvingdifferentproblems.TheapplicationofBusinessOrganizationprinciplestosolvebusinessandindustryrelatedproblemsandtounderstandthe concept of SoleProprietorship, Partnership and JointStock Companyetc.

Unit1:Business: Concept,Meaning,Features,Stagesofdevelopmentofbusinessandimportanceofbusiness.ClassificationofBusinessActivities.Meaning,Characteristics,Importance and Objectives of Business Organization.. Difference between Industry & CommerceandBusiness&Profession, ModernBusinessandtheirCharacteristics.

Unit 2: Promotion of Business: Considerations in Establishing New Business. Qualities of aSuccessful Businessman. Forms of Business Organization - Sole Proprietorship, Partnership,Joint Stock Companies & Co-operatives and their Characteristics, relative merits and demerits,Differencebetween Privateand PublicCompany,Conceptof OnePerson Company.

Unit 3: Plant Location and Layout: Meaning, Importance, Factors affecting Plant Location.PlantLayout-
Meaning,Objectives,Importance,TypesofLayout.FactorsaffectingLayout.Size of Business Unit - Criteria for Measuring the Size and Factors affecting the Size. OptimumSizeand factors determiningthe Optimum Size.

Unit 4: Business Combination: Meaning, Characteristics, Objectives, Causes, Forms and KindsofBusinessCombination.Rationalization:Meaning,Characteristics,Objectives,Principles,Meritsand demerits,Differencebetween Rationalizationand Nationalization.

Unit 5: Computer Essentials: Milestones of Computer Evolution – Computer, Block diagram,generationsof computer.InternetBasics-Internet, history,InternetServiceProviders,

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Types of Networks, IP, Domain Name Services, applications. Ethical and Social Implications - Networkandsecurityconcepts-InformationAssuranceFundamentals,Cryptography-SymmetricandAsymmetric,Malware, Firewalls,FraudTechniques,privacyanddataprotection

Activities:

- Assignmentonbusinessorganizationsandmodernbusiness.
- GroupDiscussiononfactors thatinfluenceplanlocation
- Seminarsondifferenttopicsrelatedto Businessorganization
- Casestudycould be given topresentbusiness planof studentschoice.
- Identifyingtheattributesofnetwork(Topology,serviceprovider,IPaddressandbandwidthofyourcollegenetwork) andpreparea reportcoveringnetwork architecture.
- Identifythetypesofmalwaresandrequiredfirewallstoprovidesecurity.
- LatestFraudtechniques used byhackers.

ReferenceBooks:

1. Gupta,C.B.,"BusinessOrganisation",MayurPubliction,(2014).
2. Singh,B.P.,Chhabra,T.N.,"AnIntroductiontoBusinessOrganisation&Management",KitabMahal, (2014).
3. Sherlekar,S.A.&Sherlekar,V.S,"ModernBusinessOrganization&ManagementSystemsApproachMumbai", HimalayaPublishingHouse, (2000).
4. BhusanY.K.,"BusinessOrganization",SultanChand&Sons.
5. Prakash,Jagdish,"BusinessOrganistatonandManagement",KitabMahalPublishers(HindiandEnglish)
6. Fundamentalsof ComputersbyV.RajaRaman
7. CyberSecurityEssentials byJamesGraham, Richard Howard, RyanOlson

SEMESTER-II

COURSE3:FINANCIALACCOUNTING

Theory Credits:4 4 hrs/week

LearningObjectives

The course aims to help learners to acquire conceptual knowledge of financial accounting, toimpartskillsforrecordingvariouskindsofbusinesstransactionsandtopreparefinancialstatements.

LearningOutcomes:

At the end of the course, the student will able to identify transactions and events that need to berecordedinthebooksofaccounts.Equipwiththeknowledgeofaccountingprocessandpreparation of final accounts of sole trader. Develop the skill of recording financial transactionsandpreparationofreportsinaccordancewithGAAP.KnowthedifferencebetweenJointVentures and Consignment. Critically examine the balance sheets of a sole trader for differentaccountingperiods.Design newaccountingformulas &principlesforbusinessorganizations.

Unit-I:Introduction:-NeedforAccounting-Definitions,objectives,functions,-Bookkeeping and accounting - Advantages and limitations - Accounting concepts and conventions -double entry book keeping - Journal - Posting to Ledger - Preparation of Subsidiary booksincludingCashbook.

Unit-II:**FinalAccounts:-**Finalaccounts- PreparationofTradingaccount,Profit& lossaccountandBalanceSheet usingcomputers.

Unit-III:Depreciation: MeaningandCausesofDepreciation-MethodsofDepreciation:StraightLine – WrittenDown Value –Annuityand Depletion Method(includingProblems).

Unit-IV:ConsignmentAccounts: Consignment-Features-ProformaInvoice-AccountSales – Del-credereCommission-AccountingTreatmentintheBooksofConsignerandConsignee-Valuationof ClosingStock -Normaland AbnormalLosses(includingProblems).

Unit-V: Joint Venture Accounts: Joint Venture - Features - Difference between Joint-Ventureand Consignment – Accounting Procedure – Methods of Keeping Records–One Vendor KeepstheAccounts and SeparateSetoffBooks Methods (includingProblems).

Activities:

- Assignmenton Sudsier Books.
- GroupActivateson ProblemsolvinginDepreciation Methods.

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- Collectandexaminethebalancesheetsofbusinessorganizationstostudyhowthesearepreparedd.
- QuizPrograms
- ProblemSolvingExercises
- Co-operativelearning
- GroupDiscussionson problemsrelatingto topics covered bysyllabus
- ReportsonFinancialAccountsfromlocal firms.
- VisitaConsignmentandJointventurefirms (IndividualandGroup)
- Collectionofproformaof bills and promissorynotes
- Examinations(Scheduledandsurprisetests)
- Anysimilaractivitieswithimaginative thinkingbeyondtheprescribedsyllabus

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ReferenceBooks:

1. S.P.Jain&K.LNarang, Accountancy,KalyaniPublishers.
2. R.L.Gupta &V.K.Gupta,PrinciplesandPracticeofAccounting,SultanChand
3. T.S. Reddyand A.Murthy- Financial Accounting,Margham Publications.
4. RanganathamGand Venkataramanaiah,FinancialAccounting,SChandPublications.
5. Tulsan,Accountancy-I-TataMcGraw HillCo
6. V.K.Goyal,FinancialAccountingExcelBooks
7. T.S.Grewal, IntroductiontoAccountancy,SultanChand&Co.
8. Arulanandam,AdvancedAccountancy,HimalayaPublishers
9. S.N.Maheshwari&V.L.Maheswari,AdvancedAccountancyI,VikasPublishers.1
0.Haneefand Mukherjee, Accountancy-I,TataMcGraw Hill

SEMESTER-II

COURSE4:BUSINESSMANAGEMENT

Theory Credits:4 4 hrs/week

LearningObjectives

Thecourseaimstodevelopanunderstandingofprinciples,functionsandchallengesofmanagementandcontemporaryissues in management.

LearningOutcomes:

Atthe endofthecourse,thestudent willableto;

Understand the concept of Business Management along with the basic laws and norms. Able tounderstand the terminologies associated with the field ofBusiness Management and controlalong with their relevance. and to identify the appropriate method and techniques of BusinessManagement for solving different problems. They apply basic Business Management principlesto solve business and industry related problems and to understand the concept of Planning,Organizing,Direction, Motivation and Control etc.

Unit 1: Management: Definition& MeaningofManagement- Henry FayolPrincipalsofManagement and F.W.Taylor's Scientific Management - Functions of Management - Levels ofManagement..

Unit 2: Planning: Planning – Nature, importance, Process of Planning and Types of Planning.Decisionmaking– Process and Types

Unit 3: Organizing: Organizing - Nature & Importance, Principles of Organizing. Delegation &Decentralization – Departmentation – Span of Management. Organizational structure – line, line&staffand functional.

Unit 4: Directing: Functions of Directing - Motivation – Theories of motivation (Maslow NeedandHierarchytheory)andMotivation techniques.Leadership –Stylesof LeadershipandTypes.

Unit 5: Controlling; Nature, importance and Problems – effective coordination. Basic ControlProcessand Control techniques.

Activities:

- StudentSeminars,Debates
- QuizProgrammes
- Assignments
- Co-operativelearning
- Visitafirm(IndividualandGroup)
- GroupDiscussionson problemsrelatingto topics covered bysyllabus

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- Collectingprospectusof differentcompaniesthroughmedia
- Studentscanbegivendifferentsituationsandscenariostostarttheirownbusiness(intermsof capital,liability,the scaleofoperations,etc.)and areasked topresent.
- Studentscanparticipateinarole-playactivityfordescribingthevariouslevelsofManagementandcompetencies.
- Createasimulationexerciseinclasstodemonstratevarioustypesofauthority,delegation,and decentralization ofauthority.
- DemonstratevarioustypesofLeadershipStylesintheformofRolePlaybyidentifyingreal-lifeleaders from thecorporateworld.
- Projectworkonbiographyofwellknownmanagementthinkersandmanagersofcompanies.
- Examinations(Scheduledandsurprisetests)

ReferenceBooks:

1. DinkarPagare,Principlesofmanagement,SultanChand &Sons,New Delhi,2003.
2. C.B.Gupta, Businessmanagement,SultanChand&Sons,NewDelhi,2000.
3. Koontz,O'Donell,Weirich,Essentialsofmanagement,TataMcGraw-HillPublishingCompany,New Delhi 5th Edition (1998)
4. Sherlekar&Sherlekar,Principlesofbusinessmanagement,HimalayaPublishingHouse,NewDelhi, 2000.

SEMESTER-III

COURSE5:ADVANCEDACCOUNTING

Theory Credits:4 4 hrs/week

LearningObjectives

The course aims to help learners to acquire conceptual knowledge of Non-Profit Organizations,understandtheaccountingprocedureofsingleentrysystem,hirepurchasesystemandpartnershipaccounts.

LearningOutcomes:

Atthe endofthecourse,thestudent willableto;

Understand the concept of Non-profit organizations and its accounting process, Comprehend theconcept of single-entry system and preparation of statement of affairs, Familiarize with the legalformalities at the time of dissolution of the firm, Prepare financial statements for partnership firmondissolutionofthefirmandEmploycriticalthinkingskillstounderstandthedifferencebetweenthe dissolution ofthe firmand dissolution of partnership.

Unit 1: Accounting for Non Profit Organizations: Non Profit Entities- Meaning - Features ofNon-Profit Entities –Provisions as per Sec 8 - Accounting Process- Preparation of AccountingRecords - Receipts and Payments Account- Income and Expenditure Account - Preparation ofBalanceSheet(including problems).

Unit 2: Single Entry System: Features – Differences between Single Entry and Double Entry – Disadvantages of Single Entry- Ascertainment of Profit and Preparation of Statement of Affairs(includingProblems).

Unit 3: Hire Purchase System: Features –Difference between Hire Purchase and InstilmentPurchase Systems - Accounting Treatment in the Books of Hire Purchaser and Hire Vendor.(includingProblems).

Unit 4: Partnership Accounts-I: Meaning – Partnership Deed - Fixed and Fluctuating Capitals-Accounting Treatment of Goodwill – Admission, Retirement and Death of a Partner (includingproblems).

Unit 5: Partnership Accounts-II: Dissolution of a Partnership Firm – Application of Garner v/sMurrayRule inIndia –Insolvencyof Partners (includingproblems).

Activities:

- QuizPrograms
- ProblemSolvingexercises

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- Co-operativelearning
- Seminar
- Visitasingle-entryfirm,collectdataand CreationofTrialBalanceofthe firm
- VisitNon-profitorganizationandcollectfinancialstatements
- Criticalanalysisof rateofinterestonhirepurchaseschemes
- Visitapartnershipfirmandcollectpartnershipdeed
- DebateonGarnerv/sMurrayruleinIndiaandoutsideIndia
- GroupDiscussionson problemsrelatingto topics covered bysyllabus
- Examinations(Scheduledandsurprisetests)on allunits
- CollectdatafromyourcollegeandprepareaReceiptandPaymentAccount,IncomeandExpenditureAccount andBalanceSheet

ReferenceBooks:

1. AdvancedAccountancy:TS ReddyandA MurthybyMargham Publications.
2. FinancialAccounting:SNMaheswari &SKMaheswaribyVikasPublications.
3. PrinciplesandPracticeofAccounting:R.L.Gupta&V.K.Gupta,SultanChand&Sons.
4. AdvancedAccountancy: R.L.Gupta&Radhaswamy,SultanChand&Sons..
5. Advanced Accountancy:S.N.Maheshwari&V.L.Maheswari,Vikaspublishers.
6. Advanced Accountancy: Dr. G.Yogeshwaran,JuliaAllen-PBPPublications.
7. Accountancy–III:Tulasian,TataMcGrawHill Co.
8. Accountancy–III:S.P.Jain&K.LNarang,KalyaniPublishers.
9. Advanced Accounting(IPCC):D.G.Sharma,Tax MannPublications.
10. Advanced Accounting:ProfBAmarnadh,SevenHills InternationalPublishers.
11. Advanced Accountancy:MShrinivas&KSreelathaReddy,HimalayaPublishers.

SEMESTER-

IIICOURSE6:INCOMETA

X

Theory Credits:4 4 hrs/week

LearningObjectives:
The objective of this paper is to help students to acquire knowledge and previsions of income taxconcepts and various heads of incomes. To impart skills for calculating various incomes andonlinefillingof taxreturns.

LearningOutcomes:
Atthe endofthecourse,thestudent willableto;
Acquire the complete knowledge of the tax evasion, tax avoidance and tax planning, Understandthe provisions and compute income tax for various sources, Grasp amendments made from timeto time in Finance Act, Compute total income and define tax complicacies and structure andPrepareand FileIT returns of individual at hisown.

Unit-I: Introduction: Income Tax Act-1961 - Basic Concepts:Income, Person, Assesses-AssessmentYear,PreviousYear,RatesofTax,AgriculturalIncome,ResidentialStatusofIndividual-IncidenceofTax–IncomesExempt fromTax(includingproblems).

Unit-II: Income from Salaries: Basis of Charge, Tax Treatment of Different Types of SalariesAllowances, Perquisites, Profits in Lieu of Salary, Deductions from Salary Income, ComputationofSalaryIncome(includingproblems).

Unit-Ill: Income from House Property and Profits and Gains from Business: Annual Value,Let-out/SelfOccupied/DeemedtobeLet-outhouse-DeductionsfromAnnualValue-Computation of Income from House Property Definition of Business and Profession – ProcedureforComputationofIncomefromBusiness–RevenueandCapitalNatureofIncomesandExpenses – Allowable Expenses – Expenses Expressly Disallowed – Computation (includingproblems).

Unit-IV: Income from Capital Gains- Income from Other Sources: Meaning of CapitalAsset – Types – Procedure for Computation of Long-term and Short-term Capital Gains/Losses -Meaning of Other Sources - General Incomes – Specific Incomes – Computation (includingproblems).

Unit-V:ComputationofTotal IncomeofanIndividual: DeductionsunderSection80-ComputationofTotalIncome (Simple problems).

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Activities:

- SeminarondifferenttopicsofIncometax
- Quizprograms
- ProblemSolvingExercises
- DebateonTaxEvasionandAvoidance
- PracticeofprovisionsofTaxation
- VisitaTaxfirm
- TalkonFinance Billat thetimeofUnionBudget
- GuestlecturebyCharteredAccountant
- Presentationoftax rates
- Practiceof filingITReturns online
- IdentifyandeducatetheindividualsnothavingPANCardandhelpthemtoacquireaPANCard.
- FillingouttheonlineapplicationforthePANCardandpreparethesummarizedreportforthe same.
- FindingoutResidentialstatusofanyfiveNRI'sfromyourarea.
- Identifyandevaluatethetaxliabilityofsomeindividualshavingincomeunderdifferentheadsof income.
- Gothroughthee-filingwebsiteoftheGovernmentof India.

ReferenceBooks:

1. Dr.Vinod;K.Singhania;DirectTaxes – Law andPractice,TaxmanPublications
2. T.S. Reddyand Dr. Y. Hari Prasad Reddy -Taxation, byMargham Publications
3. PremrajandSreedhar,IncomeTax,HamsralaPublications
4. B.B.Lal-DirectTaxes;KonarkPublications
5. Dr.MehrotraandDr.Goyal-DirectTaxes, LawandPractice,SahityaBhavanPublication.
6. Balachandran&Thothadri-Taxation LawandPractice,PHILearning.
7. V.P.GaurandD.B.Narang-IncomeTax,KalyaniPublications
8. DrYKiranmayi-Taxation,JaiBharathPublishers
9. IncomeTax,Seven LectureSeries, HimalayaPublications

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SEMESTER-

IIICOURSE7:BUSINESSLA

W

Theory Credits:4 4 hrs/week

LearningObjectives:
The objective of this paper is to help students to acquire knowledgeof business lawsandprevisions of contract. To impart awareness on various sales goods Act and consumer protectionAct.To know thr various cyber laws prevailing.

LearningOutcomes:
Attheend ofthe course,the studentwill ableto;
Understandthelegalenvironmentofbusinessandlawsofbusiness,Highlightthesecurityaspectsinthepresentcyber-crimescenario,Applybasiclegalknowledgetobusinesstransactions, Understand the various provisions of Company Law, Engage critical thinking topredict outcomes and recommend appropriate action on issues relating to business associationsandlegal issues andIntegrate concept ofbusinesslawwithforeign trade.

UnitI:Contract:
Meaning and Definition of Contract - Essential Elements of Valid Contract -Valid, Void andVoidableContracts-Indian Contract Act, 1872

UnitII:Offer,AcceptanceandConsideration:
Definition of Valid Offer, Acceptance and Consideration - Essential Elements of a Valid Offer,Acceptance and Consideration.

UnitIII:Capacityof thePartiesandContingentContract:
Rules Regarding to Minors Contracts - Rules Relating to Contingent Contracts - Different ModesofDischargeof Contracts-Rules Relatingto Remedies toBreach of Contract.

UnitIV:Saleof GoodsAct1930andConsumerProtectionAct2019:
Contract of Sale - Sale and Agreement to Sell - Implied Conditions and Warranties - Rights ofUnpaid Vendor- Definition of Consumer - Person - Goods - Service - Consumer Dispute - ConsumerProtection Councils -ConsumerDisputeRedressal Mechanism

UnitV:CyberLaw:
OverviewandNeedforCyberLaw-ContractProcedures-DigitalSignature–SafetyMechanisms.

Activities:
- SeminaronBasicsof IndianContractAct,1872
- Quizprograms

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- Co-operativelearning
- SeminaronCyberLaw
- GroupDiscussions
- DebateonOffer,Agreement,andContract
- CreationofContractbyabidingrulesofIndianContractAct,1872
- Makingasale byabiding rules of Saleof GoodsAct,1930
- Guestlecturebya Lawyer/Policeofficer
- Celebratingconsumers daybycreatingawarenessamongthe students
- Identify components of valid contracts present in the rent agreement/ saledeed/appointmentlettersused or seen in day-to-daylife.
- Identify and enumerate types of damages in case of breach of contract under different reallifesituations.
- Analyzesomecasestudieswhere‘caveatvenditor’isapplicable.
- Examinations(Scheduledandsurprisetests)
- Anysimilaractivitieswithimaginative thinkingbeyondtheprescribedsyllabus

ReferenceBooks:

1. J.Jaysankar,Business Laws,MarghamPublication.Chennai.
2. NDKapoor, Business Laws,SChandPublications.
3. BalachandramV,Businesslaw,TataMcGrawHill.
4. Tulsian,Business Law,TataMcGrawHill.
5. PillaiBhagavathi,BusinessLaw,SChand Publications.
6. Business Law,Seven HillsPublishers,Hyderabad.
7. KCGarg,Business Law,KalyaniPublishers.

SEMESTER-III

COURSE 8:BANKINGTHEORYAND PRACTICE

Theory Credits:4 4 hrs/week

LearningObjectives:
This course exposes the students to the working of banking and financial system prevailing inIndia.

LearningOutcomes:
Atthe endofthecourse,thestudent willableto;
Understand the basic concepts of banks and functions of commercial banks. Demonstrate anawareness of law and practice in a banking context. Engage in critical analysis of the practice ofbankinglaw.Organizeinformationasitrelatestotheregulationofbankingproductsandservices.Critic allyexaminethecurrentscenarioof IndianBankingsystem.Formulatetheprocedureforbetter serviceto thecustomersfromvarious bankinginnovations.

Unit 1: Introduction: Meaning& Definition of Bank–Functions ofCommercialBanks– CreditCreationwithExamples-KindsofBanks –CentralBankingVs.CommercialBanking.

Unit 2: Banking Systems: Unit Banking, Branch Banking, Investment Banking - Innovations inBanking – E banking - Online and Offshore Banking, Internet Banking - Anywhere Banking - ATMs– RTGS-NEFT–Mobile Banking.

Unit 3: Types of Banks: Indigenous Banking - Cooperative Banks, Regional Rural Banks,SIDBI,NABARD -EXIM Bank.

Unit 4: Banker and Customer: Meaning and Definition of Banker and Customer – Types ofCustomers – General Relationship and Special Relationship between Banker and Customer - KYCNorms.

Unit5:CollectingBankerandPayingBanker: Concepts-
Duties&ResponsibilitiesofCollectingBanker–HolderforValue–HolderinDueCourse– StatutoryProtectiontoCollectingBanker-ResponsibilitiesofPayingBanker-Payment Gateways.

Activities:

- QuizPrograms
- VisittoBanks
- GuestLecturesbybankofficials
- Prepareastatementonperiodicaldeclaration ofRBIlikeSLR,REPOetc.
- Collection,displayand Practicingof fillingof different forms used in banks
- Surveyoncustomerssatisfactionof Bankingservices
- KnowaboutKYCnorms

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- Talk on latest trends in bankingindustry
- OnlineBanking
- Individualandgroupprojectreports
- CurrentAffairsofBankingSector
- StudentSeminars
- Debates
- GroupDiscussionson problemsrelatingto topics covered bysyllabus
- Studentscan gatherthe datarelatingto organizational setup ofvarious banks.
- Groupdiscussioncan be conducted onissues relatingto banks.
- Examinations(Scheduledandsurprisetests)

ReferenceBooks:

1. BankingTheory:Law &Practice:KPMSundramandV LVarsheney,SultanChand&Sons.
2. BankingTheory, LawandPractice: B.Santhanam;MargamPublications.
3. BankingTheoryandPractice,SevenHillsInternationalPublishers,Hyderabad.
4. Bankingand FinancialSystems:Aryasri,TataMcGraw-HillEducation India.
5. IntroductiontoBanking:VijayaRaghavan,Excel books.
6. IndianFinancialSystem:M.Y.Khan,McGrawHillEducation.
7. BankingTheoryand Practice,JagroopSingh,KalyaniPublishers.

SEMESTER-IV

COURSE9:CORPORATE ACCOUNTING

Theory Credits:4 4 hrs/week

LearningObjectives:
This course enables the student to develop awareness about corporate accounting in conformitywiththeprovisions of companyact.

LearningOutcomes:
Atthe endofthecourse,thestudent willableto;
Understand the Accounting treatment of Share Capital and aware of process of book building,Demonstrate the procedure for issue of bonus shares and buyback of shares, Comprehend theimportant provisions of Companies Act, 2013 and prepare final accounts of a company withAdjustments,Participateinthepreparationofconsolidatedaccountsforacorporategroup Understand analysis of complex issues, formulation of well-reasoned arguments and reachingbetter conclusions and Communicate accounting policy choices with reference to relevant lawsand accountingstandards.

Unit 1: Accounting for Share Capital: Kinds of Shares – Types of Preference Shares – Issue ofSharesatPar,DiscountandPremium-Forfeiture andReissueofShares (includingproblems).

Unit2:IssueandRedemptionofDebenturesandIssueofBonusShares: AccountingTreatment for Debentures Issued and Repayable at Par, Discount and Premium -Issue of BonusShares-Buyback of Shares-(includingproblems).

Unit 3: Valuation of Goodwill: Need and Methods - Average Profit Method, Super ProfitsMethod – CapitalizationMethod and AnnuityMethod (includingproblems).

Unit 4: Valuation Shares: Need for Valuation - Methods of Valuation - Net Assets Method,YieldBasis Method,FairValue Method (includingproblems).

Unit 5: Company FinalAccounts:Provisions of the Companies Act,2013- Preparation ofFinal Accounts – Adjustments Relating to Preparation of Final Accounts – Profit and LossAccountandBalanceSheet–(includingproblems with simpleadjustments).

Activities:

- ProblemSolvingExercises
- Collectandfilltheshareapplicationform ofalimitedCompany
- CollectProspectus of acompanyand identifyitssalient features
- CollectannualreportofaCompanyandListoutitsassetsand Liabilities.

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- Collecttheannualreportsofcompanyandcalculatethevalueofgoodwillunder differentmethods
- Powerpointpresentationsontypesofshares andsharecapital
- GroupDiscussionson problemsrelatingto topics covered bysyllabus
- Studentscan gatherthe data relatingtoaccounting set up of somelocal firms.
- AssignmentsincludingtechnicalassignmentslikeworkingwithAuditCompanyforobservation and submit to theteacher aReport.
- Individualprojectworkonidentifiedrealtimesituationswithrespecttopreparationofcompanyfinal accounts
- Onpractical aspectsdealt withbyanAuditor.

ReferenceBooks:

1. CorporateAccounting:T.SReddyandMurthy,MarghamPublications,Chennai.
2. AdvancedAccounts: M CShukla,TSGrewalandS CGupta,S ChandPublications
3. CorporateAccounting:Haneef&Mukherji,TataMcGrawHillPublications.
4. CorporateAccounting:RLGupta&RadhaSwami, SultanChand &sons
5. CorporateAccounting: P.C. Tulsian,S.ChandPublishers
6. AdvancedAccountancy: JainandNarang,,KalyaniPublishers
7. Advanced Accountancy: R.L.GuptaandM.Radhaswamy,SChand.
8. Advanced Accountancy:Chakraborthy,Vikas Publishers
9. CorporateAccounting: S.N.Maheswari,S.K. Maheswari,VikasPublishingHouse.
10. AdvancedAccounts: M.C. Shukla, T.S.Grewal, S.C. Gupta,S. Chand &Company
11. CorporateAccounting:UmamaheswaraRao, KalyaniPublishers
12. CorporateAccounting:DrChandaSrinivas,SevenHills International Publishers,

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SEMESTER-IV

COURSE10:COSTANDMANAGEMENTACCOUNTING

Theory Credits:4 4 hrs/week

LearningObjectives:
The aim of this course is to expose the students to the basic concepts and the tools used in costaccounting.

LearningOutcomes:
Atthe endofthecourse,thestudent willableto;
Understand various costing methods and management techniques, Apply Cost and Managementaccounting methods for both manufacturing and service industry, Prepare cost sheet, quotations,andtenderstoorganizationfordifferentworks,Analyzecost-volume-profittechniquestodetermine optimal managerial decisions, Compare and contrast the financial statements of firmsandinterprettheresultsandPrepareanalysisofvariousspecialdecisions,usingrelevantmanagementtechniques.

Unit1:Introduction: CostAccounting:Definition–Features–Objectives–Functions–Scope – Advantages and Limitations - Management Accounting: Features – Objectives – Functions – ElementsofCost-Preparation ofCost Sheet (includingproblems)

Unit 2: Material and Labour Cost: Techniques of Inventory Control – Valuation of MaterialIssues: FIFO - LIFO - Simple and Weighted Average Methods. Labour: Direct and IndirectLabour Cost – Methods of Payment of Wages- Incentive Schemes -Time Rate Method, PieceRateMethod, Halsey,Rowan Methods andTaylorMethods only(including problems)

Unit 3: Job Costing and Batch Costing: Definition and Features of Job Costing – EconomicBatch Quantity (EBQ) – Preparation of Job Cost Sheet – Problems on Job Cost Sheet and BatchCosting(includingproblems)

Unit 4: Financial Statement Analysis and Interpretation: Financial Statements - Features,Limitations.Need,Meaning,Objectives,andProcessofFinancialStatementAnalysis-ComparativeAnalysis –Common SizeAnalysisand TrendAnalysis(includingproblems)

Unit 5: Marginal Costing: Meaning and Features of Marginal Costing – Contribution – ProfitVolume Ratio- Break Even Point – Margin of Safety – Estimation of Profit and Estimation ofSales(includingproblems)

Activities:

- Debateonmethodsofpaymentsofwages

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- Seminars
- ProblemSolvingExercises
- Seminaronneedandimportanceoffinancialstatementanalysis
- Graphsshowingthebreakevenpointanalysis
- Identificationofelementsof costin servicessector byVisitinganyservicefirm
- Costestimation forthe makingofaproposed product
- Listingofindustries locatedinyourareaandmethods ofcostingadopted bythem
- Collectionoffinancialstatementsofanytwo organizationfortwoyearsandprepareacommonSizeStatements
- Collectionofcostsheet andpro-formaofquotation
- Invited Lecturesandpresentationsonrelatedtopics.
- Examinations(Scheduledandsurprisetests)

ReferenceBooks:

1. S.P.JainandK.L.Narang– AdvancedCostAccounting,KalyaniPublishers.
2. M.N.Arora–AtestbookofCostAccounting,VikasPublishingHousePvt.Ltd.
3. S.P. Iyengar–CostAccounting,SultanChand &Sons.
4. Nigam &Sharma–CostAccountingPrinciplesandApplications,S.Chand&Sons.
5. S.N.Maheswari–PrinciplesofManagementAccounting,SultanChand &Sons.
6. I.M.Pandey–ManagementAccounting,VikasPublishingHousePvt.Ltd.
7. Sharma&ShashiGupta –ManagementAccounting,KalyaniPublishers.
8. Murthy&Guruswamy– Management Accounting,TataMcGrawHill, New Delhi.
9. S.P.Gupta–ManagementAccounting,S.ChandPublishing,NewDelhi.
10. UmamaheswaraRao andRanganath,CostAccounting,KalyaniPublishers.
11. DrVMuraliKrishna –CostAccounting,SevenHills InternationalPublishers.

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SEMESTER-

IVCOURSE11:AUDITIN

G

Theory Credits:4 4hrs/week

LearningObjectives:
This course aims at imparting knowledge about the principles and methods of auditing and theirapplication

LearningOutcomes:
Atthe endofthecourse,thestudent willableto;
Understanding the meaning and necessity of audit in modern era, Comprehend the role of auditorinavoidingthecorporatefrauds,Identifythestepsinvolvedinperformingauditprocess,Determine the appropriate audit report for a given audit situation, Apply auditing practices todifferent types of business entities and Plan an audit by considering concepts of evidence, riskand materiality

Unit 1: Introduction: Meaning – Objectives – Importance of Auditing – Characteristics - BookKeepingvs Auditing-AccountingvsAuditing–RoleofAuditor inCheckingCorporate Frauds.

Unit 2: Types of Audit: Based on Ownership, Time and Objective - Independent, Financial,Internal,Cost, Tax, Government, Secretarial Audits

Unit 3: Planning of Audit: Steps to be taken at the Commencement of a New Audit – AuditProgramme - Audit Note Book– Audit Working Papers - Audit Evidence - Internal Check,InternalAudit andInternal Control.

Unit 4: Vouching and Investigation: Definition and Importance of Vouching – Objectives ofVouching-VouchingofCashandTradingTransactions–Investigation-Auditingvs.Investigation

Unit 5: Company Audit and Auditors Report: Auditor's Qualifications – Appointment andReappointment – Rights, Duties, Liabilities and Disqualifications - Audit Report: Contents – Preparation-Relevant Provisions of Companies Act, 2013.

Activities:
- Seminars
- Visittheauditfirms
- Visit an audit firm; write about the procedure followed by them in Auditing the books ofaccountsofafirm.
- Guest lecturebyan auditor
- Collecttheinformation about typesofaudit conductedin anyoneOrganization
- Collectionofauditreports

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- GroupDiscussions
- Draftan auditprogram.
- Quiz programsonsometopics
- Assignmentsincludingtechnicalassignmentslikeworkingwithauditcompaniesforobservation
- Internshipwithanaudit firm.
- Invited Lecturesandpresentationsonrelatedtopicswithqualifiedauditors

ReferenceBooks:

1. S.Vengadamani,"PracticalAuditing",MarghamPublications,Chennai.
2. Ghatalia,"PrinciplesofAuditing", AlliedPublishersPvt.Ltd.,NewDelhi.
3. PradeeshKumar,BaldevSachdeva&JagwantSingh,"AuditingTheoryandPractice,KalyaniPublications
4. N.D.Kapoor,"Auditing",SChand,NewDelhi.
5. R.G.Saxena,"PrinciplesandPracticeofAuditing", HimalayaPublishingHouseNewDelhi
6. JagadeshPrakesh,"PrinciplesandPracticesofAuditing",KalyaniPublications
7. KamalGuptaand AshokGupta,"FundamentalsofAuditing",TataMcGrawHill
8. B.N.Tondan, "PracticalAuditing",S.Chand,NewDelhi.
9. KJVijaya Lakshmi&ASRoopa,Auditing,SevenHillsInternationalPublishers.

SEMESTER-V

COURSE12:ADVERTISINGANDMEDIAPLANNING

Theory Credits:4 4 hrs/week

LearningObjectives:
Theobjectiveof thispaper is to helpstudents to acquireknowledgeon advertisingandmediaplanningand toacquireskills increatingand developingadvertisements.

LearningOutcomes:
Atthe successfulcompletion ofthecoursestudents areableto:
Understand the role of advertising in business environment and understand the legal and ethicalissues in advertising. Acquire skills in creating and developing advertisements and understandup-to-date advances in the current media industry. Acquire the necessary skills for planning andadvertisingmedia campaign.

Unit 1: Introduction: Advertising- Nature and Scope- Functions - Impact on Social, Ethical andEconomicalAspects-ItsSignificance–AdvertisingasaMarketingToolandProcessforPromotionof Business Development-Criticism onadvertising

Unit 2: Strategies of Advertisements: Types of Advertising Agencies and their Strategies inCreating Advertisements - Objectives - Approach - Campaigning Process - Role of AdvertisingStandardCouncil ofIndia(ASCI) -DAGMARapproach

Unit 3: Process of Advertisement: Creativeness and Communication of Advertising – CreativeThinking – Process – Appeals – Copy Writing - Issues in Creation of Copy Testing – SloganElementsof Design andPrinciples of Design

Unit : Media Planning: Advertising Media - Role of Media - Types of Media - Print Media - Electronic Media and other Media - Advantages and Disadvantages – Media Planning - SelectionofMedia.

Unit 5: AnalysisofMarket Media: Media Strategy – Market Analysis-Media Choices-Influencing Factors - Target, Nature, Timing, Frequency, Languages and Geographical Issues -CaseStudies

Activities:

- Students shall individually choose a local or regional advertising agency, visit, study it'sprocesses, strategies, business aspects etc. and has to submit his/her Report not exceeding10pages in thegiven format to theteacher.

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- MaxmarksforFieldwork/Project workReport:05.
- Unittests(IE).
- Surveyonexistingproductsadvertisements
- Creationofadvertisingonseveralproducts
- InvitedLectures
- Handson experiencewith thehelp offield experts
- Debates,Seminars, GroupDiscussions,Quiz,etc.
- Assignments,Casestudies,Compilationofpapercuttings,Preparationofrelatedvideos,Class exhibitions

ReferenceBooks:

1. Bhatia.K.Tej -AdvertisingandMarketinginRuralIndia-McMillan India
2. GhosalSubhash-Makingof Advertising -Mc Millan India
3. JethWaneyJaishri&JainShruti-AdvertisingManagement -Oxford universityPress
4. AdvertisingMediaPlanning,SeventhEditionPaperback– byRogerBaron(Author),JackSissors(Author)
5. MediaPlanningandBuyingin 21st Century–RonaldDGeskey
6. MediaPlanningandBuying:PrinciplesandPracticeinthe IndianContext–ArpitaMenon
7. PublicationsofIndianInstituteofMassCommunications
8. AdvertisingandSalesmanship.P.Saravanavel, MarghamPublications
9. Publicationsof ASCI

SEMESTER-

VCOURSE12:STOCKMARKETS

Theory Credits:4 4 hrs/week

LearningObjectives:
The objective of this paper is to help students to acquire knowledge on concept of FinancialMarket and ability to understand the terminologies associated with the field of Financial Marketand control along with their relevance. To impart awareness on Primary and Secondary Market,StockExchange, SEBIetc.

LearningOutcomes:
Bythe completionofthe course, the studentswillbeable to
Expose to theory and functions of the Share Market in Financial Sector as job careers and 2.Studythefunctioningofcapitalmarketsandcreateawarenessamongthepublic.Acquireknowledge on operations of Share Market and Research skills and involve in activities of MutualFunds and stock market firms. Enhance their skills by practicing in preparation of accountingstatements

Unit 1: Introduction,: Nature, Scope and basics of stock market**,** Need of Investment-Short andLong Term investment- Money market Vs Capital Market-Primary Market-Secondary Market -TypesofInvestors-Speculators, Hedgers, Arbitragers.

Unit 2: Capital Markets: Definition, Participants of Capital Market, Participants of PrimaryMarket, issues of Equity Shares , Preference Shares and Debentures .Types ofMutual Funds.SecondaryMarket-StockExchange-National Stock Exchangeof India.

Unit 3:Financial Intermediaries: Depositories -Buy Back of Shares-- Forward Contract andFutureContract-differences –Participants in FutureContract-ClearingofMechanism.

Unit4:StockIndices: Indexanditstypes-SENSEX-CalculationMethodology-TypesofClearingMembers.

Unit5:RegulatoryMechanism:SecurityandExchangeBoardofIndia(SEBI)-Powers,functions-OvertheCounterExchange(OTCE) ofIndia-Functionsand Mechanism.

Activities:

- Students shall **i**ndividually study the work of stock market professionals and agencies andmakeobservations and Report to theteacher.
- Trainingof students bya related field expert.

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- Assignments(includingtechnicalassignmentslikeidentifyingtheinvestorsandtheiractivitiesi n sharemarkets
- Seminars,Conferences,discussionsbyinvitingconcernedinstitutions
- VisitstolocalInvestment Institutions,offices,
- Invitedlecturesandpresentationsonrelatedtopicsbyfieldexperts.

ReferenceBooks:

1. I.M.Pandey.,Financial Management,VikasPublishingHouse
2. PrasannaChandra,FincialManagementTaTaMcGrawHill
3. Bhole.L.M.Financial MarketsandInstitutions,TataMcGrawHillPublishingHouse
4. KhanMY,JainPK,FinancialManagement,TataMcGrawHill
5. KishoreRavi.M.,FinancialManagement,TaxmanPublication

SEMESTER-V

COURSE13:CUSTOMERRELATIONSHIPMANAGEMENT

Theory Credits:4 4 hrs/week

Learningobjectives:
The course focuses on helping in recognizing the key elements need to be addressed and reflectsthe need to create an integrated cross-functional focus - one that emphasizes retaining as well aswinningcustomers CourseOutcomes:

LearningOutcomes:
Onsuccessfulcompletionofthiscourse, thestudentswillbeable:
To be aware of the nuances of customer relationship and to analyze the CRM link with the otheraspects of marketing.To impart the basic knowledge of the Role of CRM in increasing the salesofthecompanyandtomakethestudentsawareofthedifferentCRMmodelsinserviceindustry.Tom akethestudents awareandanalyzethe different issuesin CRM.

Unit1: Introduction to CRM and eCRM: Definition, Factors responsible for CRM growth,CRMprocess,frameworkofCRM,BenefitsofCRM,TypesofCRM,CRMtechnologycompone nts,Differencebetween CRM andeCRM, features of eCRM.

Unit 2: Sales Force Automations (SFA): Definition and need of SFA, barriers to successfulSFAfunctionality,technologicalaspectofSFA,datasynchronization,flexibilityandperfor mance,reportingtools.

Unit3:EnterpriseMarketingAutomation(EMA): ComponentsofEMA,marketingcampaign,camp aignplanningandmanagement,businessanalytictools,EMAcomponents(promotions,events loyaltyand retentionprograms), response management.

Unit4:Callcenter: Meaning,customerinteraction,thefunctionality,technologicalimplementation, what is ACD (Automatic Call Distribution), IVR (Interactive Voice Response),CTI (Computer Telephony Integration), web enabling the call center, automated intelligent callrouting,logging &monitoring.

Unit 5: Implementing CRM: Pre implementation, kick off meeting, requirements gathering,prototyping and detailed proposal generation, development of customization, Power use beta testand data import,training, roll out and system hand off, ongoing support, systemoptimization,andfollow up.

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Activities:

- Trainingof students bya related field expert.
- Assignmentsincludingtechnicalassignments like ERP– SAPCRM.
- Seminars,Conferences,Discussionsbyinvitingconcernedinstitutions
- Field Visit tonearbyfirmsto studythe CRM.
- Invitedlecturesandpresentationsonrelatedtopics,eachstudenthastovisitatleastonefirmdealt with CRM and present a report.
- Showhowtointegratetheinternetcustomerself-service forB2BandB2Cchannels.
- ShowhowtorunCRManalyticsthroughembeddedcompetitors'analysisinopportunitymanagement.
- Quiz andClassseminars
- Casestudies
- Groupdiscussions
- Debates

ReferenceBooks:

1. CRMatthespeedof light byPaulGreenberg,YMH2nd edition.
2. CustomerRelationshipManagementbyVKumar,WernerJReinartz,WILRYIndiaedition.
3. CustomerRelationshipManagementbyKristin Andersonand CarolKerr, TM.
4. CustomerRelationshipManagement:Concepts&Application,AlokKumar,ChabbiSinha&Rakesh Kumar,Biztantra, Delhi, 2007
5. CustomerRelationshipManagement-AStep-by-StepApproach,HPeeruMohamed,ASagadevan,, Vikas PublishingHousePvt.Ltd., Delhi, 2008
6. ABusinessGuidetoCustomerRelationshipManagement,JillDyche:TheCRMHandbook:,Pearson Education, 2002.
7. SecretsofCustomerRelationshipManagement, EdPeelen,CustomerRelationshipManagement,,Pearson Education,2005. 3.BarnesJames G:, McGrawHill, 2001.

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SEMESTER-V

COURSE 13:STOCKMARKETSANALYSIS

Theory Credits:4 4 hrs/week

LearningObjectives:
The objective of this paper is to help students to acquire knowledge on functioning of localCapitalmarkets.To impart skillsbyinvolvingactivitiesof ShareMarketanalysis.

LearningOutcomes:
Bythe completion ofthecourse, the studentsareable to
Expose to theory and functions of the monetary and Financial Sector as job careers and Study thefunctioning of local Capital markets. Createawareness among the public by giving reportingafteranalysisandAcquireknowledgeonoperationsofShareMarketandResearchskills.Enhancetheir skills byinvolvingactivities ofShareMarketanalysis

Unit 1: Introduction, Nature, Scope and basics of stock market analysis: Introduction ofInvestments-NeedofSecurity Analysis-Typesofanalysis-FundamentalAnalysis,TechnicalAnalysis,QuantityAnalysis.

Unit 2: Fundamental Analysis: Based on Company's Records and Performance-EPS Ratio-Priceto SalesRation-P/Earnings Ratio, P/EquityRatio, ROI,D/P Ratio- IntrinsicValue-

Unit3:TechnicalAnalysis: BasedonSharePriceMovementandMarketTrends-BullishPattern-Bearishpattern

Unit4:**QuantityAnalysis:**BasedondataforspecialResearchpurpose(Descriptive,Correlation,ComparativeandExperimental)bypreparingquestionnaire,observation,focusgroups and interviews – DowTheory

Unit 5: **Mutual Funds:** Importance and the role of Mutual Fund –Types of Mutual Funds-Various schemes in India- Growth Fund, Income Fund, Growth and Income Fund, Tax planningschemes,other categories, AssetManagement MutualFunds-itsmethodof analysis's

Activities:

- StudentsshallindividuallystudythedataofselectedinstitutionsandtheirperformancebyanalyzingthestatementslearningfrompracticalexperiencesfromCharted Accountantsand Cost Accountants and Report tothe teacher.
- Trainingof students bya related field expert.

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- Assignments(includingtechnicalassignmentslikeidentifyingsourcesoflocalfinancialinstitutions,
- Seminars,Conferences,discussionsbyinvitingconcernedinstitutions
- VisitstolocalFinancialInstitutionslikeHDFCsecurities,ICICIDirectSecuritiesRelianceSecurities etc.
- Invitedlecturesandpresentationsonrelatedtopicsbyfieldexperts.

ReferenceBooks:

1. Khan.M.Y.FinancialManagement,VikasPublishingHouse
2. Bhole.L.M.Financial MarketsandInstitutions,TataMcGrawHillPublishingHouse
3. PrasannaChandra,InvestmentAnalysisandPortfolioManagement,TataMcGrawHill
4. DamodharanAswath, Valuation: Security Analysis for Investment and corporateFinance.,Johnwiely,Newyork
5. Francis.J.C.,InvestmentAnalysisandManagement,TataMcGrawHill

SEMESTER-V

COURSE14:DIGITALMARKETING

Theory Credits:4 4 hrs/week

LearningObjectives:
The objective of this paper is to help students to acquire knowledge on digital marketing andvarioussocialmediamarketing..Toimpartskillsby involvingstudentsonlineandemailmarketing.

LearningOutcomes
Uponsuccessfulcompletionofthecoursestudentswillbeableto;
AnalyzeonlineMicroandMacroEnvironmentandDesignandcreatewebsite.Discusssearchenginemarketingand Create blogs, videos, and share

Unit1:Introduction: Digitalmarketing:Meaning–importance–traditionalonlinemarketingvsdigitalmarketing–onlinemarketplaceanalysisMicroEnvironment–OnlineMacroEnvironment-trends indigitalmarketing– competitiveanalysis.

Unit 2: Web site planning and creation : Web Site: meaning – objectives – components ofwebsite-websitecreation–incorporationofdesignand–addingcontent,installingandactivatingplugins.

Unit 3: Search Engine Optimization (SEO) :SEO: Meaning – History and growth of SEO – Importance of Search Engine - On page Optimization – off page optimization – Role of SearchEngine Operation- google Ad words – Search Engine Marketing: Campaign Creation – AdCreation,Approval andExtensions.

Unit 4: Social Media Marketing: Meaning of social media and Social Media Marketing – socialManagement tools-strategy and planning – social media network – Social Networking – videocreation and sharing – use of different social media platforms - Content creation - Blogging –GuestBlogging.

Unit5:Email marketing:
Meaning–Evolutionofemail–importanceofemailmarketing–DevelopmentandAdvancementsinemailmarketing-emailmarketingplatforms–creatingandTrackingemailers–create forms – create opt-in lists – mapping industry trends and eliminating spammessages.

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Activities:

- Students shall individually undertake an online study on any aspect such as Analysis oflocalonlineMicroandMacroEnvironmentandmakeatrendanalysisofdigitalmarketing,and to submit Report to theteacher.
- Organize short term training on Digital Marketing in collaboration with local or onlineskillproviders.
- Seminars/Conference/WorkshopsonsignificantandemergingareasinDigitalMarketing
- RealtimeworkexperiencewithDigital marketingserviceproviders.
- ArrangeforInteractionwithAreaSpecificExperts.

ReferenceBooks:

1.DigitalMarketingforDummiesby RyanDeiss&RussHenneberry,publisherJohnWileyfirstedition 2020.
2. YoutilitybyJayBaer,PublishedbyGildaMedialLCPortfolio2013,
3. EpicContent MarketingbyJoePulizzi, McGraw-Hill Education,2013
4. NewRulesofMarketingandPRbyDavidMeermanScott.Wiley,2017
5. SocialMediaMarketing All-in-one Dummiesby JanZimmerman,DeborahNg,JohnWiley&Sons.
6. Digital Marketing2020byDannyStar,IndependentlyPublished, 2019
7. *Websourcessuggestedby the concernedteacherandcollege librarianincludingreadingmaterial*.

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SEMESTER-V

COURSE14:ADVANCEDCORPORATEACCOUNTING

Theory Credits:4 4 hrs/week

LearningObjectives

The course aims to help learners to acquire conceptual knowledge of purchase of business andamalgamation ofcompanies. They able to understand the accounting procedure of liquidationandcorporate accounting procedures.

LearningOutcomes

Aftercompletingthecourse,the student shallbeable to:

Understand Corporate Accounting environment and record transactions related to Purchase ofBusiness, Amalgamation and Reconstruction. Analyze the situations of Purchase of BusinessandLiquidationandcreateformulasandcalculationsrelatingtoAmalgamation,InternalReconstructionandHoldingcompanyaccounts.AcquireskillsofAccountingProcedureofAdvancedCorporateAccountingEnvironment.

Unit 1: Purchase of Business: Meaning - Purchase Consideration - Methods for determiningPurchaseConsideration-Dischargeof PurchaseConsideration-Accounting Treatment.

Unit 2: Amalgamation of Companies: Meaning and Objectives - Provisions for AmalgamationofCompanies as perAccountingStandard14-AccountingTreatment.

Unit 3: Internal Reconstruction of Companies : Meaning - Forms of Internal Reconstruction - AlterationofShareCapital and ReductionofShareCapital-AccountingTreatment.

Unit 4: Accounts of Holding Companies: Meaning of Holding Companies and Subsidiarycompanies-ConsolidatedFinancialStatements-LegalrequirementsonConsolidation-CalculationofMinorityInterest-AccountingTreatment.

Unit 5: Liquidation: Meaning - Modes of Winding up of a Company- - Liquidator's FinalStatement of Account - Calculation of Liquidator's Remuneration - Preparation of Statement ofAffairsand DeficiencyAccount-AccountingTreatment

Activities:

- StudentsareaskedtoidentifiedrealtimesituationswithrespecttoAmalgamation,Liquidation,PurchaseConsideration and submit report..

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- Assignmentsincluding technicalassignmentslike Working withAuditCompany forObservation of Purchase Consideration and Observation of recent Amalgamations inBankingSectorand Corporate Sector
- Seminars,Conferences,discussionsbyinvitingconcernedinstitutions
- FieldVisit
- Invited Lecturesandpresentationsonrelatedtopics

ReferenceBooks:

1. Goyal, Bhushan Kumar.CorporateAccounting. Taxmann,NewDelhi
2. Kumar,Alok.CorporateAccounting.KitabMahal
3. Monga,J.R.FundamentalsofCorporateAccounting.MayurPaperBacks,NewDelhi
4. Sah,RajKumar,ConceptBuildingApproachtoCorporateAccounting,Cengage
5. SehgalAshok&SehgalDeepak.CorporateAccounting
6. TulsianP.C.CorporateAccounting.SChand &Co.New Delhi
7. *https://thebookee.net/ad/advanced-corporate-accounting-and-accounting-standards*
8. WebresourcessuggestedbytheTeacherconcernedandtheCollegeLibrarianincludingreadin gmaterial

SEMESTER-V

COURSE15:SERVICEMARKETING

Theory Credits:4 4 hrs/week

LearningObjectives:
The objective of this paper is to help students to acquire knowledge on service marketing andcustomer responses in services marketing. To familiarize the students on marketing strategies invariousservices marketing.

LearningOutcomes
Uponsuccessfulcompletionofthe coursethestudentwill beableto;
Discuss the reasons for growth of service sector and examine the marketing strategies of BankingServices, insurance and education services. Review conflict handling and customer Responses inservices marketing. Describe segmentation strategies in service marketing and Suggest measurestoimproveservices qualityand theirservicedelivery.

Unit 1: Introduction: Nature and scope of services, characteristics of services, classification ofservices – Need for service marketing -Reasons for the growth of services sector. Marketing ofBankingServices-MarketinginInsuranceSector- MarketingofEducation Services.

Unit2:ConsumerBehaviorinServicesMarketing: CustomerExpectationsonServices-Factors influencing customer expectation of services. - Service costs experienced by Consumer,the Role of customer in Service Delivery, Conflict handling in Services, Customer Responses inServices,Concept of Customer Delight.

Unit3:ServicesMarketSegmentation: ServicesMarketSegmentation:-Marketsegmentation -Basis&Needforsegmentationofservices,basesofsegmentationservices,segmentationstrategiesin servicemarketing.

Unit 4: Customer Defined Service Standards: Customer Defined Service Standards - Hard andSoft, Concept of Service Leadership and Service Vision -Meeting Customer Defined ServiceStandards -Service Flexibility Versus Standards - Strategies to Match Capacity and Demand -managingDemandand Supplyof Service.

Unit5:ServiceDevelopmentandQualityImprovement:
Service Development – need, importance and Types of New Services - stages in development ofnew services, service Quality Dimensions - Service Quality Measurement and Service Mapping,ImprovingServiceQualityand Service Delivery,ServiceFailure andRecovery.

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Activities:

- Students shall individually take up a study on marketing strategies adopted by any of theservice providers like Banking, Insurance, Telecom companies, (BSNL, Reliance Jio,Airtel, etc.) any other sector like electric household appliances, hospitals, hotels etc.Assess Customer expectations and Customer satisfaction feedback on services providedandhas to submit Report to theteacher.
- Organize short term training on specific technical skills in collaboration with ComputerDepartment or skill training institution (Government or Non-Government Organization).Like Zoho,Freshbook,MS Excel….
- Seminars/Conference/Workshopsonemergingtrendsinservicemarketing
- Realtimeworkexperiencewithservicemarketingproviders
- ArrangeforInteractionwithAreaSpecificExperts.

ReferenceBooks:

1. JohnE.G.Bateson,K.DouglasHoffman:ServicesMarketing,CengageLearning,4e,2015publication

2. VinnieJauhari,KirtiDutta:ServicesMarketing:OperationsandManagement,OxfordUniversityPress, 2014.

3. ValarieA.ZeithamlandMaryJo-Bitner:ServicesMarketing–IntegratingCustomerFocusAcrossThe Firm, Tata McGraw HillPublishingCompanyLtd., 6e, 2013.

4. NimitChowdhary,MonikaChowdhary,TextbookofMarketingOfServices:TheIndianExperience, Macmillan,2013.

5. K.RamaMohanaRao, ServicesMarketing,Pearson,2e,2011.

6. Dr.K.Karunakaran,ServiceMarketing(TextandCasesinIndianContext),HimalayaPublications.

7. *Websourcessuggestedbytheconcernedteacherandcollegelibrarianincludingreadingmaterial*.

SEMESTER-V

COURSE 15:SOFTWARESOLUTIONSTOACCOUNTING

Theory Credits:4 4 hrs/week

LearningObjectives:
The objective of this paper is to help students to acquire knowledge on the major accountingsoftwareandto impartskillsofTallyanddifferent accountingsoftwarefor accountingpurpose.

CourseLearningOutcomes
Aftercompletingthecourse, thestudent shall beable to:
Understandthetechnicalenvironmentofaccountingsoftwareandhighlightthemajoraccounting software inIndia.Apply basicsof accounting software into business firms foraccountingtransactions.UnderstandthevariousversionsofTallyandothersoftwareandintegratethe conceptofdifferentaccountingsoftwareforaccountingpurpose.Designnewapproachesforuseof accountingsoftwareenvironment.

Unit1:ComputerizedAccounting: MicrosoftExcelSpreadSheet-FunctionsinExcel-Preparationof Accounts, StatementsandBudgets usingMSExcel-Analysisand Interpretation.

Unit 2: Introduction to Leading Accounting Software: - Busy - Marg – Quick Books - ZohoBooks-Tally-Features and Accounting.

Unit 3: Tally ERP-9: Company Creation -Tally Startup Screen- Gateway of Tally- Create aCompany-Alter &Deletecompany-BackupandRestore-SecurityFeatures in Tally.

Unit4:Tally-AccountingMasters: Groups-CreateLedgers-Alter&Delete-InventoryMasters-CreatingStock Groups -Stock Items-Unit ofMeasurement-Alter&Delete.

Unit- 5: Tally-Voucher Entry: -Vouchers Types - Vouchers Entry - Alter and deleting SettingsPurchaseVouchers and SalesVouchersincludingTaxcomponent–Reports Generation.

Activities

- Trainingof students bya related field expert.
- Assignmentsincludingtechnical assignments likeWorkingwith Excel &Tally
- Seminars,Conferences,Discussionsbyinvitingconcernedinstitutions
- FieldVisit
- Invited lectures and presentations on related topics Each student has to visit atleast one business organization dealt with Computerized Accounting. Collectdatarelatingtothebusinesstransactions andpracticein collegecomputer lab.

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- EachstudenthastoprepareoneSystembasedaccountingduringthesemesterandsubmi t areport, to theteacher inthegiven format.

ReferenceBooks:

1. Nadhani,AshokK, TallyERP9TrainingGuide,BPBPublications
2. Tally9 in SimpleSteps, Kogent SolutionsInc.,JohnWiley&Sons.
3. Tally9.0 (English Edition), (GoogleeBook)Computer World
4. Tally.ERP 9MadeSimpleBasic Financial AccountingbyBPBPublisher.
5. TallyERP9 For RealTimeAccountingbyAvichi Krishnan
6. FundamentalsofComputers,byV.Rajaraman, PHI.
7. TallyERP 9 bookadvanced user,Swayam Publication(www.tallyerp9book.com)

SEMESTER-VII

COURSE 16:ACCOUNTING FORSPECIALINSTITUTIONS

Theory Credits:4 4 hrs/week

Courseobjective:
Students will learn relevant special institutions and their recording of expenses and incomes alsopreparationoffinal accounts.

Learningoutcomes*:*

- Tolearnhowbooks aremaintained andfinancialstatementsforeducational institutions
- Tostudydifferent typesofhospitals andhowfinancial statementsdiffer.
- Tolearn theprocessrelatingto purchasesand sales ofhotels and restaurants.
- Tolearnthetopicsrelatingtofarmaccounting
- Togainknowledgeregardingthe double accountingsystemand their real timeuses.

Syllabus:

Unit1:AccountingforEducationalInstitutions:
Meaning-BookstobemaintainedSourcesandExpenditure-AnnualStatementofAccounts.

Unit2:Accounting forHospitals:
Meaning-TypesofHospitals –SourcesandExpenditure-Funds-PreparationofFinalAccounts.

Unit3:AccountingforHotelsandRestaurants:
Objectives - Purchases-Sales-Some Special Items Relating to Hotel Business-Apportionment ofCommonExpenses to various departments.

Unit4:FarmAccounting:
Objectives-Features-How Transactions are recorded-Usual Heads of expenses and Incomes ofsomefarms.

Unit5:DoubleAccountingSystem(ElectricityCompanyAccounts):
Meaning -Advantages and Disadvantages of Double Accounting System- Difference betweenSingle Account and Double Accounting System-Difference between Double Entry System andDoubleAccountingSystem-Replacementofanasset-AccountsofElectricityCcompanies.

Practicalcomponents*:*

- Studentsshouldgetknowledgeabouttheexpensesandbooksmaintainedineducationalinstitutio nsbyobservingdifferent departments in their institutions.

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- Students should visit hotels and interact with the managers regarding the special itemsrelatingto businessand statements prepared.
- By management cooperation students should visit hospitals also search for the expensesandbooks of specialinstitutions from other booksand search engines.
- All the students should form in groups and provide a presentation with images and videosof their visit in such hospital or institution or hotels so that other students also able tolearntheview.

ReferenceBooks*:*

1. Advanced Accountancy-S.N.Maheswari,VikasPublishingHousePvt. Ltd.
2. PracticeIn Accountancy- Basu &Das,Ravindralibrary
3. AdvancedAccountancy-ArulanandamandRaman,HimalayaPublication
4. Advanced Accountancy-Vol.2R.L.GupaandRadhaswamy,SultanChand&Co
5. Advanced Accountancy-SPJainandKL.Narang,KalyaniPublications
6. Advanced Accountancy- Shukla&Grewal;S.ChandPublications.

SEMESTER-VII

COURSE16:FINANCIALINSTITUTIONSANDMARKETS

Theory Credits:4 4 hrs/week

Courseobjectives:

The main objective of this course is to familiarize the student with the financial institutions,markets, and regulations. The study of this course helps students to learn the role of differentinternational financial institutions in the economic development of the country. Further the studyof the course enables the students to learn the role of primary market, capital market and moneymarketin the economicdevelopment of the nation.

Learningoutcomes:

- Tofamiliarizeaboutfinancialinstitutions,marketsandregulations
- TolearnaboutvariousIndianfinancialinstitutionsandregulatoryframework
- TounderstandaboutInternationalfinancialinstitutions
- Toanalysecapitalmarketandtheirevolutionand developments
- Toillustratemoneymarketand derivativemarket

Syllabus:

Unit1:FunctionsofFinancialSystem:

An overview of Indian Financial System – Constituents of Indian Financial System – Role andfunctions of participants in the Financial markets – Factors impacting the dynamics of Financialsystem(Theory).

Unit2:FinancialInstitutions:IndianBankingSystem:

An overview – Recent Developments; Banking Institutions – Classification of Banks. Role ofReserveBankofIndia,NABARD,Regulatoryissuesofbankinginstitutions:Non-BankingInstitutions – Role of NBFCs in the economic development – Types of NBFCs – RegulatoryFrameworkofNBFCs.

Unit3:InternationalFinancialInstitutions:

Overview of Global Financial Institutions – Role of International Bank for Reconstruction andDevelopment (IBRD) – International Monetary Fund (IMF), Asian Development Bank (ADB),andEuropeanCentralBank(ECB)–BankforInternationalSettlement(BIS)–NewDevelopmentBank (NDB)formerlyreferredto asthe BRICS DevelopmentBank.

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Unit4:CapitalMarket:

Evolution and development of Capital Market, Future trends, Components of Capital Markets – Primary market and Secondary market, Equity and debt, Domestic Institutions and Foreigninstitutions, Role of Stock Exchange Depositories; Regulatory framework – Role of SEBI, RBI,Ministryof Finance,IRDA.

Unit5:IntroductoryConcepts:

MoneyMarket,Importance,CompositionandConstituents,InstrumentsofMoneyMarket;Commodity Markets–Structure,Operations,Trends;DerivativesMarket–Structure,Operations,Trends; Foreign ExchangeMarket– Structure,Operations, Trends.

PracticalComponents:

- Studentsshouldlearntheconceptof Indianfinancialsystemandrole,functionsofparticipantsin the financial markets.
- Allthestudentsshouldlearntheclassificationofbanksandtheroleof ReservebankofIndia,NAB ARD regardingthe regulatoryissues.
- Studentsshouldformintoteamsandpreparepresentations onthetopicsinthesyllabusandprovide them asassignments or seminars
- Allthestudentsshouldmaketeamsforthegroupdiscussionsondifferentinternationalfinancialin stitutions.
- Studentsshouldanalysetheoverviewof globalfinancialinstitutions
- Allstudentsshouldlearnevolutionanddevelopmentofcapitalmarket.

ReferenceBooks

1. L.M.Bhole– Financial MarketandInstitutions
2. M.Y.Khan–IndianFinancialSystem
3. VasantDesai–DevelopmentBanking–Issues andOptions,HimalayaPub.
4. M.Y.Khan–IndustrialFinance,TataMcGrawHillPublishers.
5. L.C.Gupta–TheChangingStructureofIndustrialFinanceinIndia,OxfordUniversityPress
6. Avadhani–Marketingof FinancialServices,HimalayaPublishingHouse.

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SEMESTER-VII

COURSE17:INDIAN ACCOUNTINGSTANDARDS

Theory Credits:4 4 hrs/week

Courseobjective:
Toenablethestudentstohavethoroughknowledgeinaccountingtheoryandaccountingstandardsforaccounting profession.

Learningoutcomes:

- Tounderstandtheobjectives, significance,advantages,disadvantages ofaccountingstandards.
- Toacquiretheconceptualknowledgeofprocedureforissuingaccountingstandardsandaccountingstandards board, scopeandfunctions
- Toanalysevarious accountingstandards and their disclosurerequirements.
- FamiliarizeandunderstandtheInternationalFinancialReportingStandards(IASorIFRS)andtheirapplication to thecompanies who usethem.
- Evaluatevariousaccountingstandards

Syllabus:

Unit1:Introduction:
Accounting Standards – Meaning - Objectives – Significance - Advantages and Disadvantages – Procedure for issue of Accounting Standards by ICAI– Scope – Accounting Standards Board – Formation,ScopeandFunction–Complianceofaccountingstandards-
IndianAccountingStandardsissued so far(list only).

Unit 2: Conceptual Framework for preparation and presentation of financial statements: Meaning, Purpose and status of framework – Components, Objectives of financial statements –Qualitative characteristics of financial statements – Elements of financial statements and theirmeasurement-Fundamental accountingassumptions.

Unit3:AccountingStandards-I:
AS-1: Disclosure of Accounting policies – AS-2: Valuation of inventories –AS-3: Cash flowstatement – AS-4: Contingencies in balance sheet –AS-5: Net profit or loss, prior period itemsandchanges – AS-7: Construction Contracts (Theoryonly)

Unit4:AccountingStandards-II:
AS-9: Revenue Recognition – AS 10: Accounting for Fixed assets AS-11: Effects of changes inforeign exchange rates- AS-12: Accounting for government grants – AS-13: Accounting forinvestments– AS-14: Accountingfor Amalgamation. (Theoryonly)

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Unit5:AccountingStandards-III:

AS-16: Borrowing costs **-** AS-19: Leases – AS-20: Earning per share - AS-26: Intangible assets – AS-29: Provisions, Contingent liabilities and assets - International Financial Reporting Standards(IFRS):Meaning-Objectives – Procedure–Challenges. (Theoryonly)

Practicalcomponents:

- Allstudentsaredividedintogroups.Eachgroupshouldpreparequestionsonparticularaccountingstandards andprovide them toother groups forsolving.
- Studentshave toreadtheprovisionsof relating toIndianaccountingstandards comparingwithaccountingstandards
- AllstudentsshouldgetfamiliarwithMCAwebsiteandgainresearchaboutthestructureofaccountingstandard formulation.
- Studentsshouldformteamsandprovideseminarsonthetopicandprovidepresentationsforcommunication skills.

ReferenceBooks:

1. Taxman'sStudents'GuidetoAccountingStandards,D.S.Rawat,TaxmanPublications.
2. Tulsian'sSelectAccountingStandards,CA(Dr)P.C.Tulsian,S.ChandPublications
3. AccountingandAuditingStandards,Dr.M.SrinivasuluandOthers,HimalayaPublishingHouse
4. CompendiumofStatementsandStandardsonAccounting,TheInstituteofCharteredAccountantsofIndia, New Delhi.
5. T.P.Ghosh,AccountingStandardsandCorporateAccountingPractices,TaxmanPublications.

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SEMESTER-VII

COURSE17:FINANCIALPLANNING

Theory Credits:4 4 hrs/week

Courseobjective:

To enable the student to understand various components of financial planning and to get morerewardsusingrisk returntradeoff.

Learningoutcomes:

- Tolearnabout personalfinancial planning,concept oftimevalue ofmoney
- Identifyingandgainknowledgeofdifferentrisksandtheirmeasurement
- Familiarizeinvestmentstrategies
- Evaluationof problems regardingretirement planningalso know thekeyterms
- Gainknowledgeofincometaxheadsand differentiatetheincomeintodifferent heads.

Syllabus:

Unit1:Basics ofPersonal FinancialPlanning:

Definition, Importance and process of financial planning, Concept of time value of money insingleand series.

Unit2:ManagingInvestmentRisk:

Types of risks, measurement and management of risks and financial statements**. MeasuringInvestmentReturns**:RiskandReturntrade-off,ShorttermandlongtermcapitalGains.Choosingthe various sourceofcreditandcredit alternatives.

Unit3:InvestmentStrategies:

Various Strategies and asset allocation .Evaluating investment in various stocks and VariousLoansand theirusage.

Unit4:RetirementPlanning:

Process, Annuities and its types, Asset allocation & diversification and concept of mortgage anditstypes-Reversemortgage.

Unit5:Tax andEstatePlanning:

Variousheadsofincomes,ExemptionsinIncometaxapplicabletovariouscategories.Conceptofwealth Tax. EstatePlanningneed and creationof Will and variousformats.

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Practicalcomponents:

- Studentsshouldlearntheprocessoffinancialplanning,conceptoftimevalueofmoneyinsingle and series.
- Allthestudentsshouldlearnthetypesofrisksandhowtomeasuringtheinvestmentreturns.
- Studentsshouldformintoteamsandpreparepresentationsonthetopicsinthesyllabusandprovid e them asassignments or seminars
- Allthestudentsshouldmaketeamsshoulddiscussoninvestmentstrategiesinthepresentenviron ment.
- Studentsshouldanalysetheretirementplanning.

ReferenceBooks:

1. WorkbookofCPFAofNSEinIndianversionisavailableOnthefollowinglink:http://nseindia.co m/content/ncfm/ncfm_cpfa_workbook.pdf.
2. JackRKapoor,LesRDlabay,RobertJHughes,personalfinance,McGraw-Hill/Irwin;Edition 2005.
3. JeffMadura,PersonalFinancewithFinancialPlanningSoftwareAddisonWesley;Edition 2006.
4. Joehnk,Gitman,PersonalFinanceAUser'sPerspective,CengageLearning,Edition2009.

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SEMESTER-VII

COURSE 18:BANKINGANDINSURANCECOMPANYACCOUNTS

Theory Credits:4 4 hrs/week

Courseobjective:
Students should acquire knowledge about preparation of financial statements of banking andinsurance companies.

Learningoutcomes:

- Toacquireknowledgeforpreparationofmemorandumtradingaccountandclaimstatement
- Tofamiliarizethepointsrelates tolossofprofits.
- Tounderstandaboutlifeinsuranceandtopreparefinancialstatementsoflifeinsurancecorporation
- Tocomparelifeinsuranceandgeneralinsurance,topreparefinancialstatementsoffireandmarine insurancecompanies.
- Toequipthestudentswiththepreparationoffinancialstatementsof InsuranceandBankingcompanies

Syllabus:

Unit1:FireInsuranceClaimsI (Lossofstock):
MeaningofFire–ClaimforLossofStock–AverageClause-PreparationofMemorandum TradingAccount and claim Statement.

Unit2:FireInsurance ClaimsII(Lossof profitorConsequentialLoss):
Important points– Indemnity period, short sales, standard charges, increased cost of working,rateof gross profit– Procedure forascertainingclaim.

Unit3:AccountsofInsuranceCompaniesI:
Meaning of insurance- types of insurance- Books or registers to be maintained by insurancecompany – Terminology used in Insurance companies -Life Insurance Companies – preparationofRevenueAccount,Balancesheet and valuationBalancesheet.

Unit4:AccountsofInsuranceCompaniesII:
General Insurance –Reserve for unexpired risks – Differences between life insurance and generalinsurance-Preparationoffinalaccountswithspecialreferencetofire andmarineinsuranceonly.

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Unit5:BankAccounts:

Bank Accounts - Books and registers to be maintained by Banks- Slip system of posting -Rebate on Bills discounted - Schedule of advances - Nonperforming assets - preparation of profit&loss a/c and balancesheet.

Practicalcomponents

- Allstudentsshouldformintogroupsanddiscussaboutthedifferentadjustmentsandmodelsof problems andhow to solvethem.
- Detailedresearchregardingdifferenttypesofinsurance.
- Studentsshouldreadsomepolicybondsforreferenceandwhataretheclausesaremadeandwhat areall the documents required.
- Researchforthebooksmaintainedbythebanksandthebankpoliciesregardingperformingand non-performingassets through search engines.

ReferenceBooks:

1. AdvancedAccountancy-S.N.Maheswari,VikasPublishingHousePvt. Ltd.
2. PracticeIn Accountancy- Basu &Das,Ravindralibrary
3. AdvancedAccountancy-ArulanandamandRaman-HimalayaPublication
4. Advanced Accountancy-Vol.2R.L.GupaandRadhaswamy,SultanChand&Co
5. Advanced Accountancy-SpJainAndKl.Narand,KalyaniPublications
6. AdvancedAccountancy-Shukla&Grewal,S.ChandPublications.

SEMESTER-VII

COURSE18:FINANCIALMANAGEMENT

Theory Credits:4 4 hrs/week

Courseobjective:

Finance Management is designed to expose the student to the financial issues of determining themonetary resources needed by a business, the mix of these resources, the sources and uses offunds,thebenefits, risksandcosts associated withdifferent typesofresources andfinancing.

Learningoutcomes:

- Togainbasicknowledge offinancialmanagement
- Toevaluatethe capitalbudgetingprocessand riskanalysisincapitalbudgeting
- Familiarizedifferentfinancialdecisionthathelptheorganisation
- Learntypesof dividend policiesand theirvaluation
- Knowledgeregardingworkingcapitalmanagement,usestoorganisationandvaluationofworking capital

Syllabus:

Unit1:Introduction:

Nature,ScopeandObjectivesofFinancialManagement:FunctionsofFinance-ProfitMaximizationvs.WealthMaximization–RoleofFinancialManagerinModernBusinessOrganizations – Risk -Return Tradeoff.

Unit2:**Investmentdecision:**

Capital Budgeting process – Cash Flow Estimation and measurement – Investment criterion – Methods of appraisal: Traditional Techniques and Discounted Cash Flow Methods - Capitalrationing– Risk analysisin capital budgeting.

Unit3:Financingdecisions:

Conceptofleverage–TypesofLeverages–EBIT–EPSAnalysis–CapitalStructure–Determinants - Theories – Net Income approach – Net operating income approach – Traditionalview – MM Hypothesis. Cost of Capital**:** Types of Cost of Capital - Weighted average Cost ofcapital.

Unit4:**Dividenddecisions:**

Kinds of dividends, Dividend Policy types, Dividend Theories -Walter's Model - Gordon'sModel-M-M Hypothesis-RetainedEarnings Policies-Bonus Shares.

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Unit5:Workingcapitalmanagement:

Concepts of working capital – Determinants of Working capital – Optimum level of Currentassets – Liquidity vs. Profitability – Risk – Return tangle – Estimating working capital needs – Financingstrategiesofworkingcapital–InventoryManagement–InventoryControlTechniques-Receivables Management-Cash Management.

PracticalComponents:

- Studentsshould learntheroleof financialmanager inmodern businessorganisation.
- Allthestudentsshouldlearnthemethodsofappraisalalsoriskanalysisincapitalbudgeting.
- Allstudentsshouldsolvepreviousexaminationpapersforpractice.
- Allstudentsshouldformintogroupsanddiscussaboutthedifferentadjustmentsandmodelsof problems andhow to solvethem.

ReferenceBooks

1. Brearley,RichardandMyers,Steward:PrinciplesofCorporateFinance,NewYork,McGraw Hill.
2. Soloman,Ezra,TheoryofFinancialManagement,ColumbiaPress.
3. JamesC.VanHorne,FinancialManagementandPolicy,PrenticeHallof India.
4. WestonJ.FredandBrigham,EugneF.,ManagerialFinance,DrydenPress.
5. PrasannaChandra,FinancialManagement,TataMcGrawHill.
6. Khan,M.Y.andJain,FinancialManagement,Tata McGraw Hill.
7. Pandey,1M, FinancialManagement,Delhi,Vikas PublishingHouse.
8. RaviM.Kishore:FinancialManagement,Taxman.
9. Sudhirbhat,FinancialManagement,ExcelBooks.

SEMESTER-VII

COURSE 19:ACCOUNTINGTHEORYANDFINANCIALREPORTING

Theory Credits:4 4 hrs/week

Courseobjectives*:*
By the end of the course, students will be able to explain fundamentals of accounting alsodifferent approaches of accounting theory.Learning of conceptual frame work, global initiativeinfinancial reporting andvalue added statements.

Learningoutcomes:

- Toacquireknowledgeaboutfundamentalsofaccounting,differentapproachesofaccountingtheory,accountingpostulates, concepts and principles
- Tolearnaboutconceptualframeworkoffinancialreporting,itsobjectivesandfunctions.
- Togainknowledgeaboutmanagementreportsincompanies Act,2013
- TolearnthelimitationsofConventionalfinancialstatements,methodsofaccountingforchangingprices
- Tohavethoroughinformationaboutvalueaddedstatements,benefits,marketvalueandeconomicadded shareholders.

Syllabus:

Unit1:Fundamentalsof accounting:
Meaning, Nature and significance, Classification, Evolution, Role and Users of Accounting andAccountingTheory,HistoryofAccountingThoughts.ApproachestoAccountingTheory.AccountingPostulates, Concepts and Principles. (Theoryonly)

Unit2:FinancialReporting:
Meaning - conceptual frame work - Evaluation –objectives – functions - financial reportingprocess - character stiesof financial statements – global initiative in financial reporting.(Theoryonly)

Unit3:CompaniesAct 2013:
Reporting requirements - National Financial Reporting Authority (NFRA) - Board of directors - director's report – Business Responsibility Report – corporate governance reporting – corporatesocialreasonabilityreporting. (Theoryonly)

Unit4:AccountingforPricelevelchanges:
Introduction, Limitations of Conventional Financial Statements - Methods of Accounting forChangingPrices.

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Unit5:Developmentsinfinancialreporting:
Value added statements – Advantages and Limitations -Economic Value Added, ShareholdersValue Added –uses; Market Value Added – Benefits and Limitations; Market Value Added Vs.EconomicValue Added.(Simple problems and theory)**.**

Practicalcomponents:

- Thestudentscanidentifyhistoryofaccountingandaccountingpostulateswithinaccountingtheory
- Analysetheobjectives,evaluationandfunctionsoffinancialreportingalsoglobalinitiativein financial reporting
- Students should get information regarding companies act, how the act come into forcefromvarious sources.
- Students should form groups and visit small companies and get information about thehuman resource accounting is done and gain knowledge regarding the objectives andprocessof humanresourcefromrecruitment toperformanceof an employee.

ReferenceBooks:

1. Advanced Accountancy- Vol.1&2S.N.Maheswari,VikasPublishingHousePvt.Ltd.
2. PracticeInAccountancy-Vol.1&2 Basu&Das,Ravindralibrary
3. Advanced Accountancy- Vol.1&2ArulanandamandRaman,HimalayaPublication
4. Advanced Accountancy- Vol.1&2R.L.Gupaand Radhaswamy,SultanChand&Co
5. Advanced Accountancy- Vol.1&2SpJainandKl.Narand,KalyaniPublications
6. Advanced Accountancy- Vol.1&2Shukla&GrewalS.ChandPublications.
7. Financial Reporting-M.P.VijayKumar, Snow WhitePublications
8. FinancialReporting–B.D.Chaterjee,TaxmanPublications
9. FinancialReporting-P.C.Tulsian,S.ChandPublications

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SEMESTER-VII

COURSE19:FUNDAMENTALS OFFINANCIALTECHNOLOGY

Theory Credits:4 4 hrs/week

Objectives:

- LinkDescribebankingandfinanceecosystemandtheroleofconsumersinshapingupcurrent environmentbehavioralfinancetheoriestotechnologicaladvances inbanking.
- Graspthe Fin-techPlatformandTechnology
- Waystoanalyseandevaluatewhatisdrivingtechnologyinnovation inFinance.
- Hownew technologyimpacts economies, markets, companies, and individuals

LearningOutcomes:

1. Tobeable tounderstand elements andprinciples of Fintech
2. Tobeableto understandthe basicsofCryptocurrencies.
3. Tobeableto understanddynamics ofblock chain
4. Toableunderstandthe effectofFintechinvarioussectors
5. Toableunderstandthe openbanking.

Syllabus:

Unit1:IntroductiontoFin-tech

EvolutionofFin-techacrosstheworld.ImpactofdigitaldisruptionandinnovationsbyFin-techonthe BankingandFinancial Sector

Unit2:TheTechnologywithFin-tech

Understandingtheassociatedtechnologywithrespectto Cloud,Blockchain&Cryptocurrencies,Robo Advisors,Biometrics andIoT.

Unit3:Fin-techTrends

UnderstandthekeyFin-techtrends which willdisrupttheFinancialSector.

Unit4:Fin-techaffectingdifferentsectors

LearntheeffectsofFin-techonPaymentInnovations,Health,Real-Estate,andInsuranceSector.

Unit5:OpenBankingandDigitalOnlyBanking

Introducethestudentstothetransitiontoopenbankinganddigitalonlybanking,thetechnologiesinvolve d andthe requirementforconvenienceanduserexperience.

PracticalComponents

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- StudentsshouldlearntheFin-techacrossthe worldandFin-techtrends.
- Allthestudentsshouldlearntheriskanalysisintoopenbanking anddigitalonlybanking,the technologies involved
- Studentsshouldformintoteamsandpreparepresentationsonthetopicsinthesyllabusandprovide them asassignments or seminars
- AllthestudentsshouldmaketeamsshoulddiscussonFin-techaffectingdifferentsectors..
- StudentsshouldanalysetheconceptofFinancialtechnology.

References:

1. BitcoinforNon-Mathematicians:ExploringthefoundationsofCrypto,SlavaGomzin/UniversalPublishers, USA,Latest 1 ST Edition 2020
2. TheRoboticsProcessAutomation,Handbook:AGuidetoImplementing,TomTaulli/Apress,Latest 1 ST Edition 2020

WebsiteReference:

1. https://www.ibm.com/industries/banking-financial-markets/resources/omnichannelbanking-paper/
2. https://thefinancialbrand.com/111080/evolution-future-digital-banking-baastransformation/

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SEMESTER-

VIICOURSE20:TALLYWITHGS

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Theory Credits:4 4 hrs/week

Courseobjectives:

To know about the computerized accounting and accounting software Tally and Accounting ofvariousvouchers, inventoryand GST through Tally.

Learningoutcomes:

- To introduce the students to Basic of Accounts and the usage of Tally for accountingpurpose.
- To help students to work with well- known accounting software i.e. Tally Prime. Tally isanaccountingpackagewhich is used for learningto maintain accounts.
- Studentswilllearntocreatecompany,enteraccountingvoucherentriesincludingadvance voucher entries, do reconcile bank statement, do accrual adjustments, and alsoprintfinancial statements, etc. in TallyPrimesoftware.
- Demonstrateanunderstandingofvariouspredefinedinventoryvoucherstosuitthevarious business requirements and flexibility tocreate unlimited stock items, use simpleto complex conversion units and generate invoices with the required information anddimensions.
- Demonstrateanunderstandingofhowtomaintainapayrollregister.Thishelpstounderstand how to maintain management related information, statutory forms and reportsin the prescribed formats such as: Pay Slip ,Payroll Statements, Attendance and OvertimeRegisters etc
- Develop the students use the Tally software, that helps to prepare Accounting, Payroll,Billing, Sales and Profit Analysis, Auditing Banking Inventory, Taxation such as GST,VAT,TDS, TCSetc

Syllabus:

Unit1:IntroductiontoComputerizedAccounting:

IntroductiontoComputerizedAccounting–MeaningandScope– FeaturesofComputerizedAccounting-AdvantagesandLimitationsofComputerizedAccounting– ComputerizedAccountingVSManualAccounting–AccountingSoftware– TypesofAccountingSoftware.

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Unit2:AccountingSoftwareTally:

FeaturesofTally–Tally Configuration-Tally ScreenComponents–Company Creation,AlterandDelete–Companyfeatures–Configuration–GroupCompany– CreatingandAltering GROUPA Company– Processing Transactions in Tally – Tally Groups and subGroups–GroupCreation,AlterandDelete—ManagingGroups-Ledgers– Creation,AlterandDeleteLedgers.

Unit3:AccountingVouchers:

RecordingofTransactions–VoucherTypes–PaymentVoucher–ReceiptVoucher–ContraVoucher– SalesVoucher–PurchaseVoucher–JournalVoucher–Creation,Alteration and Deletion of Vouchers–New Voucher Types–Display Vouchers–Create,AlterandDeleteForeignCurrencies– Voucherentryusingforeigncurrencies.

Unit4:AccountswithInventory:

Introductiontoinventory–InventoryMethods–UnitsofMeasurementCreation,AlterandDelete– StockGroups–Creation,Display,AlterandDeletionofStockGroups–StockItems– Create,Alter,DisplayandDeletionofStockItems–StockValuationmethods– FIFO,LIFO,Averagestocklevel,MinimumLevelandMaximumLevel– CreationofSalesorderandPurchasesOrder–RejectionInandRejectionOut–Manufacturingjournal– POSInvoice--CreationofCostCenters–CreationofGodown.

Unit5:TaxesandReportGeneration:

Enabling TDS/TCSandGST---GSTconfigurationatCompany level,Stockgrouplevelandstockitemlevel–GSTLedgerscreation–VoucherentryusingGST-- FinancialReportsinTally–TrialBalance-TradingandProfitandLossAccount–BalanceSheet– BankReconciliationStatement-StockSummaryReport–RatioAnalysis–FundsFlowStatement– GodownsummaryReport–StatutoryReports–GST,TDSReports–JobcostingusingTally,

PracticalComponents:

- Studentsshould practiceTallyvouchers andcompanycreationin tallysoftware
- Identifyingdifferenttransactionsalongwithcorrectvoucherentries,identifyingheadsofincomesand expenses also assets and liabilities.
- Practiceonlatest provisionexamples whichinclude TDSand GST
- Allstudentsshouldattendthepractical sessionstogeneratefinancialreports.

ReferenceBooks:

1. Tally,C.NellaiKannan, NelsPublications,2009,2ndEdition,NewDelhi.
2. AsokK.Nadhani, Tally.ERP 9, BPBPublications,2010,1st Edition,NewDelhi.
3. Tally9,Dr.K.Kiran Kumar,SriLaasyaPublications,2009,2nd Edition,New Delhi.

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4. ComdexTally9CourseKit–NamrataAgrawal,SanjayKumar–wiley,20091stEdition,New Delhi.
5. Tally9InSimpleSteps-KogentLearningSolutionsInc.-DreamtechPress,2009,6th Edition,New Delhi.
6. VikasGupta,ComputerandFinancialAccountingwithTally9.0,BPBPublications,2007,2nd Edition, New Delhi.

SEMESTER-VII

COURSE20:INVESTMENTMANAGEMENT

Theory Credits:4 4 hrs/week

Courseobjectives*:*

Understanddifferentinvestmentalternativesin themarket•Understandhowsecuritiesaretraded in the market • Be able to analyze and price different securities • Be able to manage aportfolio•Understand basicsin derivative

LearningOutcomes:

- Thecourseintroduces theconcepts of investment.
- Thecourseaimstogiveinvestmentplanningdecisionsandmoderninvestmentalternatives.
- Differenttopicssuchasrisks andvaluationofinvestment aretobediscussed.
- Inthis course,we will alsoexaminethetimevalue ofmoney, equityandbond valuation.
- Theother importanttopicsdiscussedinthiscourse areprimaryandsecondarymarketandfundamentalanalysis of theinvestment.

Syllabus:

Unit1:Investment:

Investment– Primary and Secondary Objectives–Investment vs. Speculation- InvestmentProcess– InvestmentInformation-Personal financialplanning–Risk Profiling.

Unit2:InvestmentRisk:

Systematic & Unsystematic risks – Calculation of risk – Probability & Non-probability risks – InvestmentReturn – Capital andRevenueReturn– CalculationofReturns.

Unit3:Investments:

Bank deposits, post office savings scheme, NBFC deposits, Gold and silver, Real Estate, Equityshares, Bonds and Government securities, Mutual funds, life insurance, Tax Savings, Derivatives&ModernInvestment alternatives.

Unit4:TimevalueofMoney:

Time value of Money – Present Value Interest Factor - Present Value Interest Factor Annuity - Future Value Interest Factor - Future Value Interest Factor Annuity – Equity Valuation – BondValuation– Yield to Maturity– Problems in Valuation of Investment.

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Unit5:Primaryvs.SecondaryMarket:

Primaryvs.SecondaryMarketFundamentalAnalysis–EconomicAnalysis–IndustryAnalysis – CompanyAnalysis –FinancialAnalysis

PracticalComponents:

- Studentsshouldlearnthebasicsofinvestmentanddifferencesbetweeninvestmentandspeculation.
- Allthestudentsshouldlearnthesystematicriskandunsystematicriskalsohowtocalculatetherisks.
- Studentsshouldformintoteamsandpreparepresentationsonthetopicsinthesyllabusandprovide them asassignments or seminars
- Allthestudents shouldmaketeamsshoulddiscusson differenttypes ofdeposits.
- Studentsshouldanalysetheconceptoftimevalue ofmoney.

ReferenceBooks

1. RustagiRP,InvestmentAnalysis&PortfolioManagement,SultanChand&Sons,NewDelhi.
2. PandianPunithavathySecurityAnalysis&PortfolioManagement,VikasPublishers,NewDelhi, 2010.
3. ChandraPrasanna,Investment&PortfolioManagement,TataMcGraw-Hill,NewDelhi,2011
4. Natarajan, InvestmentManagement,MarghamPublishers,Chennai,2012.

SEMESTER-VIII

COURSE 21:ADVANCEDCOSTANDMANAGEMENTACCOUNTING

Theory Credits:4 4 hrs/week

Courseobjectives:

Critically analyseandproviderecommendationstoimprovetheoperationsoforganisationsthrough the application of management accounting techniques; demonstrate mastery of costingsystems,costmanagementsystems,budgetingsystemsandperformancemeasurementsystems.

Learningoutcomes:

- Identifyingthecostunitoftransportundertakingandanalysesofoperatingcosts
- Tolearnand solveproblemsabout principleledgersand overheadsvaluation
- Togainknowledgeaboutreconciliationof costandprocedureforreconciliation
- Tosolvethebudgetingmethods andlearnaboutkinds ofbudgets.
- Tolearnhow tosolveworkingcapital problemsand understandthe process.

Syllabus:

Unit1:Operating costing:

Introduction-Analysisofoperatingcosts–Costunitfortransportundertaking-Costascertainment.

Unit2:Costcontrol accounts:

Principle ledgers – Principle accounts – Treatment of over and under absorption of overheard – Importantjournal entries.

Unit3:ReconciliationofCostandFinancialAccounts:

ReconciliationMeaning–Reasonsfordifferenceinreportingprofits-ProcedureforReconciliation– Preparation ofreconciliation statement.

Unit4:BudgetaryControl:

Meaning –need–differencebetweenbudgetandforecast.Budgetary control:Definition-objectives-features–advantages-limitations.Organizationforbudgetarycontrol:Budgetmanual - budget period - key factor. Classification of budgets. Preparation of budgets: Salesbudget –production budget – purchase budget – cash budget – master budget – flexible budget -zerobasebudget. PerformanceBudget.

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Unit5:WorkingcapitalManagement:
Meaning–Conceptandclassificationofworkingcapital–
factorsdeterminingworkingcapitalrequirement– Estimation of workingcapital.

PracticalComponents

- Allstudentsshouldformintogroupsanddiscussaboutthedifferentadjustmentsandmodelsof problems andhow to solvethem.
- Studentsshouldformintoteamsandpreparepresentationsonthetopicsinthesyllabusandprovide them asassignments or seminars
- Allstudentsshouldbeinvolvedinthegroupactivitylikequizregardingtreatmentofdifferentunder orover absorption of overheads.
- Allstudentsshouldsolveprevious examinationpapersforpractice.

ReferenceBooks:

1. CostaccountingbyJain and Narang,Kalyani Publications
2. CostaccountingM.N.Arora,HimalayaPublications
3. Advanced costaccounting–J.MadeGowda, HimalayaPublications
4. Financialmanagement - SashiKGupta,.AnujGupta,KalyaniPublications
5. Financial Management - Dr. D. Surya Chandar Rao, Dr.P.Venu Gopal,Dr.G.V.S.R.N.S.A.Sastryand J. Ambica, HimalayaPublications

SEMESTER-VIII

COURSE 21:INTERNATIONALFINANCIALSYSTEM

Theory Credits:4 4 hrs/week

Courseobjective: To enlightenthestudentwiththeconcept ofinternationaltrade,balanceofpaymentsand foreignexchangemarkets.

LearningOutcomes:

- Tounderstandthetermsand theoriesofinternationaltrade
- Toensuretheknowledgeaboutbalanceofpayments,importancealsoaccountingprinciplesin BOP
- Tolearnaboutforeignexchangemarkets,understandingSPOTandforward rates
- Togainknowledgeaboutexchangeratediscrimination
- TounderstandvariousinstrumentslikeEurocurrenciesetc.,

Syllabus:

Unit1:Introduction:
International trade- its importance – theories of international trade –theory comparative costs – classical theory, absolute advantage, Hecksher – Ohlin Theory, Free trade v/s Protection BarrierstoForeign trade, Tariff and Non TariffBarriers.

Unit2:Balanceofpayment:
Meaning of BOP, Components of BOP – Importance of BOP – Meaning of Deficit and surplus – equilibrium–disequilibriumandadjustments–methodsofcorrectingdisequilibrium– accountingprinciples inBOP.

Unit3:Foreign ExchangeMarkets:
DefineForeignexchangemarkets–itsstructure–settlementsystem–exchangerate–Participants, understanding SPOT and forward rates, foreign exchange quotations- Premium anddiscountin forward market-cross rates-inverserates and arbitrage.

Unit4:Exchangeratediscrimination:
Determinationundergoldstandardandpaperstandard-factorsaffectingexchangerates–purchasing power parity theory- demand and supply theory- equilibrium rate of exchange – fluctuatingv/s.fixedexchangerates,exchangecontrol-exchangecontrol-objectivesofexchangecontrol.

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Unit5:Instruments:

ADR-GDR-Eurocurrencies-Internationalcommercialpapers.InternationalFinancialinstitutions – IntroductiontoIMF–Importance–Functions andsignificance.

PracticalComponents

- StudentsshouldlearntheconceptofInternationaltradeandtheirtheories
- AnalysetheforeignexchangemarketswhoaretheparticipantsandunderstandingofSPOTand forwardratesbyobservingstock exchangesites.
- Studentsshouldformintoteamsandpreparepresentationsonthetopicsinthesyllabusandprovid e them asassignments or seminars
- AllthestudentsshouldmakecollectinformationregardingthecompaniesinADR,Eurocurrenci esthrough search engines.
- Studentsshouldanalysetheoverviewoffluctuatingandfixedexchange rates.

ReferenceBooks

1. InternationalEconomics: TheoryandPolicy,Paul Krugman
2. TheEconomicsofExchangeRates,LucioSarno,MarkP.Taylor
3. InternationalFinance,G.Shailaja,UniversitiesPress
4. International Finance,MauriceD.Levi,RoutledgeTaylor&FrancisGroup

SEMESTER-VIII

COURSE22:ADVANCEDFINANCIALACCOUNTING

Theory Credits:4 4 hrs/week

Courseobjective:

Prepare you to analyse, interpret, and use financial statements effectively, both from a generalmanager and from an investor perspective

Learningoutcomes:

- Toobtainknowledgeabouttheprocedureforthepreparationofdeficiencyaccountbyaninsolvent person alsothedifferences betweenstatement ofaffairsand balancesheet.
- Tolearnprocess of accountingof royaltyaccounts
- Togainknowledgeaboutvariousmethodsofbranchaccountsandtheirpreparationinheadoffice and branch books.
- Togainknowledgeoftypesofinvestmentandtheirvaluationalsopreparationofinvestmentaccounts.
- To analyse theexpensesandtheir treatmentinpreparationof departmentalprofitandlossaccount.
- Toobservethedifferencesbetween branchaccountsanddepartmentalaccounts.

Syllabus:

Unit1:Insolvencyaccounts:Introduction:

Insolvency procedure- statements and lists to be prepared by the insolvent – statement of affairsanddeficiencya/c-distinction betweenabalance sheet and astatementofaffairs

Unit2:Royalty Accounts:

Introduction – Accounting entries in the books of lessee and lessor – Sub lease (Theory andProblems)

Unit3:Investmentaccounting:

Introduction- Cum dividend and ex – dividend transaction – Cum – interest and ex interesttransactions- Brokerage and expenses- accounting entries of cum dividend/ interest purchase andsale- ex dividend/ interest purchase and sale- bonus and rights issue- closing of investmentaccounts. (Theoryand Problems)

Unit4:**BranchAccounts:**

Objectives and features-books of accounts-methods of accounting- Debtors system & stock anddebtorssystem**.**

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Unit5:DepartmentalAccounts:

Need-Features-Basisofallocationofexpenses,treatmentofinterdepartmentaltransfer-preparationofdepartmentaltradingprofitandlossaccount-differencesbetweenBranchAccountingand Departmental Accounting

PracticalComponents

- Allstudentsshouldformintogroupsanddiscussaboutthedifferentadjustmentsandmodelsof problems andhow to solvethem.
- Studentsshouldformintoteamsandpreparepresentationsonthetopicsinthesyllabusandprovid ethem asassignments or seminars
- Allstudentsshouldbeinvolvedinthegroupactivitylikequizregardingbasisofapportionof expenses and incomesin profit or losspriorto incorporation
- Allstudentsshouldsolvepreviousexaminationpapersforpractice

ReferenceBooks:

1. Advanced Accountancy-Vol2S.N.Maheswari,VikasPublishingHousePvt. Ltd.
2. PracticeInAccountancy- Vol2Basu&Das,Ravindralibrary
3. AdvancedAccountancy-ArulanandamAndRaman,HimalayaPublication
4. Advanced Accountancy-Vol.1&2R.L.Gupaand Radhaswamy,SultanChand&Co
5. Advanced Accountancy- Vol1&2SpJainandKl.Narang, KalyaniPublications
6. Advanced Accountancy-Vol1&2Shukla&Grewal,S.ChandPublications.

SEMESTER-VIII

COURSE22:FINANCIALREPORTING

Theory Credits:4 4 hrs/week

Courseobjectives:

Toprovideinformationaboutthefinancialposition,performanceandchangesinfinancialpositionofan enterprisethat is useful to awiderangeof users in makingeconomicdecisions.

Learningoutcomes:

- Tolearnaboutintroductionoffinancialreporting,concept,advantageanddisadvantagesalsoobj ectives
- Tounderstandthescope andmodesofrestrictingcompetitiveadvantage
- Toevaluatethe consolidatedfinancialstatementsofholdingandsubsidiarycompanies
- Togainknowledgeonvaluationof shares
- Togainknowledgeoncorporatefinancialaccounting,newtrendsinaccountingandaccountingst andards.

Syllabus:

Unit1:FinancialReporting:

Concept, objectives, uses, purpose of financial reporting & specific purpose of report-difficultiesincorporatereporting–
issuesandproblemswithspecialreferencetopublishedfinancialstatements.

Unit2:CorporateRestructuring:

Scope and modes of restructuring competitive advantage – various types corporate restructuringstrategy.

Unit3:ConsolidatedFinancialStatementsofholding&subsidiaryCompanies:

Purposes of consolidated financial statements, Consolidation procedures – minority interests,Goodwill,Treatment ofpre-acquisition and post-acquisitionprofit-balancesheet.

Unit4:Valuationof Shares:

Need for valuation of shares, factors effecting value of shares - methods of valuation of shares:valuation of goodwill: need and methods – normal profit method, super profit method, andcapitalizationmethod.

Unit5:Corporate FinancialAccounting:

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Objectives scope role of corporate accountant, analysis &interpretation of financial statements,accounting standards. New trend in accounting: human resources accounting, environmentalaccounting, social responsibilityaccounting(Theoryonly).

Practicalcomponents:

- Studentsshouldlearntheconceptofobjectivesoffinancialreportingwithreferencetopublishedfinancial statements
- Analysethescopeandmodesofvarioustypesofcorporaterestructuringstrategywithrealenvironment.
- Studentsshouldformintoteamsandpreparepresentationsonthetopicsinthesyllabusandprovide them asassignments or seminars
- Allthestudentsshouldmakecollectinformationregardingdifferenttopcompanieswhohavesubsidiarycompanies.
- Studentsshouldanalysetheoverviewofvaluationofshares.

ReferenceBooks

1. R.S.N.Pillai,Bagarathi&Suma,FundamentalsofAdvancedAccounting,Vol1,SChand,New Delhi.
2. NehruJ.FinancialReportingbydiversified companiesvisionBooks,New Delhi.
3. HawkinsDavid FinancialStatementscorporations DowJones-IrwinHomewood1973.
4. S.PJain&K.LNarang,Corporateaccounting,Kalyanipublishers.
5. S.PJain&K.LNarang,Advanced corporateaccounting,Kalyanipublishers

SEMESTER-VIII

COURSE23:CORPORATEREPORTING

Theory Credits:4 4 hrs/week

Courseobjective:

To know the professional behaviour and compliance with accounting standards also performancereporting,groupaccountingincludingstatements andeffectof changesin accountingstandards.

Learningoutcomes:

- Thiscoursebuildsontheconcepts,conventionsandprinciplesintroducedinFinancialAccountingandFinancial Reporting.
- Thiscourseisdesignedtogivelearners athoroughgroundinginthepracticalandtheoreticalaspects of financial reportingat an advanced level.
- Thecourseaimstoenablethelearnertoanalyseandevaluatethefinancialstatementsofbothindividual and group entities.
- To developthelearner'scritical understandingofthe current issuesin financialreporting,includingthe professional and ethical dutiesofanaccountant.
- Understandingofperformancemeasurementand socialreporting.

Syllabus:

Unit1:Professionalbehaviour:

Professionalbehaviourandcompliancewithaccountingstandards,Ethicalrequirementsofcorporate reporting andthe consequences of unethical behaviour, Social responsibility, Theapplications,strengthsandweaknessesofanaccountingframework.Criticalevaluationofprinciplesand Practices

Unit2:Performancereporting:

Performance reporting - Non-current assets, Financial instruments, Leases, Segment reporting,Employee benefits, Income taxes, Provisions, contingencies and events after the reporting date,Relatedparties,Share-basedpayment,Reportingrequirementsofsmallandmedium-sizedentities(SMEs)

Unit3:Groupaccounting:

Group accounting including statements of cash flows, Continuing and discontinued interests,Changes in group structures, Foreign transactions and entities, Financial reporting in specialized,not-for-profitand publicsector entities, Entityreconstructions

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Unit4:Theeffectofchangesin accountingstandards:

The effect of changes in accounting standards on accounting systems, Proposed changes toaccounting standards, The creation of suitable accounting policies, Analysis and interpretation offinancialinformation

Unit5:Measurementofperformance:

Environmental and social reporting, Convergence between national and international reportingstandards,Currentreportingissues**.**

Practicalcomponents:

- Allstudentsshouldformintogroupsforgroupdiscussionsonproposedstandardstheireffectin accounting.
- StudentsshouldgainknowledgeondifferenttypeofentitieslikeSMEalsovisitsomeSMEto understand theprocedureand requirements to start aSME.
- Studentsshouldformintoteamsandpreparepresentationsonthetopicsinthesyllabusandprovid e them asassignments or seminars
- Allstudentsshouldformintogroupsanddiscussaboutthedifferentadjustmentsinforeigntransac tions andentities, not-for-profitand publicsector entities.

ReferenceBooks

1. CorporateReporting, StudyText, ACCA StudyText, Kaplan Publishing
2. ACCAAdvanced FinancialReporting,BPP LearningMedia
3. AdvancedFinancialReporting, ICAI
4. Corporate FinancialreportingtextbookbyICMAIlatestedition
5. FinancialaccountingandreportingbyBarryElliott andJamieElliott, PrenticeHall

SEMESTER-VIII

COURSE23:BEHAVIOURALFINANCE

Theory Credits:4 4 hrs/week

Courseobjective:

To enlighten the student with the concepts of behavioural finance, behavioural corporate financeandinvestment decisions.

Learningoutcomes:

- Tolearnaboutbasicsof behaviouralfinance.
- Tounderstandtheexpectedutilitytheoryanddecisionsmakingunderriskanduncertainty
- Togainknowledgeofbehaviouralfactorsandfinancialmarkets
- Tolearnbehaviouralcorporatefinance andcorporatedecisions
- Tounderstand aboutdecision makingrelatedto risks.

Syllabus:

Unit1:Introductionto Behaviouralfinance:

Nature,scope,objectivesandapplication;InvestmentDecisionCycle:JudgmentunderUncertainty:Cognitiveinformationperception-Peculiarities(biases)ofquantitativeandnumerical information perception - Representativeness – Anchoring - Exponential discounting -Hyperbolicdiscounting

Unit2:Utility/Preference Functions:

ExpectedUtilityTheory[EUT]andRationalThought:Decisionmakingunderriskanduncertainty - Expectedutility as a basis for decision-making – Theories based on ExpectedUtilityConcept-Investor rationalityand market efficiency.

Unit3:BehaviouralFactorsandFinancialMarkets:

The Efficient Markets Hypothesis – Fundamental Information and Financial Markets - MarketPredictability –The Concept of limits of Arbitrage Model - Asset management and behaviouralfactors - Active Portfolio Management:. - Fundamental information and technical analysis – thecasefor psychological influence.

Unit4:BehaviouralCorporateFinance:

BehaviouralfactorsandCorporateDecisionsonCapitalStructureandDividendPolicy-.Systematicapproachtousingbehaviouralfactorsincorporatedecisionmaking--ExternalFactors

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and Investor Behaviour: Mechanisms of the External Factor influence on risk perception andattitudes-Connection tohuman psychophysiologyandemotional regulation.

Unit5:EmotionsandDecision:

Making, Experimental measurement of risk-related - Measuring Risk - Emotional mechanisms inmodulating risk-taking attitude - Neurophysiology of risk taking. Personality traitsand riskattitudesin different domains.

PracticalComponents:

- Studentsshouldlearntheconceptofobjectivesofbehaviouralfinanceandinvestmentdecisioncycle.
- Analysethe scopeof expected utilitytheoryand rational thought.
- Studentsshouldformintoteamsandpreparepresentationsonthetopicsinthesyllabusandprovide them asassignments or seminars
- Allthestudentsshouldmakecollectinformationregardingmarketpredictabilityandconceptof limits of arbitragemodel.
- Studentsshouldanalysethetypesofemotionsand decision.

ReferenceBooks

1. BehaviouralFinance:Psychology,Decision-Making,andMarkets",byAckertandDeaves.
2. UnderstandingBehavioralFinancebyAckert
3. ThePsychologyofInvestingbyJohn R. Nofsinger,Pearson PrenticeHall,(4thEdition)
4. WhatInvestorsReallyWant-LearnthelessonsofbehavioralFinance,MeirStatman,McGraw-Hill
5. Handbookof Behavioral Finance–BrianR.Bruce
6. Behavioralfinance-WileyFinance-JoachimGoldberg, RüdigervonNitzsch
7. Plous,Scott, 1993,ThePsychologyof Judgmentand Decision Making,Ch 10-15

SEMESTER-VIII

COURSE24:STRATEGICCOSTMANAGEMENT

Theory Credits:4 4 hrs/week

Courseobjectives:

Thisbasicobjectiveofthecourseistoprovidestrategiccostinformationand Techniquesandtheirapplication to 'efficient and effective' businessdecisions.

Learningoutcomes:

- Tounderstandaboutthe costdrivers,conceptsandtheirallocationand apportionment
- Evaluatevariouscost techniquesandmethods
- Togainknowledgeregardinguniformcostingandits objectives,prosandcons
- Tofamiliarizeabouttransferpricingandits use
- Toknowthetheoryof constraintsand problemsregardingtargetcosting.

Syllabus:

Unit1:IntroductiontoStrategicCostManagement:

BasicCostConcepts,CostDrivers,Costallocationandapportionment– StrategicAnalysisandStrategicCost Management.

Unit2:CostManagementSystems:

JobCosting–ProcessCosting–JointProducts–StrategicProfitabilityAnalysis–PricingDecisionsand Cost Management.

Unit-3:Uniformcostingandinterfirmcomparison:

Meaning-Objectives–Advantages,limitationsof uniformcostingandinter firmcomparisons.

Unit4:Responsibilityaccountingandtransferprice:

Meaning-significance–prerequisite-responsibility–responsibilitycentreandtheirtypes– advantagesof responsibilityaccounting –Transferprice –transfer pricingmethods.

Unit5:ContemporaryCostManagement:

TargetCosting–TheoryofConstraints–LifecycleCosting– ManagementControlandStrategicPerformanceMeasurement.

PracticalComponents:

- Studentsshouldlearntheconceptofcostdriverssothatithelpsmostlyinproblemsolving

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- Allthestudentsshouldinvolveingroupactivitylikequizforapportionmentandallocationofcost from respected drivers
- Studentsshouldformintoteamsandpreparepresentations onthetopicsinthesyllabusandprovide them asassignments or seminars
- Allthestudentsshouldmaketeamsforthegroupdiscussionshowthestrategiccostmanagements houldbeeffective andwhatarethe effectsinthepresent dayenvironment

ReferenceBooks:

1. Jawaharlal,CostAccounting,TataMcGrawHill,SecondEdition,1999.
2. NigamandJai,CostAccountingPrinciplesandPractice,PrenticeHallofIndiaPublishers, 2000.
3. Blocher,I.,Chen,Lin,CostManagement:AStrategicEmphasis,McGraw Hill,1999
4. 4.Herngren,DatarandFoster,CostAccounting:AManagerialEmphasis,PearsonEducation,Eleventh Edition, 2003
5. Advanced costaccounting,J MadeGowda, Himalaya Publishinghouse.

SEMESTER-VIII

COURSE24:FINANCIALDERIVATIES

Theory Credits:4 4 hrs/week

Courseobjective:

To introduce the participants to derivative instruments, namely, forwards, futures, options andswaps,and theirvaluation.

Learningoutcomes:

- Togainknowledgeaboutvariousinstruments
- Tolearnaboutforwardcontractsandadvantages, disadvantages
- Tounderstandaboutfuturecontracts,mechanicsoffuturecontracts,advantagesanddisadvantages
- Tolearnabouthistorical usesofoptionsand typesofoptions
- Knowledgeregardingfinancialswaps

Syllabus:

Unit1:Introduction:

Meaning of Derivatives - Common Derivatives- Characteristics of Derivatives- Significance ofDerivatives - Origin and Evolution of Derivatives – types of derivatives- Derivatives vs. Shares-DerivativesMarkets-Growth and Functions-Traders in Derivatives Markets

Unit2:**ForwardContracts:**

Meaning – Classification- Features- Advantages- Disadvantages-Pricing Forwards Contracts - Hedgingwith Forward Contracts Offsettingthe Forward Position

Unit3:Futurescontracts:

Meaning -Nature - Characteristics - Significance - Types- Comparison between Futures andBadla - Mechanics of Futures Contracts- Advantages and Risks of Trading in Futures over Cash-Margin Requirements in Futures Trading- Settlement of Futures Position- Participants in FuturesMarkets

Unit4:**Optionscontracts:**

Meaning - Historical Uses of Options - Types of Option- Participants in the Options Market – RegulatoryFrameworks&Terminology-Options vs. Futures

Unit5:Financialswaps:

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Meaning–Nature-Evolution-Features–Typesofswaps:InterestRateSwaps-currencyswaps-Debt EquitySwap-CommoditySwap–EquityIndexSwaps

Practicalcomponents:

- Studentsshouldlearnthemeaningandcharacteristicsofderivativeswithreferencetotradersin derivatives market.
- Analysetheknowledgeofforwardcontractswithadvantagesanddisadvantageswithreferencet o real timeenvironment.
- Studentsshouldformintoteamsandprepare representations onthetopicsinthesyllabusandprovide them asassignments or seminars
- Allthestudentsshouldcollectinformationregardingconceptoffuturecontractsandoptioncontr acts.
- Studentsshouldanalysethemeaningoffinancialswaps evolutionandfeatures.

ReferenceBooks:

1. FinancialDerivatives: BishnupriyaMishra,SathyaSwaroopDebasish–ExcelBooks2007
2. FinancialDerivatives: S.L.Gupta–PHIpublications
3. Fundamentalsof FinancialDerivatives:PrafullaKumarSwain–Himalayapublications.

SEMESTER-VIII

COURSE 25:ACCOUNTINGFORMANAGERIALDECISIONMAKING

Theory Credits:4 4 hrs/week

Courseobjectives:

To familiarize andacquaint the student with various investment process and decisions to bemadebymanagers basedon differentapproaches.

Learningoutcomes:

- Understandvariouscostingsystemsandmanagementsystems
- Analyseandproviderecommendationstoimprovetheoperationsoforganisationsthroughtheapplication of Capital investment process
- Evaluatethecostsandbenefitsandmaketheorganisationtotaketherightdecisiononinvestment
- Familiarizedifferentelementsofcostofcapitalandvaluationofcostofequity,debt,retainedearnings andcalculation of weightedaveragecost ofcapital.
- Gainknowledge aboutreturnoninvestment,EVAconceptandperformancebudgeting.

Syllabus:

Unit1:ManagementAccounting:

Nature–Scopeandfunctions–Roleofmanagementaccountant--costconceptsandclassification – variable costing and absorption costing – Emerging costing approaches – lifecycle costing – quality costing –Kaizen costing – throughput costing –back flush costing –activity based costing – Introduction – concepts – cost drivers and cost pools – step to developABCsystem– ABC systemandcorporate strategy.

Unit2:CapitalInvestmentprocess:

Investment appraisal methods – Payback periods- ARR – Time adjusted methods – Discountedpayback period – NPV – IRR – PI –TV Method – Capital Rationing –Risk analysis – DecisionTreeApproach – Sensitivityanalysis– otherstatistical analysis.

Unit3:CVPAnalysis and Decisionmaking:

Managerial application of CVP Analysis – Make or Buy Decision – Alternative methods ofproduction – buy or lease decision – Shut down or continue – Repair or replace – Accepting bulkorders for idle capacity utilization – pricing under different situation – situation product mix –keyfactor etc.,

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Unit4:Costofcapital:

Concept –Relevance –Elements of cost of capital – cost of equity – cost of debt – cost of retainedearnings – calculation of weighted average cost of capital – cost control and cost techniques –valueengineering.

Unit5:PerformanceMeasurement:

Financialand Non-Financial Measurement – Performance –Return on investment – Residualincome – EVA concept – Measurement – Balanced score card –concept – objectives – multiplescore card measures- new horizons in management control – transfer pricing – responsibilityaccounting– performancebudgeting–ZBB– Socialcost–Benefit analysis

PracticalComponents:

- AllstudentsshouldgainknowledgeonqualitycostingandKaizencosting,alsoemergingcosting approaches.
- Studentsshouldgainknowledgeondifferenttypesofcapitalinvestmentprocessbysolvingeachproblem inall the methods.
- Allstudentsshouldsolvepreviousexaminationpapersforpractice.
- StudentsshouldanalysethedifferentdecisionsofmanagementregardingCVPanalysis.

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ReferenceBooks

1. Murphy,ManagerialAccounting.
2. ManMohan&Goyal,PrinciplesofManagementAccounting..
3. Welsch,Budgeting,ProfitPlanningand Control..

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SEMESTER-VIII

COURSE25:SECURITYANALYSISANDPORTFOLIOMANAGEMENT

Theory Credits:4 4 hrs/week

Courseobjective:
To enlighten the students with the Concepts and Practical applications of Measure risk and returnofdifferent securityinstruments and portfolio.

Learningoutcomes:
Aftercompletionofthecourse,thestudent isable to

- Understandthe variousforms ofinvestment,securityMarkets andotherconcepts.
- Understandrisksassociatedwithinvestment.
- Measureriskand return of differentsecurityinstrumentsand portfolio.
- Analyse the fundamental strength of stocks and predict the price trends of securities usingtechnicalanalysisand valuationof stocks and fixedincomesecurities.
- Evaluatetheperformanceofportfolio.

Syllabus:

Unit1:ConceptofInvestment:
Objectives–InvestmentVsSpeculation–SecurityInvestmentVsNon-securityFormsofInvestment – Investment Process – Sources of Investment Information –Security Markets –Primaryand Secondary–MarketIndices.

Unit2:Return andRisk:
Meaning and Measurement of Security Returns – Types of Security Risks – Systematic Vs Non-systematicRisk– Measurement ofTotal Risk.

Unit3:FundamentalAnalysisofStocks:
Economy, Industry and Company Analysis, Intrinsic Value –Approach to Valuation of Bonds,PreferenceShares andEquityShares.

Unit4:Technical Analysis:
Concept and Tools of Technical Analysis – Technical Analysis Vs Fundamental Analysis – EfficientMarket Hypothesis–Concept and Forms ofMarket Efficiency.

Unit5:ElementsofPortfolioManagement:

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Portfolio Models – Markowitz Model, Efficient Frontier, Sharpe Single Index Model and CapitalAsset Pricing Model – Performance Evaluation of Portfolios – Sharpe Model, Treynor model –Jensen'sModel forPFEvaluation– Portfolio Revision.

Practicalcomponents:

- Studentsshouldlearntheconceptofinvestmentalsodifferencesbetweeninvestmentandspeculation,sources of investment information.
- Analysethe measurementof securityreturnsand typesof securityrisks
- Studentsshouldformintoteamsandpreparepresentationsonthetopicsinthesyllabusandprovide them asassignments or seminars
- Allthestudentsshouldcollectinformationregardingconceptandformsofmarketefficiency
- Studentsshouldanalysetheelementsofportfoliomanagement.

ReferenceBooks:

1. FisherandJordan,SecurityAnalysis&Portfolio Management6e,(2011) Pearson,PHI.
2. S.Kevin,SecurityAnalysis&PortfolioManagement,2e(2015)PrenticeHallIndia.
3. AvadhaniVA,SecuritiesAnalysis&PortfolioManagement,9e(2017)HimalayaPublishingHouse.
4. PrasannaChandra,InvestmentAnalysisandPortfolioManagement3e,(2011)TataMcGraw-HillEducation
5. P.Pandian,SecurityAnalysisandPortfolioManagement,1e(2014),VikasPublishingHousePvt.Limited.

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24COURSESTRUCTU

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Semester	Course Number	CourseName	No. ofHrs/Week	No. ofCredits
Semester-I	1	FundamentalsofCommerce	4	4
	2	BusinessOrganization	4	4
Semester-II	3	PrinciplesofManagement	4	4
	4	BusinessEconomics	4	4
Semester-III	5	BusinessLaw	4	4
	6	OrganisationalBehaviour	4	4
	7	BusinessEnvironment	4	4
	8	Business Statistics andMathematics	4	4
Semester-IV	9	MarketingManagement	4	4
	10	Human ResourceManagement	4	4
	11	FinancialManagement	4	4
Semester-V	12	SalesandDistribution(OR)AdvertisingManagement	4	4
	13	Training and Development(OR)Labour Legislation	4	4
	14	Security Analysis andPortfolio(OR)FinancialMarkets	4	4
	15	Production and OperationsManagement (OR) ProjectManagement	4	4
Semester-VI	**Internship**			
	16	ServicesMarketing(OR) BrandManagement	4	4
	17	Financial Derivatives (OR)FinancialServices	4	4

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Semester-VII	18	PerformanceManagement (OR) CompensationManagement	4	4
	SEC			
	19			

	20			
Semester-VIII	21	GlobalMarketing(OR)IndustrialMarketing	4	4
	22	Investment Management(OR)InternationalFinancialManagement	4	4
	23	LabourWelfare(OR)Industrial Safety	4	4
	SEC			
	24			

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SEMESTER-I

COURSE1:FUNDAMENTALSOFCOMMERCE

Theory Credits:4 4 hrs/week

LearningObjectives:

The objective of this paper is to help students to acquire conceptual knowledge of the Commerce,Economy and Role of Commerce in Economic Development. To acquire Knowledge on AccountingandTaxation.

LearningOutcomes:

Attheendofthecourse,thestudentwillableto

Identify the role commerce in Economic Development and Societal Development. Equip with theknowledge of imports and exports and Balance of Payments. Develop the skill of accounting andaccountingprinciples.Theyacquireknowledgeonmicroandmicroeconomicsandfactorsdetermine demand and supply. An idea of Indian Tax system and various taxes levied on in India.Theywillacquireskillsonweb designanddigital marketing.

Unit 1: Introduction: Definition of Commerce – Role of Commerce in Economic Development - Role Commerce in Societal Development.Imports and Exports, Balance of Payments. WorldTrade Organization.

Unit 2: Economic Theory: Macro Economics – Meaning, Definition, Measurements of NationalIncome, Concepts of National Income. Micro Economics – Demand and Supply. Elasticity ofDemandandSupply.ClassificationofMarkets-PerfectCompetition–Characteristics– EquilibriumPrice, Marginal Utility.

Unit 3: Accounting Principles:Meaning and Objectives Accounting, Accounting Cycle - Branches of Accounting - Financial Accounting, Cost Accounting, Management Accounting.Conceptsand Conventions of Accounting– GAAP.

Unit 4: Taxation: Meaning of Tax, Taxation - Types of Tax- Income Tax, Corporate Taxation,GST, Customs & Exercise. Differences between Direct and Indirect Tax – Objectives of Tax-Concerned authorities – Central Board of Direct Taxes (CBDT) and Central Board of Excise andCustoms(CBIC).

Unit 5: Computer Essentials: Web Design - Word Press Basics, Developing a Simple Website.Digital Marketing - Social Media Marketing, Content Marketing, Search Engine Optimization(SEO),E-mailMarketing.DataAnalytics- Predictionofcustomerbehavior,customizedsuggestions.

LabExercise:

- Buildasamplewebsitetodisplayproductinformation.
- Providewidepublicityforyourproductoversocialmediaande-mail
- Estimatethecustomerbehaviorandprovide necessarysuggestionsregardingtheproductsofhisinterest.

Activities:

- AssignmentonGAAP.
- GroupActivatesonProblemsolving.
- CollectdateandreporttheroleofCommerceinEconomicDevelopment.
- Analyzethedemandandsupplyofaproductandmakeascheduledbasedonyouranalysis,problems on elasticityof demand.
- IdentifytheTaxanddistinguishbetweenDirectTaxandIndirectTax.
- AssignmentsandstudentsseminarsonDemandfunctionanddemandcurves
- QuizPrograms
- AssignmentondifferenttypesoftaxeswhichgeneraterevenuetotheGovernmentofIndia.
- InvitedlecturesonGSTandTaxationsystem
- ProblemSolvingExercisesoncurrenteconomysituation.
- Co-operativelearningonAccountingPrinciples.
- GroupDiscussionsonproblemsrelatingtotopicscoveredbysyllabus
- Examinations(Scheduledandsurprisetests)
- Anysimilaractivitieswithimaginativethinkingbeyondtheprescribedsyllabus

ReferenceBooks:

1. S.P.Jain&K.LNarang,Accountancy-IKalyani Publishers.
2. R.L.Gupta&V.K.Gupta,PrinciplesandPracticeofAccounting,SultanChand
3. BusinessEconomics-S.Sankaran,MarghamPublications,Chennai.
4. BusinessEconomics-KalyaniPublications.
5. Dr.VinodK.Singhania:DirectTaxes–LawandPractice,TaxmannPublications.
6. Dr.MehrotraandDr.Goyal:DirectTaxes–LawandPractice,SahityaBhavanPublications

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SEMESTER-I

COURSE2:BUSINESSORGANIZATION

Theory Credits:4 4 hrs/week

Thecourseaimstoacquireconceptualknowledgeofbusiness,formationvariousbusinessorganizations. To provide the knowledge on deciding plant location, plan layout and businesscombinations.

Learningoutcomes:

Aftercompletingthiscourseastudentwillhave:

Ability to understand the concept of Business Organization along with the basic laws and norms ofBusiness Organization. The ability to understand the terminologies associated with the field ofBusiness Organizationalongwiththeirrelevanceandtoidentifytheappropriatetypesandfunctioning of Business Organization for solving different problems. The application ofBusinessOrganization principles to solve business and industry related problems and to understand theconceptofSoleProprietorship,PartnershipandJointStock Companyetc.

Unit 1: Business: Concept, Meaning, Features, Stages of development of business and importanceofbusiness.ClassificationofBusinessActivities.Meaning,Characteristics,ImportanceandObjectives of Business Organization.. Difference between Industry & Commerce and Business &Profession,ModernBusiness and theirCharacteristics.

Unit 2: Promotion of Business: Considerations in Establishing New Business. Qualities of aSuccessful Businessman. Forms of Business Organization - Sole Proprietorship, Partnership, JointStockCompanies&Co-operativesandtheir Characteristics,relativemeritsanddemerits,Differencebetween Privateand PublicCompany,Conceptof OnePersonCompany.

Unit 3: Plant Location and Layout: Meaning, Importance, Factors affecting Plant Location. PlantLayout

- Meaning, Objectives, Importance, Types of Layout. Factors affecting Layout. Size of BusinessUnit - Criteria for Measuring the Size and Factors affecting the Size. Optimum Size and factorsdeterminingtheOptimum Size.

Unit4:BusinessCombination: Meaning,Characteristics,Objectives,Causes,FormsandKindsof Business Combination. Rationalization: Meaning, Characteristics, Objectives, Principles, Meritsanddemerits, DifferencebetweenRationalization and Nationalization.

Unit 5: Computer Essentials: Milestones of Computer Evolution – Computer, Block diagram,generations of computer. Internet Basics - Internet, history, Internet Service Providers, Types ofNetworks, IP, Domain Name Services, applications. Ethical and Social Implications - Network andsecurityconcepts-InformationAssuranceFundamentals,Cryptography-SymmetricandAsymmetric,Malware, Firewalls,Fraud Techniques, privacyand data protection

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Activities:

- Assignmentonbusinessorganizationsandmodernbusiness.
- GroupDiscussiononfactorsthatinfluenceplanlocation
- SeminarsondifferenttopicsrelatedtoBusinessorganization
- Casestudycouldbegiventopresentbusinessplanofstudentschoice.
- Identifyingtheattributesofnetwork(Topology,serviceprovider,IPaddressandbandwidthofyour collegenetwork) and prepare areport coveringnetworkarchitecture.
- Identifythetypesofmalwaresandrequiredfirewallstoprovidesecurity.
- LatestFraudtechniquesusedbyhackers.

ReferenceBooks:

1. Gupta,C.B.,"BusinessOrganisation",MayurPubliction,(2014).
2. Singh, B.P., Chhabra, T.N., "An Introduction to Business Organisation& Management", KitabMahal,(2014).
3. Sherlekar,S.A.&Sherlekar,V.S,"ModernBusinessOrganization&ManagementSystemsApproachMumbai", Himalaya PublishingHouse, (2000).
4. BhusanY.K.,"BusinessOrganization",SultanChand&Sons.
5. Prakash,Jagdish,"BusinessOrganistatonandManagement",KitabMahalPublishers(HindiandEnglish)
6. FundamentalsofComputersbyV.RajaRaman
7. CyberSecurityEssentialsbyJamesGraham,RichardHoward,RyanOlson

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SEMESTER-II

COURSE 3:PRINCIPLES OFMANAGEMENT

Theory Credits:4 4 hrs/week

CourseObjectives

- Tooutlinethefundamentalactivities of managers
- Toexplainthebasicconcepts,principlesandtheoriesofmanagement
- Toexaminethebroadfunctionsofmanagement
- Tocomprehendthecontemporaryissuesandchallengesinthefieldofmanagement
- Tounderstand variouscontroltechniquespractised atorganisations.

UNIT-I:INTRODUCTIONTOMANAGEMENT

Definition – Nature, process and significance of management . Role of managers – Managerial Skillsand Roles. Schools of Management Thought , Management as a Science or Art - Management as aprofession, Administration and Managemen. Functions of Management. Contemporary Issues andChallengesin Management of 21st Century.

UNIT-II:PLANNING

Planning - Nature and Importance of Planning, Types of Plans- Levels of Planning. Steps in planningprocess, Making Effective Plans. Significance of Objectives, Management by Objectives (MBO).Decisionmaking-Nature of decisionmaking, Types ofdecisions, DecisionMakingProcess.

UNIT-III:ORGANIZING

Organizing - Nature and purpose, Principles of Organization, Types of Organization. OrganisationalStructure and Design – Line, Staff and functional authority, Conflict between Line and Staff –Overcoming the Line-Staff Conflict. Committees, Departmentation. Authority, Responsibility andAccountability, Principles of Delegation , process of delegation. Span of Control, Centralization Vs.Decentralization,Factorsdeterminingthe degreeofDecentralization ofauthority.

UNIT-IV:STAFFINGAND DIRECTING

Staffing-
NatureandPurposeofStaffing,Importanceofstaffing.ComponentsofStaffing,Manpowerplanning,Recruitmentand Selection.Directing–NatureofDirectingfunction.ConceptofMotivation,theoriesofMotivation-Maslow'stheoryofNeedHierarchyandHerzberg'sDual

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Factortheory,Motivatingpeopleatwork.Communicationskillsfordirecting,Barriersincommunication.

UNIT-V:CONTROLLING

Controlling-
Concept,NatureandImportance,EssentialsofControl.RequirementsofaneffectiveControlSystem,Techniques ofManagerial control.BehaviouralImplicationsof Control.

ReferenceBooks:

1. Koontz,H.,&Weihrich, H.Essentials ofManagement,McGrawHillPublishers.
2. Gupta,R.S.,Sharma,B.D.,&Bhalla.N.S.Principles&PracticesofManagement.NewDelhi,Kalyani Publishers.
3. LMPrasad,PrinciplesandPracticesofManagement,HimalayaPublishingHouse
4. Rao,P.S.PrinciplesofManagement,HimalayaPublishingHouse.

SEMESTER-II

COURSE 4:BUSINESSECONOMICS

Theory Credits:4 4 hrs/week

CourseObjectives:

- Understandthe conceptofeconomics anditsrelevanceto business.
- Comprehendtheconcept ofDemand analysisformakingimportantbusinessdecisions
- Learntoapplytheconceptsofcostand Break-evenanalysisandlearnvarioustheoriesonproduction.
- Understandconceptsof perfectcompetition andmonopolyforfixation ofprices.
- Understandtheinternationalbusinessscenarioandconceptsof BOP.

Unit-I:INTRODUCTION

Meaning and Definitions of Business Economics - Nature and Scope of Business Economics - MicroandMacroEconomics and theirInterface.

UNIT-II:DEMANDANALYSIS

Meaning and Definition of Demand, Determinants to Demand. Demand Function, Law of Demand,Demand Curve, Exceptions to Law of Demand.Elasticity of Demand,Measurement of PriceElasticityofDemand.

UNIT–III:PRODUCTION,COSTANDREVENUE ANALYSIS

Concept of Production Function, Law of Variable Proportion, Law of Returns to Scale. Concept ofTotalRevenue,AverageRevenueandMarginalRevenue.ClassificationofCosts,Break-EvenAnalysis,applications ofBreak-Even analysis.

UNIT-IV:MARKETSTRUCTURE

ConceptofMarket–ClassificationofMarkets.PerfectCompetition–Characteristics,EquilibriumPrice,Monopoly– Characteristics, Equilibriumunder Monopoly.

UNIT-V:NATIONALINCOMEANDSTRUCTURALREFORMS

Concepts of National Income- Definition,Measurement of National Income. Trade cycles – Meaning,Phases.Benefits of International Trade,Balanceof Trade,BalanceofPayments. ConceptsofEconomicliberalization,Privatization,Globalization.WTO-Objectives,Functions.

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ReferenceBooks:

1. AryasriandMurthy-BusinessEconomics-Tata McGrawHill.
2. H.LAhuja-BusinessEconomics-Sultan Chand&Sons.
3. S.Sankaran-BusinessEconomics-MarghamPublications.
4. P.C.Chopra-BusinessEconomics –KalyaniPublications.
5. Deepasree-BusinessEconomics -HimalayaPublishingHouse.

SEMESTER-

IIICOURSE5:BUSINESSLAW

Theory Credits:4 4hrs/week

CourseObjectives:

- To equipthestudentwithfundamentalconcepts,principlesrelatingtoContractActthatappliesto business situations.
- Toprovideanoverview on NegotiableInstrumentsActandPartnershipActinIndia.
- Tounderstandtheregulatoryframeworkofcompanieswithreferencetovariousprovisionsof CompaniesAct.
- Tounderstandtheessentialsandexecutionof Sale contracts.
- Toacquireknowledgeon RighttoInformationActand ConsumerProtectionAct.

UNIT-I:LAWOFCONTRACT

Definition,Essentialsofvalidcontract,Kindsofcontract,Offer,Acceptance,consideration.CapacityofPartiestocontract,FreeConsent,DischargeofContract,BreachofContractandRemediesfor Breach .Special Contracts,Indemnity,Guarantee,Bailment.

UNIT-II:NEGOTIABLEINSTRUMENTSACT1881

Nature and characteristics of Negotiable Instruments, Kinds of Negotiable Instruments-PromissoryNotes, Bills of Exchange and Cheques.Partnership Act, 1932- Definition, Essentials of Partnership,KindsofPartners, RightsandLiabilitiesofPartners.Dissolution ofPartnership Firm.

UNIT–III:COMPANIESACT,2013

Definition of Company, Types of Companies. Memorandum of Association, Articles of Association,prospectus, Meetings and Resolutions. Doctrine of Ultra Vires, Doctrine of Constructive Notice,ModesofWindingup ofaCompany.

UNIT–IV:SALEOFGOODSACT

Meaning and definition, Essentials of Sale Contract, Sale and Agreement to Sell. Rules of transfer ofproperty- conditions and warranties. Unpaid Seller- Rights of Unpaid Seller. Sale by Non-Owners ,AuctionSale.

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UNIT–V:RIGHTTOINFORMATIONACT&CONSUMER PROTECTIONACT

Right to Information Act- Overview of the Act, The Consumer Protection Act 2019, ConsumerCouncils, Consumer Redressal Agencies- District Forum, State Forum, National Forum, Penalties forviolation.

ReferenceBooks:

1. P.C.Tulsian,BharatTulsian,Business Law,McGrawHillEducation.
2. N.D.Kapoor,ElementsofBusinessLaw,Sultan ChandPublication,Company.
3. DrS.N.Maheshwari&DrS.K.Maheshwari, BusinessLaw,HimalayaPublishingHouse.
4. M.C.KuchhalandVivekKuchhal,BusinessLaw,SultanChand& Sons(P)Ltd.India.

SEMESTER-III

COURSE6:ORGANIZATIONAL BEHAVIOUR

Theory Credits:4 4 hrs/week

CourseObjectives:

- Tounderstandindividualandgroupbehaviouratworkplaceto improvethe effectiveness ofanorganization.
- Tounderstand different types ofpersonalityand learningstyles.
- Comprehendconceptsrelatingtogroupdynamicsandconflictmanagement.
- Tounderstandleadershipanditsimpactongroup dynamics.
- Tounderstandthe processof Changemanagementand issuesinvolved init.
- Tounderstandorganizationalcultureandorganizationaleffectiveness.

UNIT-I:ORGANIZATIONALBEHAVIOR

Organizationalbehaviour-
Meaning,significance,evolution.Factorsinfluencingorganizationalbehaviour- Perception – concept and process of perception, Factors influencing perception. Valuesand Attitudes. Personality - Stages of personality development, Determinants of personality. Conceptof Learning and theoriesof learning.

UNIT-II:GROUPDYNAMICS

Meaning ofgroups andgroup dynamics, Stages in the Formation of groups, Characteristics andTypesofgroups.Factorsinfluencinggroupeffectiveness-Groupcohesiveness,Groupdecisionmaking. Teams-Groups Vs Teams , Types of teams. Conflicts in groups- reasons for conflicts,ManagementofConflict-application ofTransactional Analysis, Johari Window.

UNIT-III:LEADERSHIP

Definition and Concept of Leadership , importance of Leadership, characteristics of an EffectiveLeader. Styles of Leadership, Managerial Grid,Leadership Continuum. Theories of Leadership.ImpactofLeadershipon effectivenessofgroups .

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UNIT-IV:MANAGEMENTOFCHANGE

Meaning and importance of Change, Factors driving organizational change. Response to change, roleofChange Agents. Resistance to Change – Reasons for Resistance, dealing with resistance to chang.OrganizationalDevelopment– Significance andprocess of OD.

UNIT-V:ORGANIZATIONALCULTURE

Concept of Organizational Culture, Significance of understanding organizational culture, Distinctionbetweenorganizationalcultureandorganizationalclimate.FactorsinfluencingOrganizational Culture.OrganizationalEffectiveness-
Indicatorsoforganizationaleffectiveness,achievingorganizationaleffectiveness. Organizational Power and Politics.

ReferenceBooks:

1. Robbins,P.Stephen-OrganizationalBehaviour-Concepts,Controversies&Applications-PrenticeHall ofIndiaLtd., New Delhi.

2. LuthansFred–Organizational Behaviour-McGrawHillPublishersCo. Ltd.,NewDelhi,

3. Rao,VSPandNarayana,P.S.-OrganizationTheory&Behaviour-KonarkPublishersPvt.Ltd.,Delhi.

4. Prasad,L.M-Organizational Theory&Behaviour-SultanChand&Sons,NewDelhi.

SEMESTER-III

COURSE7:BUSINESSENVIRONMENT

Theory Credits:4 4 hrs/week

Courseobjectives:

- ToenablethestudentstodevelopanunderstandingonIndianBusinessEnvironmentandvariousfactors impacting the business.
- Tohelpthem makeeffective decisionsbased onanalysisofbusiness environment.
- Todevelopan understandingoftheMSMEsector and challengestherein.
- Tofamiliarizethestudentswithinternationaltradeandissuesrelatedto BalanceofPayments.
- Tocomprehendtheroleof Internationalinstitutionsinthegrowthofinternationalbusiness.

UNIT-I:INTRODUCTION

Business Environment-Concept, Significance and Nature of Business Environment; Elements ofEnvironment- Internal and External. Salient features of Indian Economy, evolution in the recentyears.

UNIT-II:POLITICAL,LEGAL ANDECONOMICENVIRONMENTOFBUSINESS

Elements of Political Environment,Role of Government in Business facilitation . Competition Act'FEMA,LicensingPolicies.ElementsofEconomicEnvironment,Economicsystems.IndustrialPolicy1991, EconomicReforms.PlanningCommission Vs NITIAayog**.**

UNIT-III:MANGEMENTOFMICRO, SMALL&MEDIUMENTERPRISE (MSME)

ConceptsandDefinitionsofMSME,TheMSMEDevelopmentAct,2006.GovernmentPolicyInitiative, Current Schemes for MSME development. Problems faced by MSME Sector. Role ofClustersin PromotingMSME.

UNIT–IV:BALANCEOFPAYMENTS

InternationalTrade,ComponentsofBOP,DisequilibriuminBOP,Reasonsfordisequilibrium.Measures to bring back equilibrium in BOP –trade regulation, Exchange Control, Convertibility ofCurrency,Current Account and CapitalAccountconvertibility.

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UNIT–V:INTERNATIONALBUSINESSENVIRONMENT

International economic institutions-Significance, Evolution and Functions - International MonetaryFund, World Trade Organization, World Bank , BRICS and EU. Objectives and Evolution of GATT,Uruguay Round.Foreign Direct Investment- Need for FDI in Developing Countries, Role of FDI inIndia.

ReferenceBooks:

1. FrancisCherunilam,BusinessEnvironment-HimalayaPublishingHouse.
2. Aswathappa,EssentialsofBusinessEnvironment,HimalayaPublishingHouse.
3. MishraandPuri,Indian Economy, HimalayaPublishingHouse.
4. RajAggarwal,BusinessEnvironment,ExcelBooks.

SEMESTER-III

COURSE8:BUSINESSSTATISTICSANDMATHEMATICS

Theory Credits:4 4hrs/week

CourseObjectives:

- UnderstandtheimportanceofStatisticsin realworldbusinessapplications.
- Formulatecomplete,concise andcorrectmathematicalproofs.
- Frameproblemsusingmultiplemathematicalandstatisticaltools,measuringrelationshipsbyusingstandard techniques.
- Buildandassess data-basedmodels, learn and applythe statisticaltoolsto business.
- Createquantitativemodels tosolverealworld problemsin appropriatecontexts.

UNITI:INTRODUCTIONTOBUSINESSSTATISTICS

Meaning, definition, functions, importance and limitations of Statistics in business context. Methods ofDataCollection–PrimaryandSecondarydata.ToolsforDataCollection–Scheduleandquestionnaire. Frequency distribution, Tabulation of Data , Diagram and graphic presentation of data.StatisticalSystem inIndia.

UNITII:MEASURESOFCENTRALTENDENCYAND DISPERSION

Definition, objectives and characteristics of Measures of Central Tendency – Types of Averages – ArithmeticMean,GeometricMean,HarmonicMean.Median,Mode,Quartiles,Decilesandpercentiles.Properties ofaveragesandtheirapplication.Meaning,definitions,objectivesofDispersion, Range Quartile Deviation, Mean deviation, Standard Deviation. Co-efficient of variation.DefinitionandobjectivesofSkewness–KarlPearson'sandBowle's measuresofskewness.

UNITIII:MEASURESOFCORRELATION

Meaning,Definitionanduseofcorrelation.TypesofCorrelation-KarlPearson'scorrelationcoefficient, Spearman's Rank correlation. Probable error , Meaning and utility of Regression Analysis,comparison between Correlation and Regression, Regression Equations, Interpretation of RegressionCo-efficients.

UNITIV:SETTHEORY

Set, Subset, Types of Sets. Operations on sets, De Morgan's Law of Venn Diagram. Applications ofSettheory.LawsofIndices,ArithmeticProgressions,GeometricProgressions,HarmonicProgressions.

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UNITV:MATRIX

Meaningandoperations,MatrixAlgebra.Typesofmatrices,Matrixaddition,MatrixMultiplication.MatrixDeterminants, Minors and Co-factors , Matrixinversion.

ReferenceBooks:

1. SivayyaK. V.andSatyaRao,BusinessMathematics,SaradhiPublications,Guntur.
2. SanchetiandKapoor V K., BusinessMathematics,SultanChand&Sons,NewDelhi.
3. D.N.Elhance:FundamentalofStatistics,KitabMahal,Allahabad.
4. GuptaS.C.Fundamentals ofBusinessStatistics,SultanChand, NewDelhi.
5. Aggarwal,BusinessStatistics,KalyaniPublishers,Hyderabad.
6. ReddyCR,BusinessStatistics,Deep&DeepPublications,NewDelhi.

SEMESTER-IV

COURSE 9:MARKETINGMANAGEMENT

Theory Credits:4 4hrs/week

CourseObjectives:

- Togive anoverviewofmarketingenvironment.
- Tointerpretthelinkbetweenstrategicplanningandmarketing.
- Todevelopadetailedmarketingplan.
- Tounderstandroleofintermediariesinmarketingactivities.
- Toacquireknowledgeonvariouspromotionaltoolsinmarketing.

UNIT-I:INTRODUCTIONTOMARKETINGMANAGEMENT

Definition,ImportanceandScopeofMarketing.CoreConceptsofMarketing,Company'sorientations towards Marketing. Marketing Process, Selling Vs Marketing. Elements of MarketingMix,Marketingenvironment.

UNIT-II:SEGMENTATION,TARGETINGAND POSITIONING

BasisforSegmentation,ProcessofSTP.LevelsofSegmentation,PatternsofTargetingandpositioningstrategies. Segmentation,targetingandpositioningforcompetitiveadvantage.

UNIT-III:PRODUCT

Product – Characteristics, Benefits. Classification of Products – Consumer goods – Industrial goods.NewProductDevelopmentprocess,ProductLifeCycle– StagesinPLCandapplicationtomarketing.BrandingofProducts,PackagingandLabeling.Significanceof Warranties&Guarantees.

UNIT-IV:PRICINGANDDISTRIBUTION

Pricing–Factorsinfluencingpricingdecisions,objectivesofpricing.Pricingpoliciesandprocedures , Types of Pricing Strategy. Physical Distribution- Importance, various kinds of Marketing Channels,criteriaof selectingachannel.

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UNIT-V:PROMOTION

Integrated Marketing Communication, Process of IMC. Elements of Promotional Mix-Advertising,Publicity, Public Relations, Personal Selling, Direct selling and Sales promotion. Significance ofPromotionalMixin marketingdecisions.

ReferenceBooks:

1. Kotler.P,&Keller.K.L.,Koshy&Jha(2020).MarketingManagement,20thedition,Pearson.
2. Ramaswamy&Nmakumary-MarketingManagement-GlobalPerspective-IndianContext-MacMillonIndiaLtd.
3. Saxena,Rajan,MarketingManagement,Tata-McGrawHill,NewDelhi.
4. S.A.Sherlekar,R.Krishnamoorthy,MarketingManagement,HimalayaPublishingHouse.

SEMESTER-IV

COURSE 10:HUMAN RESOURCEMANAGEMENT

Theory Credits:4 4 hrs/week

CourseObjectives:

- Tounderstandthe significanceof humanresourcemanagementandroleofHRExecutives.
- Toacquireknowledgeonprocurementanddevelopmentfunctions.
- Tounderstandthe sourcesofrecruitmentandthestagesin selectionprocess.
- Togainknowledgeon traininganddevelopmentmethods.
- Tounderstandtheconceptof Industrialrelations anditsimpactonHRM.

UNIT-1:INTRODUCTION

Human Resource Management –Nature, Significance and Scope.Functions of HRM, Role of HRManager, Advisory and service function to other departments. Changing role of HRM, ContributiontoCompany'sobjectives and policies, organizingtheHRM Department.

UNIT-II:PROCUREMENTANDDEVELOPMENTFUNCTIONS

Human Resource Planning , Job Analysis, Job description, job specification. Recruitment- Sources ofrecruitment, process of recruitment, Selection- stages in selection process, techniques of Selection.Placementand inductionof new candidates,socializationprocess.

UNIT-III:TRAININGANDDEVELOPMENT

Significance and scope of Training, Designing of a Training Program, Steps in Training. Methods ofTraining- On the Job and Off the Job techniques. Evaluation of Training effectiveness. ExecutiveDevelopment-
Concept,significance,TrainingVsDevelopment.TechniquesofExecutiveDevelopment.

UNIT-IV:PERFORMANCEAPPRAISALANDCOMPENSATION

Performance Appraisal- Importance of Performance Appraisal, Process of Performance Appraisal.MethodsofPerformanceAppraisal-Traditionalandmoderntechniques.JobEvaluation-
Significance of Job Evaluation, Process of Job Evaluation.Methods of Job Evaluation, Role of JobEvaluation in wage fixation. Compensation- Introduction to Compensation Management, ObjectivesofCompensation, Components of Compensation.

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UNIT-V:INDUSTRIALRELATIONS

IndustrialRelations-Definition,Significance,ObjectivesofIndustrialRelations.IndustrialDisputes-TypesofIndustrialDisputes.GrievanceRedressalProcedure.CollectiveBargaining-ObjectivesofCollectivebargaining,ProcessofCollectivebargaining,typesofCollectivebargaining.

ReferenceBooks:

1. ATextbookofHumanResourceManagement–C.B.Mammoria&S.V.Ghankar.-HimalayaPublishingHouse.

2. PersonnelandHumanResourceManagement-Text&Cases,PSubbaRao,HimalayaPublishingHouse.

3. HumanResourceManagement – P.Jyothi,Oxford UniversityPress.

4. HumanResourceManagement,R.WayneMondy,RobertM,Noe,Pearson Education.

SEMESTER-IV

COURSE11:FINANCIALMANAGEMENT

Theory Credits:4 4 hrs/week

Courseobjectives:

- Togainbasicknowledge ofobjectivesofFinancialManagementanditsfunctions.
- Tounderstandthecapitalbudgetingprocessand riskanalysisincapitalbudgeting.
- Togainfamiliarizationwithdifferentfinancialdecisionsthatimpactanyorganisation.
- Understanddecisionsrelatingtodividend policies andtheirvaluation.
- Knowledgeregardingsignificanceofworkingcapitalmanagementto organisation.

UNITI:INTRODUCTION

Nature, Scope and Objectives of Financial Management, Functions of Finance - Profit Maximizationvs.WealthMaximization,Role of FinancialManager inModern BusinessOrganizations,Risk-ReturnTradeoff.

UNITII:INVESTMENT DECISIONS

Capital Budgeting Process – Cash Flow Estimation and measurement , Investment criterion. Methodsof appraisal- Traditional Techniques and Discounted Cash Flow Methods. Capital rationing, Riskanalysisin capital budgeting.

UNITIII:FINANCINGDECISIONS

Concept of Leverage, Types of Leverages. EBIT – EPS Analysis. Capital Structure, Determinants ofCapitalStructure- Theories–NetIncome approach,NetOperatingIncomeapproach.Traditionalview –MMHypothesis.CostofCapital:Typesof CostofCapital,WeightedAverageCostofCapital.

UNITIV:DIVIDEND DECISIONS

Kinds of Dividends, Types of Dividend Policy. Dividend Theories - Walter's Model, Gordon'sModel,M-M Hypothesis. Retained Earnings Policies,Bonus Shares.

UNITV:WORKINGCAPITALMANAGEMENT

Concept of Working Capital , Determinants of Working Capital. Determination ofOptimum level ofCurrent Assets – Liquidity vs. Profitability, Risk – Return tangle. Estimating working capital needs,Financingstrategiesofworkingcapital.Inventory Management–Inventory ControlTechniques,ReceivablesManagement, Cash Management.

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ReferenceBooks:

1. Brealey,RichardandMyers,Steward:PrinciplesofCorporateFinance,NewYork,McGrawHillIndia.
2. Soloman,Ezra,TheoryofFinancialManagement,ColumbiaPress.
3. JamesC.VanHorne,FinancialManagementand Policy,PrenticeHallof India.
4. WestonJ.FredandBrigham,EugeneF.,ManagerialFinance,DrydenPress.
5. PrasannaChandra,FinancialManagement,McGrawHillIndia.
6. Khan,M.Y.andJain,FinancialManagement,McGrawHillIndia.

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SEMESTER-V

COURSE12:SALESANDDISTRIBUTIONMANAGEMENT

Theory Credits:4 4hrs/week

CourseObjectives:

- To provide conceptual knowledge about different types of sales plans and sales organisationsfordifferentfirms.
- Tounderstandsalesforecasting,budgetinganddifferentmethodsofanalysingmarketpotential.
- To enable the students to understand the recruitment, selection, training, compensation andcontrollingapproaches relatingto thesales personnel of afirm.
- To give inputs to the students to design suitable channel structures as well as to manage(recruitment, selection, training, compensating and controlling of channel members) differentchannelmembers ofafirm.

UNIT-I:INTRODUCTIONTOSALESMANAGEMENT

Introduction to Sales Management – Nature, Scope, Objectives and Functions of Sales Management.Types of Selling, Selling Skills, Selling Strategies, Selling Process. Sales Management Process,OrganizationofSales Department, Differenttypesof Sales Organizations.

UNIT-II:ANALYSISOFMARKETPOTENTIAL

Sales Management Cycle, Decision areas in Sales Management- Analysis of Market Potential, SalesPotential,SalesForecasting,SalesVolume, Sales Budgets,TimeandTerritoryManagement. EmergingtrendsinSalesManagement.

UNIT-III:SALESPLANNINGANDCONTROL

Sales Planning- Sales Forecasting & Budgeting, Sales Quotas and Targets. Sales Control-ReportingFormats for Primary and Secondary Sales, Monthly Sales Plan, Territory Sales and Coverage Plan,Daily Sales Call Report, Expired Goods and Breakage Return Report. Sales Audit-Sales ForceProductivityIndicators(Value and Volume), TerritoryProductivity.

UNIT-IV:SALESFORCERECRUITMENTANDSELECTION

Recruitment, Selection and Training of Sales force, Sales force motivation. Salesmen CompensationPlans,Control and Evaluation of PerformanceofSalesmen.

UNIT-V:DISTRIBUTIONMANAGEMENT

Channels of Distribution, Structures and Functions, Channel Design. Selecting Channel Members,Evaluating Channel Members, Motivating Channel members. Channel Conflicts-Reasons, stagesand types of Channel Conflict, resolving Channel Conflicts. Emerging trends in Distribution, GreenChannels,E-Channels, Omni Channel Management.

RecommendedBooks:

1. RichardR.Stire,EdwardW.CandiffandNorman,A.P.Gavani,SalesManagementDecisions,Policiesand Cases– PrenticeHall.
2. TapanKPanda–Sales&Distribution Management,OxfordUniversityPress.
3. S.L.Gupta,Sales andDistributionManagement,TextandCases,ExcelPublishers.
4. PingaliVenugopal,SalesandDistributionManagement:AnIndianPerspective,ResponseBooks,New Delhi.

SEMESTER-V

COURSE 12:ADVERTISINGMANAGEMENT

Theory Credits:4 4 hrs/week

CourseObjectives:

- Todevelopanawarenessofthemajortypes of advertisingandroleofAdagencies.
- TounderstandthebasicsofAdvertisingandmedia planning.
- Toknowtheimportanceofadvertisingbudgeting,advertisingagenciesandevaluatingadvertisingcampaigns.
- Toequipthestudentswiththeconcepts,typesandimportanceofbranding.
- Tolearnaboutbrandequity,brandevaluationandbrandmanagement.

UNIT-I:INTRODUCTIONTOADVERTISINGMANAGEMENT

Advertising-Meaning,ImportanceandobjectivesofAdvertising.History,ClassificationandFunctions. Role of Advertising in Promotional Mix, Types of Advertising, Integrated MarketingCommunication.DigitalAdvertising-Meaning,Advantages,Limitations,TypesofDigitalAdvertising.

UNIT-II:ADVERTISINGANDMEDIA PLANNING

Types of Advertising Appeals, Media – Objectives. Media Plan- Media Planning and Role of MediaPlanning. MarketAnalysis,Target Market Coverage,GeographicCoverage. Scheduling Creativeaspects,ReachandFrequency,DevelopingandImplementingMediaStrategies.MediamixDecisions,Evaluatingthe effectiveness.

UNIT-III:ADVERTISINGBUDGETANDADAGENCIES

AdvertisingBudgets,MethodsofFormulatingAdvertisingBudgets.EvaluatingAdvertisingEffectiveness(DAGMAR),AdvertisingAgencies,FunctionsofAdvertisingAgency,VariousFunctionalDepartments,Evaluation Criteria forselectingan AdvertisingAgency.
InternationalAdvertising, ImpactofCulture,Customs, LawsandRegulations,ethics.

UNIT-IV:BRANDING

Introduction to Branding, benefits, Types of Brands. Branding decisions, Brand Identity, BrandPersonality and Positioning, Brand repositioning. Product and Brand Extensions, Advantages ofExtensions,Disadvantages of Brand Extensions.

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UNIT-V:BRANDMANAGEMENT

MeasuringBrandEquity,EvaluatingBrandPerformance.DesigningBrandMarketingProgrammes,Branding in RetailBusiness, Role ofOwnLabel.

ReferenceBooks:

1. Kenneth Clow. Donald Baack, Integrated Advertisements, Promotion and Marketingcommunication,PrenticeHall ofIndia, NewDelhi.
2. S.H.H.Kazmi,SatishKBatra,Advertising&SalesPromotion,ExcelBooks,NewDelhi.
3. S A Chunawalla , Advertising, Sales & Promotions Management, Himalaya PublishingHouse.
4. U.C.Mathur,BrandManagement:TextandCases,Macmillan India Ltd.
5. StrategicBrandManagement,Kevin LaneKeller.Pearson.

SEMESTER-V

COURSE 13:TRAININGANDDEVELOPMENT

Theory Credits:4 4 hrs/week

CourseObjectives:

- Understandbasicconceptsassociatedwithlearningprocess,learningtheories,traininganddevelopment.
- Understandtrainingneeds,identificationoftrainingneeds,trainingprocesses,trainingmethods.
- Tofamiliarizewithevaluationdesign toassestrainingprogrameffectiveness.
- Emergingtrends in trainingand development.
- Relevance andusefulnessoftrainingexpertiseintheorganizationalworkenvironment.

UNIT-I:TRAININGANDDEVELOPMENT

Introduction to Training- Scope, Objectives and Importance.Beneficiaries of Training, Factorsinfluencing working and learning. Training Need Analysis, Training practices, Problems in Trainingprocess,emergingtrendsin training.

UNIT-II:STEPSINTRAININGPROGRAM

Need for Training and Development, Role of training managers – Administrators, Consultants,Designers and Instructors, Identification of training needs – Potential macro needs, - DesigningCompetencyBasedtrainingprograms.Evaluationoftrainingprograms-Evaluationprocess,Feedback mechanism, Methods of Training Evaluation, Training Effectiveness Models - KirkpatrickModelof TrainingEffectiveness, CIRO Model.

UNIT-III:TRAININGDESIGN

Introduction to Training Design, Factors affecting design of a training program, Designing a trainingmodule,IdentificationofTrainer,deigningtheTrainingSchedule,Preparingcontent,StudyMaterial.Budgetingfortraining,typesofcostinvolvedintrainingprograms.Identificationofalternative methods of instruction. Conduct of the Program- Physical arrangements, Creating climateforlearning, tips for effectiveimplementation.

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UNIT-IV:**TRAININGMETHODSANDTRAINER'SSTYLE**

Types of training- On-the-Job methods, Off-the -Job training methods (Job Instruction method, JobRotation Method, presentation methods, hands on methods, group building methods), choosing atraining method.Competence of trainer- Trainer's skills and style, Trainer's roles, Do's and Don'tsforTrainers.

UNIT-V:**DEVELOPMENT**

Executive Development- Need, importance of Training for Managers. Steps in the organization ofExecutiveDevelopmentPrograms,TechniquesofDevelopmentPrograms.DifferencebetweenTraining and Development, Career Development. Counselling- Meaning of Counselling, Process ofCounselling. Non- Directive Counselling, Evaluation of Counselling programs, Factors determiningEffectivenessof Counselling.

ReferenceBooks:

1. GaryDessler,HumanResourceManagement,PearsonEducation.
2. Noe,R.A.EmployeeTraining&Development.McGraw-Hill India.
3. AswathappaK,HumanResourcetoPersonnelManagement,TataMcGrawHill.
4. MamoriaC.BandMamoriaS. PersonnelManagement,HimalayaPublishingCompany.
5. Rolf,PandUdaiPareek,TrainingforDevelopment,SagePublicationsPvt. Ltd.

SEMESTER-V

COURSE 13:LABOURLEGISLATIONS

Theory Credits:4 4 hrs/week

CourseObjectives:

- Toacquireexpertknowledgeof Labour Laws
- TounderstandandapplicationofLabourLaws
- Todiscussthelegalframeworkof factoriesact
- Torealizetheprovisionforpaymentofwage
- ToInterpretthemechanismforresolvingindustrialdisputes

Syllabus

UNIT-I:ConstitutionandLabourLaws

Fundamental rights vis-à-vis labour laws, Equality before law and its application in Labour Laws,Equal pay for equal work; and Article-16 and reservation policies, Articles 19, 21, 23 and 24 and itsimplications.

UNIT-II:THEFACTORIES ACT1948

Definition, approval, licensing and registration, health and welfare measures (intra mural and extramural),employmentofwomenandyoungpersons,leavewithwagesandweeklyholidays.Amendment sin Factories Act 2013

UNIT-III:PAYMENT OFWAGESACT

Salient features, coverage of employees and employers, rules and benefits relating to The Payment ofWages Act 1936, The Payment of Gratuity Act 1972, The Minimum Wages Act 1948, The PaymentofBonus Act 1965.

UNITIV:TRADE UNIONACT 1926

Process of Obtaining Recognition for trade unions; Role of Trade Unions in Company; Immunitygranted to Registered Trade Unions, Recognition of Trade Unions. TheIndustrial Employment(Standing Orders) Act 1946, scope, coverage, certification process, modification, interpretation, andenforcement.TheIndustrial Disputes Act1947, forum for settlementof disputes.

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UNIT-V:LABOURCODES

CodeonWages2019;LabourCodeonIndustrialRelations2020;LabourCodeonSocialSecurity&Welfare;Labour Codeon Safety&WorkingConditions.

ReferenceBooks:

1. C.B.Mamoria, Mamoria&Gankar, Dynamics ofIndustrialRelations, HimalayaPublishingHousePvtLtd,
2. C.S.VenkatRatnam,IndustrialRelations,OxfordUniversityPress,NewDelhi.
3. Arun Monappa,IndustrialRelations, Tata McGraw Hill Publishing Company Limited,NewDelhi.
4. TNChhabra, IndustrialRelationsandLabourLaws,DhanpatRaiPublishingHouse,
5. SCSrivastava, Industrial Relationsand LabourLaws,VikasPublishingHouse.

SEMESTER-V

COURSE14:SECURITYANALYSISANDPORTFOLIOMANAGEMENT

Theory Credits:4 4 hrs/week

CourseObjectives:

- Understandthevarious forms of investment,securityMarketsand other concepts.
- Understandrisksassociatedwith investmentandto measuredifferentforms ofrisks
- Analysethefundamentalstrengthofstocksandpredictthepricetrendsofsecuritiesusingtechnicalanalysisand valuation ofstocksand fixed incomesecurities.
- Toanalysesthe stocksusingvarioustools oftechnical analysis.
- TounderstandvariousmodelsofportfolioManagementandevaluatetheperformanceofportfolio.

Syllabus

UNITI:CONCEPTOFINVESTMENT

Objectives – Investment Vs Speculation – Security Investment Vs Non-security Forms of Investment – InvestmentProcess–SourcesofInvestmentInformation–SecurityMarkets–PrimaryandSecondary –Indices.

UNITII:RETURN ANDRISK

MeaningandMeasurementofSecurityReturns–TypesofSecurityRisks–SystematicVsUnsystematicRisk– Measurement ofTotal Riskand Systematicrisk.

UNITIII:FUNDAMENTALANALYSIS OFSTOCKS

Economy,IndustryandCompanyAnalysis,IntrinsicValue– ApproachtoValuationofBonds,PreferenceShares andEquityShares.

UNITIV:TECHNICAL ANALYSIS

Concept and Tools of Technical Analysis: Dow Theory, Charts, Chart Patterns, Mathematicaltools(MA, EMA, ROC, RSI and MACD), Elliot Wave Theory, Market indicators – Technical Analysis VsFundamentalAnalysis–EfficientMarketHypothesis–Conceptand FormsofMarketEfficiency.

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UNITV:ELEMENTSOFPORTFOLIOMANAGEMENT

Portfolio Models– MarkowitzModel, EfficientFrontier, Sharpe SingleIndexModeland CapitalAssetPricing Model–PerformanceEvaluationofPortfolios–SharpeModel,Treynormodel–Jensen'sModel forPFEvaluation– Portfolio Revision.

ReferenceBooks:

1. FisherandJordan-SecurityAnalysis&PortfolioManagement,Pearson,PHI.
2. S.Kevin,SecurityAnalysis&PortfolioManagement,PrenticeHallIndia.
3. AvadhaniVA,Securities Analysis&PortfolioManagement,HimalayaPublishingHouse.
4. PrasannaChandra, InvestmentAnalysisandPortfolioManagement,TataMcGrawHillEducation.
5. P.Pandian,SecurityAnalysisandPortfolioManagement,VikasPublishingHousePvt.Limited.

SEMESTER-V

COURSE14:FINANCIALMARKETS

Theory Credits:4 4hrs/week

Courseobjectives:

- Togainconceptualknowledgeonfinancialsystemandmarkets.
- Tocomprehend thevarious moneymarket instruments.
- TounderstandCapitalMarketsandtheir Operations.
- Tounderstandconceptsrelatedto theforeignexchangemarket.
- Todevelopan understandingon derivativesmarket.

UNIT-I:INDIAN FINANCIALSYSTEM

Introduction-Importanceand functionsof Financial System- Structureof theIndian Financial System -Financialmarkets-Financialinstitutions-Financial Instruments-FinancialServices.

UNIT-II:MONEYMARKET:

Introduction-Definition of Money Market- Structure of Indian Money Market-Features of MoneyMarket-Composition of Money Market- Sub markets in the Indian Money Market-Money MarketInstruments-CommercialBills-FinanceBillsorUsancePromissoryNotes-TreasuryBills,Commercialpapers, Certificate ofDeposits,-Deficiencies ofMoneyMarket.

UNIT-III:CAPITAL MARKET:

Introduction- Meaning, Objectives and importance and Functions of Capital Markets – Structure ofIndian Capital Market – Growth of Indian Capital Market- Capital Market Instruments-IndustrialSecurities(OwnershipSecurities,CreditorshipSecurities)-GiltedgedSecurities(GovernmentSecurities,SemiGovernmentSecurities)-RegulationofCapitalMarket(SEBI)PrimaryMaryMarket(Functions,Methods andOperations ofNewIssue Market)-Secondarymarket(NSE)

UNIT-IV:FOREIGNEXCHANGE MARKET:

Features of Foreign Exchange Market-Functions and Organisation- Structure- Participants in theForeign exchange Market- Forex Exchange rates (Spot & Forward) -Theory of Purchasing PowerParity-Arbitrage.

UNIT-V:THEDERIVATIVESMARKETS:

Futures(Swapsandforwardcontracts)&Options-Derivativesmarkets(MEFF)-HedgingVsspeculatingwith derivatives.

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ReferenceBooks:

1. FinancialMarkets,InstitutionsandFinancialServices-CliffordGomez-PHILearningPrivateLimited.
2. L.M.Bhole,Financial InstitutionandMarkets,McGrawhill.
3. ShashiK.Gupta,Nisha AgarwalandNeetiGupta,Financial InstitutionsandMarket,KalyaniPublications.
4. T.R.Jain,R.L.Sarma- Indian FinancialSystem-VKGlobalpublisher.
5. JithendraGala -GuidetoIndianStock markets,BuzzingStockpublishinghouse.
6. SahaSiddhartha- IndianfinancialSystem-andMarkets -McGrawhillPublications.

SEMESTER-V

COURSE15:PRODUCTIONANDOPERATIONSMANAGEMENT

Theory Credits:4 4 hrs/week

Courseobjectives

1. Toequipthestudentswithconceptual knowledge onProductionandOperationsManagement
2. Toappreciatetheneed forselectingappropriatePlantlocationandlayout.
3. Tounderstand the needfor Capacityplanningandcontrolling.
4. Tounderstand theimportanceofProductivityandMaintenancemanagement.
5. Tocomprehendtheneedfor Inventorymanagementand Qualitymanagement.

Syllabus

UNITI:INTRODUCTION

Concept of Production and Operations Management, Nature and Scope of Production/OperationsManagement, Relationship with other Systems in the Organisation. Factors that affect productionSystem,DifferencebetweenManufacturingandServiceOperations,RoleofProductionandOperationsManager.

UNITII:FACILITYLOCATION

Facility Location- Importance, Factors effecting choice of Location, Location analysis techniques,FacilityLayout– Objectives, Basictypesof layouts, Advantages.

UNITIII:PRODUCTIONPLANNINGAND CONTROL

Production Planning & Control (PPC) –Concept, Objectives and Functions. Decisions relating toPPC.CapacityPlanning-FactorsaffectingCapacityPlanning, CapacityPlanningDecisions.

UNITIV:PRODUCTIVITY

Productivity-Definition,FactorsaffectingProductivity,WorkStudy-TimeStudy andMethodsStudy,Work Measurement, Control Charts, MaintenanceManagement.

UNITV:MATERIAL MANAGEMENTANDQUALITYMANAGEMENT

Significance of Material Management, Material Planning and Inventory Control. Inventory Models,Inventory costs, Basic EOQ Model, Re-order Level, ABC Analysis. Quality Control, Total QualityManagement.

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ReferenceBooks:

1. KAswathappa,ProductionandOperationsManagement,TataMcGrawHillsIndia.
2. Dr.B.S.Goel,Production&OperationsManagement,PragathiPrakashan,Meerut.
3. PankajMadan;ProductionandOperation Management,GlobalVisionPublishing.
4. RPanneerselvam,ProductionandOperationsManagement,PHI.

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SEMESTER-V

COURSE15:PROJECTMANAGEMENT

Theory Credits:4 4hrs/week

CourseObjectives:

- ToexposeStudentstotheconcepts ofprojectmanagementandplanning.
- Toenablestudentsidentifyandselectofprojectanditsfeasibility.
- Toequip thestudents withnetworkanalysistools andproject evaluationtechniques.
- Tomakethemunderstandaboutthehumanaspectsinmanagingtheprojectsinanorganisation.
- Demonstrateeffectiveprojectexecutionandcontroltechniquesthatresultinsuccessfulprojects.

UNIT-I:PROJECTMANAGEMENT

Definition of Project, Types of Projects. Project management –overview, significance of PM. ProjectLife Cycle-Project Initiation, Project Planning, Project Execution, Monitoring and Control, ProjectClosure.Typical projectmanagement issues.

UNIT-II:PROJECTPLANNINGANDSELECTION

Project planning process- Sources of new project ideas, Preliminary screening of projects. Initialprojectcoordination,Identificationanddeterminantsofcostofproject,itsfinancing.ProjectAppraisal , Feasibility studies- finance, technicaland market potential, Creating a Project ActionPlan,Creatingthe WorkBreak Down Structure.

UNIT-III:NETWORKANALYSISANDPROJECTEVALUATION

Project Network Analysis- PERT/CPM, Time estimates in Critical Path Analysis, Floats and ProjectTime–CostTrade-off inProjectTime Management.Projectevaluationmethods- Payback Period,NetPresent Value,Internal RateofReturnand ProjectEvaluation underuncertainty.

UNIT-IV:PROJECTORGANIZATION

Handling Human aspects of Project management, Roles and responsibilities of a Project Manager.Project Organization- The project as part of the Functional Organization, Pure Project Organization,TheMatrixorganization,Leadership Styles.

UNIT-V:PROJECTMONITORING

Designing the monitoring system, Project reporting,Measuring the performance of a project, RiskManagementProcess,ContingencyPlanning,ProjectCostManagement,ComputerizedProjectManagementSystems.

ReferenceBooks

1. GopalaKrishnan &RamaMurthy,ATextbookofProjectManagement, McMillan India
2. S.Choudhary,ProjectManagement,TataMcGrawHillPublication.
3. CliffordFGray,Project Management:TheManagerialProcess,OregonStateUniversity.
4. PrasannaChandra,"Projects,Planning,Analysis,Selection,Financing,ImplementationandReview",TataMcGrawHillCompanyPvt.Ltd.,NewDelhi 1998.
5. ErikLarson,CliffordGray.ProjectManagement.TheManagerialProcess.McGrawHillEducation.

SEMESTER-VII

COURSE16:SERVICEMARKETING

Theory Credits:4 4hrs/week

CourseObjectives:

- Todevelopanunderstandingonservicesectorandservices marketing.
- Tolearnabout theserviceprocessand elementsofservicesmarketingmix.
- Tounderstandand analysecustomerexpectations andperceptionstowardsservices.
- Toanalyzetheimpactof servicefailureanddevelopservicerecoverystrategies.
- Tounderstandthefunctional aspectsofvarious servicesectorunits.

UNIT-I:INTRODUCTIONSTOSERVICES:

Role of services in Indian economy, nature of services, reasons for growth in service sector, types ofservices, difference between goods and services, need for service marketing and obstacles in servicemarketing-Growth in Services– Global& IndianScenario.

UNIT-II:SERVICEMARKETINGMIX:

Marketingmanagementprocessforservices-selectingtargetmarket-developingtheservicemarketingmix-managingandcontrollingmarketingefforts.

UNIT-III:CUSTOMEREXPECTATIONSOFSERVICE:

Factors influencing customer expectations of service, issues involving customer service expectations,Customerperception ofservice.

UNIT-IV:SERVICEQUALITY,SERVICERECOVERY:

Impactofservicefailureandrecovery,customerrespondstoservicefailure.Servicerecoverystrategies,servi ceguarantee-Servicequalityissues andthe human dimensionin Services.

UNIT-V:MARKETINGOFSERVICES:

BankingandInsurance,Healthcare,Hospitalityservices,retailservices-
Businessprocessoutsourcing(BPO).

ReferenceBooks:

1. K.RamMohanRao,ServiceMarketing,PearsonEducation.

2.VasantVenugopalandRaghuN,ServicesMarketing,HimalayaPublishingHouse.

3. P.N.Reddy, ServicesMarketing, HimalayaPublishingHouse.

4. SMJha,ServicesMarketing,HimalayaPublishingHouse.

SEMESTER-VII

COURSE16:BRAND MANAGEMENT

Theory Credits:4 4hrs/week

COURSEOBJECTIVES:

- Tounderstandthemethods ofmanagingbrands
- ToUnderstandstrategiesforbrandmanagement.
- Tostudyhow brand communication is donebyorganisations.
- Tosuccessfullyestablishandsustain brands andlead to extensions.
- Tounderstandthebrandperformanceinmoderndigitalworld

UNIT-IINTRODUCTION:

BasicsUnderstandingofBrands–Definitions-BrandingConcepts–FunctionsofBrand-SignificanceofBrands–Different Types ofBrands– Co branding– Storebrands.

UNIT-IIBRANDSTRATEGIES:

Strategic Brand Management process – Building a strong brand – Brand positioning – EstablishingBrand values – Brand vision – Brand Elements – Branding for Global Markets – Competing withforeignbrands.

UNIT-IIIBRANDCOMMUNICATIONS:

Brand image Building – Brand Loyalty programmes – Brand Promotion Methods – Role of Brandambassadors,celebraties– On line Brand Promotions.

UNIT-IVBRAND EXTENSION:

Brand Adoption Practices – Different type of brand extension – Factors influencing Decision forextension– Re-branding and re-launching.

UNIT-V:BRANDPERFORMANCE:

Measuring Brand Performance – Brand Equity Management - Global Branding strategies - BrandAudit–BrandEquityMeasurement–BrandLeverage-RoleofBrandManagers–Brandingchallenges&opportunities.

ReferenceBooks:

1. BrandingConcepts andProcess byPati D,Publisher: Macmillan
2. BrandPositioningbySubroto Sen Gupta, Publisher: TataMcGraw-Hill
3. ProductManagementinIndiabyR.C.Majumdar, Publisher:Prentice-hallofIndiaPvtLtd.
4. KevinLaneKeller,StrategicBrandManagement:Building,MeasuringandManaging,PrenticeHall ,
5. MoorthiYLR,BrandManagement–Iedition, VikasPublishingHouse

SEMESTER-VII

COURSE17:FINANCIALDERIVATIES

Theory Credits:4 4hrs/week

Courseobjectives

- Togainknowledgeaboutvariousinstruments
- Tolearnaboutforwardcontractsandadvantages, disadvantages
- Tounderstandaboutfuturecontracts,mechanicsoffuturecontracts,advantagesanddisadvantages
- Tolearnabouthistorical usesofoptionsand typesofoptions
- Knowledgeregardingfinancialswaps

UNIT1: INTRODUCTION:

MeaningofDerivatives-CommonDerivatives-CharacteristicsofDerivatives-SignificanceofDerivatives-Origin and Evolution of Derivatives– types of derivatives- Derivatives vs. SharesDerivativesMarkets-Growth and Functions-Tradersin Derivatives Markets.

UNIT2:FORWARDCONTRACTS:

Meaning–Classification-Features-Advantages-Disadvantages-PricingForwardsContracts-Hedgingwith Forward Contracts OffsettingtheForwardPosition.

UNIT3:FUTURESCONTRACTS:

Meaning -Nature - Characteristics - Significance - Types- Comparison between Futures and Badla - Mechanics of Futures Contracts- Advantages and Risks of Trading in Futures over Cash-MarginRequirementsinFuturesTrading-Settlementof FuturesPosition-ParticipantsinFutures Markets.

UNIT4:OPTIONSCONTRACTS:

Meaning-HistoricalUsesofOptions-TypesofOption-ParticipantsintheOptionsMarket–RegulatoryFrameworks&Terminology-Options vs. Futures.

UNIT5:FINANCIAL SWAPS:

Meaning –Nature-Evolution - Features – Types of swaps: Interest Rate Swaps-currency swaps-DebtEquitySwap-CommoditySwap–EquityIndexSwaps.

ReferenceBooks:

1. FinancialDerivatives: BishnupriyaMishra,SathyaSwaroopDebasish–ExcelBooks2007
2. FinancialDerivatives:S.L.Gupta–PHIpublications
3. Fundamentalsof FinancialDerivatives: PrafullaKumarSwain–Himalayapublications.

SEMESTER-VII

COURSE17:FINANCIALSERVICES

Theory Credits:4 4hrs/week

CourseObjectives:

- Todevelopanunderstandingonregulatoryframeworkof financialservicesinIndia.
- Toenablethestudenttounderstandandevaluatethefeebasedandfundbased financial
- services
- TogainknowledgeonfunctionsofMerchantBanker.
- TounderstandingHousingFinanceCompanies andguidelinesfor Housingfinance.

UNIT-I:FINANCIALSERVICES:

Nature-scope and objectives financial services-Types of financial services. Regulatory Framework ofFinancialservicesGrowthoffinancialservicesinIndia.ProblemsoffinancialservicesinIndia.

UNIT-II:MERCHANTBANKING:

MeaningandTypes–RoleandresponsibilitiesofMerchantBankersinIssueManagement-Underwritingguidelines-RegulationsofMerchantBankinginIndia.Creditrating–Meaning,functions-debt ratingsystem ofCRISIL,ICRA and CARE.

UNIT–III:LEASING:

Types of Lease, Structuring and Funding of Leases -Advantages and disadvantages of leasing, LeaseEvaluation (Basic Problems), Hire Purchase Agreements- Evaluation of Hire purchase Agreements.MutualFunds,

UNIT–IV:VENTURECAPITALFINANCING:

Features,Processofventurefinancing-ModesofVentureCapitalAssistance-FactoringandForfeiting:Meaning,-TheoreticalFrame work, factoringservices inIndia.

UNIT–V:HOUSINGFINANCE:

National Housing Bank (NHB), NHB's Housing Finance Companies- Need and nature- Fixed andFloating Rate HomeLoans-Sources of Housing Finance inIndia. Growth of housing financeinIndia-Role of National Housing Bank-Concept of Mortgage and Reverse Mortgage-Housing loansandMortgageLoans-Types of MortgageLoans.

RecommendedBooks:

1. MYKhan,FinancialServices –TMHPublishers.
2. VasantDesai,FinancialMarkets&FinancialServices,HimalayaPublishingHouse,Mumbai
3. Siddiah.T,FinancialServices,Pearson

4. TripatiNaliniPrava,FinancialServices,PrenticeHallofIndia
5. Guruswami.S,FinancialServices,TataMcGrawHillPvtLtd,NewDelhi
6. V.A.Avadhani,IndianCapitalMarket-Himalaya Publishinghouse.

SEMESTER-VII

COURSE18:PERFORMANCEMANAGEMENT

Theory Credits:4 4 hrs/week

CourseObjectives:

- ToacquireknowledgeofPerformanceManagement.
- Togain anunderstandingaboutperformancemanagementsystem.
- TounderstandRewardSystemsandlegalissues.
- ToEvaluateRewardSystemsandHighPerformingTeams
- ToApplyModernperformancemeasurementframeworks

UNITI:INTRODUCTIONTOPERFORMANCEMANAGEMENT:

Definition,ScopeandSignificance-AdvantagesofPerformanceManagement-OrganizationalStructure - Impact of Organizational structure and Operational Problems Performance managementprocess - Performance Planning - Performance Appraisal - Performance Mentoring - PerformanceManagementStrategicPlanning.

UNITII:COMMUNICATIONOFPERFORMANCEEXPECTATIONS:

Job Description - Defining Performance and Choosing a measurement approach measuring resultsandBehaviors.GatheringperformanceInformation– Presentation,InformationandTakingCorrective action–Metrics- Types of Metrics- Critical Success FactorsIndicators– managingMetrics-Ownership andResponsibility.

UNITIII:PERFORMANCEMANAGEMENTANDEMPLOYEEDEVELOPMENT:

PerformanceManagementSkills,performanceManagementFramework,EmployeeAssessmentsystem,Role ofHR Professionals inPerformancemanagement.

UNITIV:REWARDSYSTEMSANDLEGALISSUESANDHIGHPERFORMINGTEAMS:

ReasonsforintroducingcontingentPayPlan,Problemsassociatedwithcontingentpayplans-Selecting a contingent pay plan- Pay Structures- Job Evaluation- Broad Banding- Legal Principlesaffecting Performance Management - Building and leading High performing teams - team orientedorganizations-developingand leadinghigh performingteams.

UNITV:MODERNPERFORMANCEMEASUREMENTFRAMEWORKS:

BenchMarking,SixSigma;PerformancePrism,ForcedrankingBalancedScoreCard.Contemporary issues in performance management. Studying the impact of change in organization'sstructure,cultureandstrategy ontheadoptionofnewperformancemeasurementmethodsandtechniques.Methods of PMS -Appraisal, Communication and Interview, Performance feedback andcounselling,Talent Management.

ReferenceBooks:

1. HermanAguinis,PerformanceManagement,PearsonEducation.
2. LanceA. BergerandDorothy,TheTalentManagement HandBook.Tata Mc-GrawHill.
3. RaoT.V,Appraisingand DevelopingManagerial Performance.ExcelBooks.
4. DixitVarsha,PerformanceManagement.VrindaPubilcationsLtd

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SEMESTER-VII

COURSE18:COMPENSATIONMANAGEMENT

Theory Credits:4 4 hrs/week

CourseObjectives:

1. Todiscusstheprinciplesandimportanceofcompensationmanagement
2. Torelatethebasesofcompensation
3. Toappraisethepresenttrendsincalculationofincentivesandotherpaysystem
4. Todevelopanddesigncompensationsystem
5. Toidentifythecontemporarycompensationpractices

UNITI:INTRODUCTIONTOCOMPENSATIONMANAGEMENT

Introduction–DefinitionofCompensationManagement-objectivesofcompensation–Principlesof Compensation Management – Importance of CompensationManagement - Types of wages.ExploringandDefiningthecompensationcontext–Intrinsiccompensation-Extrinsiccompensation--Compensation TrendsinIndia.-The3-Pcompensationconcept

UNITII:COMPENSATIONPLANNING&BASESOFCOMPENSATION:

Compensation and itscomponents -CompensationPlanning:Level,Structure and SystemsDecision – Compensation level planning- factors influencing compensation level planning : internal factorsandexternalfactors.TraditionalBasesforPay-SenioritvandLongevityPay-MeritPay-Performance Appraisal- Methods- Biases -Strengthening the Pay for Performance Link-PossibleLimitationsof Merit PayProgramme

UNITIII:INCENTIVEPAY&OTHERPAYSYSTEMS:

Exploring Incentive Pay- Contrasting Incentive Pay with Traditional Pay. Individual Incentives- Types of Individual Incentives- Advantages and Disadvantages. Group Incentives- Types of GroupIncentives- Advantages and Disadvantages. Companywide Incentives- Types- Designing IncentivePay Programmes. Person Focused Pay- Competency Based Pay, Pay for Knowledgeand SkillBasedPay, team based pay-Concepts.

UNITIV:DESIGNINGCOMPENSATIONSYSTEM:

BuildinginternallyconsistentCompensationSystem -Creating Internal EquitythroughJobAnalysisandJobValuation - BuildingMarketCompetitiveCompensationSystem–compensationsurveys-IntegratingInternalJobStructureswithExternalMarket-Building Pay Structures that Recognize Individual Contribution : Constructing pay structure. Paystructurevariations – Broad banding-two tierpaystructure.

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UNITV:CONTEMPORARYSTRATEGICCOMPENSATION:

Internationalcompensation–componentsofinternationalcompensation–Executivecompensation –componentsofexecutive compensation- CompensatingtheFlexible WorkforceContingentEmployees–coreandfringecompensation.

ReferenceBooks:

1. DipakKumarBhattacharya,CompensationManagement,OxfordUniversityPress.
2. Richard.I.Henderson:CompensationManagementInAKnowledgeBasedWorld-Prentice-Hall.
3. Milkovich&NewMan,Compensation,TataMcGraw–Hill,NewDelhi.
4. TapomoyDeb,CompensationManagementtext&cases,ExcelPublication.
5. JosephJ.Martocchio,StrategicCompensation-AHumanResourceManagementApproach-PearsonEducation.

SEMESTER-VIII

COURSE21:GLOBALMARKETINGMANAGEMENT

Theory Credits:4 4hrs/week

CourseObjectives:

- Tounderstandthe variousfactors thatinfluencethebusinessatgloballevel.
- Toanalysethestrategicsegmentation,targetingandpositioning(STP)processatgloballevel.
- Toanalysethemarketingmixstrategyatgloballevel.
- Tounderstandtheeffectiveglobalchannelsofdistribution.
- Tounderstandthevariouspromotionalstrategiesglobally.

UNIT-I:INTRODUCTION:

GlobalMarketingConcept:Nature,EvolutionandScopeofGlobalMarketing,ManagementOrientations (EPRG Framework), Global Environment: Economic, Socio-Cultural, Technological,Ecological,Political and Legal Environment.

UNIT-II:STPSTRATEGIES:

Global Market Segmentation, Targeting and Positioning, Criteria for Global Market Selection, BasicModes of Entry into Foreign Markets,GlobalProduct Strategies: Ansoff Matrix, New ProductDevelopmentatGlobalLevel,GlobalProductLifeCycle,BuildingGlobalBrands.

UNIT-III:GLOBALPRICING:

Objectives, Factors influencing Global pricing, Pricing Methods, Pricing Strategies, Transfer Pricing,Issuesin Global PriceSetting.

UNIT-IV:GLOBALDISTRIBUTIONANDLOGISTICS:

GlobalChannelFunctions,StructureofGlobalDistributionSystems,CriteriaforChannelDesign.

UNIT-V:INTERNATIONALPROMOTIONALPOLICY:

International Promotion, Concept, Strategies, International advertising, International SalesPromotion,Sales forceand theirmanagement, other formsofpromotionfor global markets.

ReferenceBooks:

1. Keifer Lee,SteveCarter,GlobalMarketingManagement,OxfordUniversityPress.

2. WareenJ.Keegan,NavalK.Bhargava,GlobalMarketingManagement,PearsonEducation.

3. Jean-PierreJennet

&H.DavidHennessey,GlobalMarketingStrategies,WileyIndia,Delhi.

4. Vasudeva:InternationalMarketing,ExcelPublications.

SEMESTER-VIII

COURSE21:INDUSTRIALMARKETING

Theory Credits:4 4hrs/week

COURSEOBJECTIVES:

- Toprovide thestudentswithin depthknowledge ofindustrial marketstructure
- ToprovidestudentswithunderstandingofthevariousattributesandmodelsapplicableinIndustrialMarketing.
- Toidentifytheplanningprocessinindustrial marketing.
- Toanalyzetheindustrialmarketenvironment.
- Toanalyzethedeterminantsofpricinganddecisionmaking.

UNIT-1:BASICOFINDUSTRIALMARKETING:

Conceptofindustrialmarketing—AttributesofMarketingStrategy—ConceptofIndustrialMarketing—DefinitionofIndustrialMarketing—TypesofProduct—IndustrialProduct—TypesofIndustrialCustomers—CommercialEnterprises—IndustrialDistributorsandDealers—OriginalEquipment Manufacturers (OEMs)—Government Customers—Institutions—Cooperative Societies**UNIT-2:INDUSTRIALBUYINGBEHAVIOUR:**

Organisational Buying —Features of Organisational Buying—Types of buying Situation—StraightRebuy—ModifiedRebuy—Newtask—Systembuy—BuyingCenterConcept—TheBuyingDecisionProcess.

UNIT-3:PRICINGININDUSTRIALMARKETING:

Pricing Environment—Characteristics of Price—The Pricing ProcessinIndustrial Marketing—Factorsaffectingindustrialpricingdecision—PricingObjectives—MarketSkimming—MarketPenetration—ProductDifferentiation—Other pricingobjectives.

UNIT-4:INDUSTRIAL DISTRIBUTIONCHANNEL:

Marketing Channels Physical Distribution—Factors Affecting the Nature of Industrial Channels—GeographicDistribution—ChannelSize—CharacteristicsofIntermediaries—MixedSystem—StructureofIndustrialChannel—DirectChannel—IndirectChannel—TypesofIndustrialMiddlemen/Intermediaries—IndustrialDistributors

UNIT-5:SALESPROMOTIONSININDUSTRIALMARKETING:

MeaningandDefinition—NeedforSalesPromotion—MethodsofSalesPromotion—TradeShows—PublicRelations—Publicity–Catalogs—PromotionalLetters—Samples—SalesContests—Entertainment—PromotionalNovelties—Demonstration—DirectMarketing—DirectMail—Telemarketing—Online marketingchannels.

ReferenceBooks:

1. IndustrialMarketing:AProcessofCreatingandMaintainingExchangebyKrishnamacharyuluCsg,Lalitha R, Publisher: Jaico Book House
2. IndustrialMarketingbyGhosh,Publisher: Oxford UniversityPress
3. IndustrialMarketing2ebyK.K.Havaldar,Publisher:TataMcGraw-HillPublishingCompanylimited
4. IndustrialMarketingManagementbyGovindarajan, Publisher:Vikas PublishingHousePvtLtd.
5. IndustrialMarketingbyPhadtareM.T,Publisher:PrenticeHallofIndiaPrivate Limited

SEMESTER-VIII

COURSE22:INVESTMENTMANAGEMENT

Theory Credits:4 4hrs/week

CourseObjectives:

- Tofamiliarizestudents withvarious formsofinvestment
- Tounderstandthe functioningof securitiesmarkets.
- Toevaluatethe riskand returnassociated withsecurities.
- Toacquireknowledgeonvaluationofsecurities.
- Toanalysethesecuritiesusingfundamentalandtechnicalanalysis.

UNIT-I:INVESTMENT:

Definition-Investment attributes, Objectives of Investment, Investment Vs Speculation, Features ofGood Investment,InvestmentProcess-InvestmentInstruments–Types.

Unit-II:SECURITIESMARKET:

Primary Market - Issue Management-Pre and Post Issue Management-Secondary Market-MajorPlayers in the secondary market, Functioning of Stock Exchanges-Leading Stock Exchanges in India.**UNIT-III:RISKANDRETURN CONCEPTS:**

Meaning-Elements of Risk-SystematicRisk, UnsystematicRisk, Calculation ofRisk and Return.

UNIT-IV:VALUATIONOFSECURITIES:

Equity shares- Valuation, Dividend Valuation models(problems), Bond Valuation(Problems), BondDuration(Theory).

UNIT-V:SECURITYANALYSIS:

FundamentalAnalysis,CompanyAnalysis,IndustryAnalysis,EconomicAnalysis,TechnicalAnalysis.Theories:Dow Theory,Eliotwave theory,Charts-Types,TrendsandTrendReversalPatterns–Movingaverages, ROC, RSI, MarketIndicators.

ReferenceBooks:

1. PrasannaChandra, InvestmentAnalysisandPortfoliomanagement,TMH.
2. PunithavathyPandian,SecurityAnalysis& PortfolioManagement, VikasPublications.
3. FisherandJordan,SecurityAnalysis&PortfolioManagement,Pearson.
4. KevinS,SecurityAnalysis&PortfolioManagement,PHI.
5. FrankK.Reilly,KeithC.Brown, InvestmentAnalysis &PortfolioManagement,Cengage.

SEMESTER-VIII

COURSE22:INTERNATIONALFINANCIALMANAGAMENT

Theory Credits:4 4hrs/week

Courseobjectives

- Tounderstandthetermsand theoriesofinternationaltrade
- Toensuretheknowledgeaboutbalanceofpayments,importancealsoaccountingprinciplesinBOP
- Tolearnaboutforeignexchangemarkets,understandingSPOTandforward rates
- Togainknowledgeaboutexchangeratediscrimination
- TounderstandvariousinstrumentslikeEurocurrenciesetc.,

UNIT1: INTRODUCTION:

SpotAndForwardRates,ForeignExchangeQuotations-PremiumInternationalTrade-ItsImportance –TheoriesOfInternationalTrade–TheoryComparativeCosts–ClassicalTheory,AbsoluteAdvantage, Hecksher – Ohlin Theory, Free Trade V/S Protection Barriers To Foreign Trade, TariffAndNon Tariff Barriers.

UNIT2:BALANCEOFPAYMENT:

Meaning Of Bop, Components Of Bop – Importance Of Bop – Meaning Of Deficit and Surplus – Equilibrium–DisequilibriumAndAdjustments–MethodsOfCorrectingDisequilibrium– AccountingPrinciplesInBop.

UNIT3:FOREIGNEXCHANGEMARKETS:

Define Foreign Exchange Markets – Its Structure – Settlement System –Exchange Rate – Participants,UnderstandingandDiscountInForward Market- Cross Rates- InverseRatesandArbitrage.

UNIT4:EXCHANGERATEDISCRIMINATION:

DeterminationUnderGoldStandardAndPaperStandard-FactorsAffectingExchangeRates–Purchasing Power Parity Theory- Demand And Supply Theory- Equilibrium Rate Of Exchange – FluctuatingV/S.FixedExchangeRates,ExchangeControl-ExchangeControl-ObjectivesOfExchangeControl.

UNIT5:INSTRUMENTS:

ADR- GDR- Euro Currencies- International Commercial Papers. International Financial Institutions – IntroductionToImf –Importance–Functions AndSignificance.

ReferenceBooks:

1. V.K.Bhalla-InternationalFinancialManagement-S.Chand.

2. P.G.Apte-InternationalFinancialManagement- McGrawHill.
3. T.Siddaiah-InternationalFinancialManagament -Pearson.
4. VyuptakeshSharan -InternationalFinancialManagement -PHIPublications

SEMESTER-

VIIICOURSE23:LABOURWELFARE

Theory Credits:4 4hrs/week

CourseObjectives:

- ToacquaintthestudentswithspeciallawspertainingtoLabourWelfare
- Tostudythe demand andsupplyandaspects effectinglabourwelfare
- Tounderstandvariousvulnerable groups ofworkersandlegal provisionsrelatedtothem.
- Toawareabouttheworkingconditionsofworkersandlegalprovisionsrelatedtotheaccidentsand hazards.
- Tounderstandvariousagenciesinvolvedinlabour welfare

UNIT1:LABOURWELFARE:

Concept–Objectives–Scope–Need–VoluntaryWelfareMeasures–StatutoryWelfareMeasures –Theories of Labour Welfare- Evolution of Labour Welfare in India. Principles and approaches.Provisionsfor Labour welfare contentin theConstitution of India

UNIT2:LABOURMARKETS:

Features, Demand and Supply of Labour, Nature and Characteristics of Labour Markets in India.- Labour Market Policies, Mobility of Labour -Socio-Economic aspects affecting Labour welfare,Productivity &Living standardoflabour-FactorsdeterminingLabourForce-LabourForce&HumanDevelopment inIndia.

UNIT3:WELFARE OFSPECIALCATEGORIESOFLABOUR:

Child Labour – Female Labour – Contract Labour – Construction Labour – Agricultural Labour – Differently abled Labour –BPO & KPO Labour – Social Assistance – Social Security – Implications.**UNIT-4:AGENCIESOFLABOURWELFARE**

Agencies of Labour welfare in India- State, Employer, Trade Unions, Voluntary Organisations - LabourWelfareOfficer:roleandfunctions-LabourAdministrationinIndia-WelfareFunds–Educationand TrainingSchemes.

UNIT-5:INDUSTRIAL SAFETY:

CausesofAccidents–Prevention–SafetyProvisions–IndustrialHealthandHygiene–Importance –Problems–OccupationalHazards–Diseases–Psychologicalproblems–Counselling– StatutoryProvisions.Fatigue,Frustration.

ReferenceBooks:

1. A.M.Sarma–AspectsofLabourwelfare&SocialSecurity–HimalayaPublications.

2. Punekar &Deodhar–LabourwelfareTataMCGrawHillPublishing.
3. Misra&Puri–IndianEconomy–HimalayaPublications.
4. Dutt&Sundharam -Indian EconomyS.ChandPublication.

SEMESTER-VIII

COURSE23:INDUSTRIALSAFETY

Theory Credits:4 4hrs/week

CourseObjectives:

- Toachieve anunderstandingof principlesof safetymanagement.
- Toenablethestudentstolearn aboutvariousfunctions andactivitiesofsafetydepartment.
- Toenablestudentstoconductsafetyauditandwriteauditreportseffectivelyinauditingsituations.
- Tohaveknowledgeaboutsources ofinformationfor safetypromotion andtraining.
- Tofamiliarizestudentswith evaluationofsafetyperformance.

UNIT-1:INTRODUCTIONTOINDUSTRIALSAFETY:

Need for safety, Safety legislation: Acts and rules, Safety standards and codes, Safety policy: safetyorganization and responsibilities and authorities of different levels. Accident sequence theory, Natureof Accident, Process of accident, Causes of accidents, Accident prevention and control techniques,Plantsafetyinspections, Job safetyAnalysis andinvestigation ofaccidents.

UNIT-2:SAFETYEDUCATION:

Importance of training-identification of training needs-training methods – programmes, seminars,conferences, competitions – method of promoting safe practice - motivation – communication - roleof government agencies and private consulting agencies in safety training – creating awareness,awards, celebrations, safety posters, safety displays, safety pledge, safety incentive scheme, safetycampaign.

UNIT-3:TRAININGPROGRAMS:

In-Plant andOut-of–Plant Training.Seminars, workshops. Safety Induction Programfor newrecruitsandworkforce.ToolboxTalk.Jobinstructionsvs.SafetyInstructions-EmployeeParticipationin Safety-Safetycommitteeand union participation:

UNIT-4:ACCIDENT PREVENTION:

Definition : Incident, Accident, Injury , Dangerous occurrence ,Unsafe Act, Unsafe, Conditions,Hazards,Error,Oversight,Mistake ,Near Miss,Electricity & Hazards,Of Electricity,ExplosivesAnd,Transportation Safety.

UNIT-5:SAFETYAUDIT:

Components of safety audit, types of audit, audit methodology, non-conformity reporting (NCR),audit checklist and report – review of inspection, remarks by government agencies, consultants,experts–perusalofaccidentandsafetyrecords,formats–implementationofauditindication-

liaisonwithdepartmentstoensureco-ordination–checklist–identificationofunsafeactsofworkers and unsafeconditions in theshop floor.

ReferenceBooks:

1. BlakeR.B.,“IndustrialSafety”PrenticeHall,Inc., NewJersey,.3rdEdition.
2. DanPetersen, “TechniquesofSafetyManagement”,McGraw-HillCompany, Tokyo.
3. HeinrichH.W.“IndustrialAccidentPrevention”McGraw-HillCompany,NewYork.
4. IndustrialSafety,HealthandEnvironmentManagementSystems,Prof.SunilS.Rao&R.K.Jain,KhannaPublishing
5. PrinciplesofIndustrialSafetyManagement,DasAkhilKumar,PHIPublishing.

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AndhraPradeshStateCouncilofHigherEducation

B.Sc.,Honoursin ComputerScienceMAJOR

w.e.fAY2023-24 onwards

COURSESTRUCTURE

Year	Semester	Course	Title	Hrs./ Week	Credits
I	I	1	EssentialsandapplicationsofMathematical, PhysicalandChemicalSciences	5	4
		2	AdvancesinMathematical,Physicaland ChemicalSciences	5	4
	II	3	ProblemSolvingusingC-(T)	3	3
			ProblemSolvingusingC-(P)	2	1
		4	DigitalLogicDesign-(T)	3	3
			DigitalLogicDesign-(P)	2	1
II	III	5	ObjectOrientedProgrammingusingJava-(T)	3	3
			ObjectOrientedProgrammingusingJava -(P)	2	1
		6	DataStructuresusing C -(T)	3	3
			DataStructuresusingC -(P)	2	1
		7	ComputerOrganization-(T)	3	3
			ComputerOrganization-(P)	2	1
		8	OperatingSystems -(T)	3	3
			OperatingSystems -(P)	2	1
	IV	9	DatabaseManagementSystem-(T)	3	3
			DatabaseManagementSystem-(P)	2	1
		10	ObjectOrientedSoftwareEngineering-(T)	3	3
			ObjectOrientedSoftwareEngineering -(P)	2	1
		11	DataCommunicationsandComputerNetworks -(T)	3	3
			DataCommunicationsandComputerNetworks -(P)	2	1
III	V	12	WebInterfaceDesigningTechnologies-(T)	3	3
			WebInterfaceDesigningTechnologies-(P)	2	1
		13	WebApplicationsDevelopmentusingPHP& MYSQL-(T)	3	3
			WebApplicationsDevelopmentusingPHP& MYSQL-(P)	2	1
		14A	InternetofThings (T)	3	3
			InternetofThings (P)	2	1
			OR		
		14 B	FoundationsofDataScience -(T)	3	3

			FoundationsofDataScience -(P)	2	1
		15A	IoT Applications Development and Programming-(T)	3	3
			IoT Applications Development and Programming-(P)	2	1
			OR		
		15 B	Applicationdevelopmentusing Python-(T)	3	3
			ApplicationdevelopmentusingPython-(P)	2	1
	VI		Internship/Apprenticeship		
IV	VII	16A	AdvancedDataStructures -(T)	3	3
			AdvancedDataStructures -(P)	2	1
			OR		
		16 B	ArtificialIntelligence-(T)	3	3
			ArtificialIntelligence -(P)	2	1
		17A	ComputerGraphics-(T)	3	3
			ComputerGraphics-(P)	2	1
			OR		
		17 B	DesignandAnalysisofAlgorithms -(T)	3	3
			DesignandAnalysisofAlgorithms -(P)	2	1
		18A	PrinciplesofMachineLearning-(T)	3	3
			PrinciplesofMachineLearning-(P)	2	1
			OR		
		18 B	SoftwareTesting-(T)	3	3
			SoftwareTesting-(P)	2	1
	SEC	19A	AdvancedJavaProgramming -(T)	3	3
			AdvancedJavaProgramming-(P)	2	1
			OR		
		19 B	MobileApplicationDevelopment-(T)	3	3
			MobileApplication Development-(P)	2	1
		20A	MEANStackDevelopment-(T)	3	3
			MEANStackDevelopment-(P)	2	1
			OR		
		20 B	RProgramming-(T)	3	3
			RProgramming-(P)	2	1
	VIII	21A	BigDataTechnologies-(T)	3	3
			BigDataTechnologies-(P)	2	1
			OR		
		21 B	CompilerDesign-(T)	3	3
			CompilerDesign-(P)	2	1
		22A	DataMiningConcepts&Techniques-(T)	3	3
			DataMiningConcepts&Techniques-(P)	2	1
			OR		
			DigitalImageProcessing -(T)	3	3

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		22 B	DigitalImageProcessing -(P)	2	1

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		23A	InformationSecurityandCryptography -(T)	3	3
			InformationSecurityandCryptography -(P)	2	1
			OR		
		23 B	MobileADHOCandSensorNetworks -(T)	3	3
			MobileADHOCandSensorNetworks -(P)	2	1
	SEC	24A	AdvancedDBMS-(T)	3	3
			AdvancedDBMS-(P)	2	1
			OR		
		24 B	CloudComputing-(T)	3	3
			CloudComputing-(P)	2	1
		25A	ComputerVision-(T)	3	3
			ComputerVision-(P)	2	1
			OR		
		25 B	DigitalForensics-(T)	3	3
			DigitalForensics-(P)	2	1

I SEMESTER

COURSE 1 : ESSENTIALS AND APPLICATIONS OF MATHEMATICAL, PHYSICALANDCHEMICALSCIENCES

Hours:5hrs/week Credits: 4

CourseObjective:

The objective of this course is to provide students with a comprehensive understanding of theessential concepts and applications of mathematical, physical, and chemical sciences. The courseaims to develop students' critical thinking, problem-solving, and analytical skills in these areas,enablingthemto applyscientific principlesto real-world situations.

Learningoutcomes:

1. Applycriticalthinkingskillstosolvecomplexproblemsinvolvingcomplexnumbers,trigonometricratios, vectors, andstatisticalmeasures.
2. ToExplainthebasicprinciplesandconceptsunderlyingabroadrangeoffundamentalareasofphysics andto Connecttheirknowledge of physics toeveryday situations
3. ToExplainthebasicprinciplesandconceptsunderlyingabroadrangeoffundamentalareasofchemistryand toConnecttheirknowledge ofchemistrytodaily life.
4. Understandtheinterplayandconnectionsbetweenmathematics,physics,andchemistryinvarious applications.Recognizehowmathematicalmodelsand physical andchemical
5. principlescanbeusedtoexplainandpredict phenomenaindifferent contexts.
6. ToexplorethehistoryandevolutionoftheInternetandtogainanunderstandingofnetworksecurityconcepts,includingthreats,vulnerabilities,andcountermeasures.

UNITI:ESSENTIALSOF MATHEMATICS:9hrs

Complex Numbers: Introduction of the new symbol i – General form of a complex number – Modulus-Amplitudeformand conversions

Trigonometric Ratios: Trigonometric Ratios and their relations – Problems on calculation ofangles Vectors: Definition of vector addition – Cartesian form – Scalar and vector product andproblemsStatisticalMeasures:Mean, Median, Modeofa dataand problems

UNITII:ESSENTIALSOFPHYSICS:9hrs

Definition andScope of Physics- Measurementsand Units- Motion ofobjects:NewtonianMechanics and relativistic mechanics perspective - Laws of Thermodynamics and Significance-Acoustic waves and electromagnetic waves- Electric and Magnetic fields and their interactions-Behaviourofatomicandnuclearparticles-Wave-particleduality,theuncertaintyprinciple-Theoriesand understandingof universe

UNITIII: ESSENTIALSOFCHEMISTRY::9hrs

Definition and Scope of Chemistry- Importance of Chemistry in daily life -Branches of chemistryand significance- Periodic Table- Electronic Configuration, chemical changes, classification ofmatter,Biomolecules-carbohydrates, proteins,fatsand vitamins.

UNITIV:APPLICATIONSOFMATHEMATICS,PHYSICS&CHEMISTRY:9hrs

ApplicationsofMathematicsinPhysics&Chemistry:Calculus,DifferentialEquations&ComplexAnalysis

Application of Physics in Industry and Technology: Electronics and Semiconductor Industry,RoboticsandAutomation,AutomotiveandAerospaceIndustries,QualityControlandInstrumentation,EnvironmentalMonitoringandSustainableTechnologies.

ApplicationofChemistryinIndustryandTechnology:ChemicalManufacturing,Pharmaceuticalsand DrugDiscovery,MaterialsScience, Foodand BeverageIndustry.

UNITV:ESSENTIALSOFCOMPUTERSCIENCE:

Milestonesofcomputerevolution-Internet,history,InternetServiceProviders,TypesofNetworks,IP, Domain Name Services,applications.

Ethicalandsocialimplications:Networkandsecurityconcepts-InformationAssuranceFundamentals,Cryptography-SymmetricandAsymmetric,Malware,Firewalls,FraudTechniques-Privacy and Data Protection

Recommendedbooks:

1. Functionsofone complexvariable byJohn.B.Conway,Springer-Verlag.
2. ElementaryTrigonometrybyH.S.HallandS.R.Knight
3. VectorAlgebrabyA.R.Vasishtha,KrishnaPrakashanMedia(P)Ltd.4.BasicStatisticsbyB.L.Agarwal,New ageinternationalPublishers
4. UniversityPhysicswithModernPhysicsbyHughD.YoungandRoger A.Freedman
5. FundamentalsofPhysicsbyDavidHalliday,RobertResnick,andJearlWalker
6. PhysicsforScientistsandEngineerswithModernPhysics"byRaymondA.SerwayandJohn W. JewettJr.
7. PhysicsforTechnologyandEngineering" byJohnBird
8. ChemistryindailylifebyKirpal Singh
9. ChemistryofbiomoleculesbyS.P.Bhutan
10. Fundamentalsof ComputersbyV.RajaRaman
11. CyberSecurityEssentialsbyJamesGraham,RichardHoward,RyanOlson

STUDENTACTIVITIES
UNITI:ESSENTIALSOFMATHEMATICS:

1:ComplexNumberExplorationProvidestudentswithasetofcomplexnumbersinbothrectangular and polar forms.They will plot the complex numbers on the complex plane andidentifytheir properties

2:TrigonometricRatiosProblemSolvingGivestudentsasetofproblemsthatrequirethecalculationof trigonometricratiosandtheirrelations.

Students will solve the problems using the appropriate trigonometric functions (sine, cosine,tangent,etc.) and trigonometricidentities.

3:VectorOperationsandApplications Providestudentswithaset ofvectorsinCartesianform.

Students will perform vector addition and subtraction operations to find the resultant vectors.Theywillalso calculatethescalarand vector productsof givenvectors.

4:StatisticalMeasuresandDataAnalysisGivestudentsadatasetcontainingnumericalvalues.

Students will calculate the mean, median, and mode of the data, as well as other statisticalmeasuresif appropriate (e.g., range, standarddeviation).

They will interpret the results and analyze the central tendencies and distribution of the

data.UNITII:ESSENTIALSOF PHYSICS:

ConceptMapping

Dividestudentsintogroupsandassigneach grouponeof thetopics.

Studentswillcreateaconceptmapillustratingthekeyconcepts,relationships,andapplicationsrelatedtoth eirassigned topic.

Encouragestudentstousevisualelements,arrows,

andlabelstorepresentconnectionsandinterdependenciesbetweenconcepts.

LaboratoryExperiment

Selectalaboratoryexperimentrelatedtooneofthetopics,suchasmotionofobjectsorelectricandmagnetic fields.

Providethenecessarymaterials,instructions,andsafetyguidelinesforconductingtheexperiment.

Studentswillworkinsmallgroupstocarryouttheexperiment,collectdata,andanalyzetheresults.

After the experiment, students will write a lab report summarizing their findings, observations,andconclusions.

UNITIII:ESSENTIALSOFCHEMISTRY

1:ChemistryinDailyLifePresentation

Divide students into groups and assign each group a specific aspect of daily life where chemistryplaysasignificantrole,suchasfoodandnutrition,householdproducts,medicine,orenvironmental issues.

Studentswillresearchandcreateapresentation(e.g.,PowerPoint,poster,orvideo)thatshowcasestheimportanceof chemistryintheir assigned aspect.

2:PeriodicTableExploration

Providestudentswithacopyoftheperiodictable.

Students will explore the periodic table and its significance in organizing elements based on theirproperties.

They will identify and analyze trends in atomic structure, such as electronic configuration, atomicsize, andionization energy.

3:ChemicalChangesandClassificationofMatter

Provide students with various substances and chemical reactions, such as mixing acids and basesorobservinga combustionreaction.

Students will observe and describe the chemical changes that occur, including changes in color,temperature,ortheformation of new substances.

4:BiomoleculesInvestigation

Assigneachstudentorgroupaspecificbiomoleculecategory,suchascarbohydrates,proteins,fats,orvitamins.

Studentswillresearchandgatherinformationabouttheirassignedbiomoleculecategory,includingitsstructure,functions, sources,and importancein thehuman body.

They can create informative posters or presentations to present their findings to the class.UNITIV:APPLICATIONSOFMATHEMATICS, PHYSICS&CHEMISTRY

1:InterdisciplinaryCaseStudies

Dividestudentsintosmallgroupsandprovidethemwithinterdisciplinarycasestudiesthatinvolvetheinterdisciplinary applicationofmathematics, physics,andchemistry.

Eachcasestudyshouldpresentareal-worldproblemorscenariothatrequirestheintegrationofconceptsfromallthreedisciplines.

2:DesignandInnovationProject

Challengestudentstodesignanddevelopapracticalsolutionorinnovationthatintegratesmathematics,physics, andchemistryprinciples.

Studentscanchooseaspecificproblemorareaofinterest,suchasrenewableenergy,environmental conservation, ormaterials science.

3:LaboratoryExperiments

Assignstudentslaboratoryexperimentsthatdemonstratethepracticalapplicationsofmathematics, physics, andchemistry.

Examplesincludeinvestigatingtherelationshipbetweenconcentrationandreactionrate,analyzingthebehaviorofelectricalcircuits,ormeasuringthepropertiesofmaterials.

.4:MathematicalModeling

Present students with real-world problems that require mathematical modeling and analysis.UNITV:ESSENTIALSOF COMPUTERSCIENCE:

Identifying the attributes of network (Topology, service provider, IP address and bandwidth ofyourcollegenetwork) andpreparea reportcoveringnetworkarchitecture.

Identify the types of malwares and required firewalls to provide security.Latest Fraudtechniquesused by hacke

ISemester

Course2:ADVANCESINMATHEMATICAL,PHYSICALANDCHEMICALSCIENCES

Hours:5 hrs/week Credits:4

CourseObjective:

The objective of this course is to provide students with an in-depth understanding of the recent advances andcutting-edge research in mathematical, physical, and chemical sciences. The course aims to broaden students'knowledge beyond the foundational concepts and expose them to the latest developments in these disciplines,fosteringcritical thinking,researchskills,andtheability tocontributetoscientificadvancements.

Learningoutcomes:

Exploretheapplicationsofmathematicsinvariousfieldsofphysicsandchemistry,tounderstandhowmathematicalcon cepts areusedtomodelandsolvereal-world problems.

To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and toConnecttheir knowledgeofphysicsto everyday situations.

Understandthedifferentsourcesofrenewableenergyandtheirgenerationprocessesandadvancesinnanomaterials and their properties, with a focus on quantum dots. To study the emerging field of quantumcommunication and its potential applications. To gain an understanding of the principles of biophysics instudyingbiological systems. Explorethe propertiesandapplicationsof shapememorymaterials.

Understand the principles and techniques used in computer-aided drug design and drug delivery systems, tounderstand the fabrication techniques and working principles of nanosensors. Explore the effects of chemicalpollutantson ecosystemsand human health.

Understand the interplay and connections between mathematics, physics, and chemistry in various advancedapplications. Recognize how mathematical models and physical and chemical principles can be used to explainandpredictphenomena indifferentcontexts.

5 Understand and convert between different number systems, such as binary, octal, decimal, and hexadecimal.Differentiatebetweenanalogganddigitalsignalsandunderstandtheircharacteristics.Gainknowledgeofd ifferent types of transmission media, such as wired (e.g., copper cables, fiber optics) and wireless (e.g., radiowaves,microwave, satellite)..

UNITI: ADVANCESINBASICSMATHEMATICS 9hrs

Straight Lines: Different forms – Reduction of general equation into various forms–Point of intersection oftwostraightlines

Limits and Differentiation: Standard limits – Derivative of a function –Problems on product rule and quotientrule

Integration:Integrationasareverseprocessofdifferentiation–Basicmethodsofintegration

Matrices: Types of matrices – Scalar multiple of a matrix – Multiplication of matrices – Transpose of a matrixanddeterminants

UNITII:ADVANCESINPHYSICS: 9hrs

Renewable energy: Generation, energy storage, and energy-efficient materials and devices. Recent advances inthe field of nanotechnology: Quantum dots, Quantum Communication- recent advances in biophysics-recentadvancesinmedicalphysics-Shape MemoryMaterials.

UNITIII:ADVANCESINCHEMISTRY: 9hrs

Computer aided drug design and delivery, nano sensors, Chemical Biology, impact of chemical pollutants onecosystemsand human health, Dyeremoval-Catalysismethod

UNITIV:ADVANCEDAPPLICATIONSOFMATHEMATICS,PHYSICS&CHEMISTRY 9hrs

MathematicalModellingapplicationsinphysicsandchemistryApplicationofRenewableenergy:GridIntegrationand SmartGrids,Application ofnanotechnology: Nanomedicine,

Application of biophysics: Biophysical Imaging, Biomechanics,

Neurophysics,Applicationofmedical

physics:RadiationTherapy,Nuclearmedicine

Solid waste management, Environmental remediation- Green Technology, Water

treatment.UNITV:Advanced Applications ofcomputer Science9hrs

NumberSystem-Binary,Octal,decimal,andHexadecimal,Signals-Analog,Digital,Modem,Codec,Multiplexing, Transmission media, error detection and correction- Parity check and CRC, Networking devices-Repeater,hub, bridge, switch, router, gateway.

Recommendedbooks:

1. CoordinateGeometrybyS.L.Lony,ArihantPublications
2. CalculusbyThomasandFinny, PearsonPublications
3. MatricesbyA.R.VasishthaandA.K.Vasishtha,KrishnaPrakashanMedia(P)Ltd.
4. "RenewableEnergy: Powerfora SustainableFuture"byGodfreyBoyle
5. "EnergyStorage:ANontechnicalGuide"byRichardBaxter
6. "Nanotechnology:PrinciplesandApplications"bySulabhaK.KulkarniandRaghvendraA.Bohara
7. "Biophysics:AnIntroduction"byRodneyCotterill

8. "MedicalPhysics: Imaging"byJamesG.Webster
9. "ShapeMemoryAlloys:PropertiesandApplications"byDimitrisC.Lagoudas
10. NanomaterialsandapplicationsbyM.N.Borah
11. EnvironmentalChemistrybyAnil.K.D.E.
12. Digital LogicDesignbyMorrisMano
13. DataCommunication&Networking byBahrouzForouzan.

STUDENTACTIVITIES
UNITI:ADVANCESINBASICMATHEMATICS
1:StraightLinesExploration
Providestudentswithasetofequationsrepresentingstraightlinesindifferentforms,suchasslope-interceptform,point-slopeform,orgeneralform.
Studentswillexplorethepropertiesandcharacteristicsofstraightlines,includingtheirslopes,intercepts,andpoint ofintersection.
2:LimitsandDifferentiationProblem Solving
Studentswill applytheconceptoflimitsto solvevarious problemsusingstandardlimits.
Encouragestudentstointerprettheresultsandmakeconnectionstoreal-worldapplications,suchasanalyzingratesof change or optimizing functions.
3:IntegrationExploration
Students willexploretheconceptofintegration asareverseprocessofdifferentiationand applybasic methodsofintegration, such astheproductrule,substitution method,or integrationbyparts.
Studentscandiscussthesignificanceofintegrationinvariousfields,suchasphysicsandchemistry4: MatricesManipulation
Students will perform operations on matrices, including scalar multiplication, matrix multiplication, and matrixtranspose.
Studentscanapplytheirknowledgeofmatricestoreal-worldapplications,suchassolvingsystemsofequationsorrepresentingtransformations ingeometry.
UNITII:ADVANCESINPHYSICS:
1:CaseStudies
Providestudentswithreal-worldcasestudiesrelatedtorenewableenergy,nanotechnology,biophysics,medical physics, or shapememorymaterials.
Studentswillanalyzethecasestudies,identifythechallengesorproblemspresented,andproposeinnovativesolutionsbased on the recentadvancesin the respective field.
They will consider factors such as energy generation, energy storage, efficiency,sustainability,materialsdesign,biomedicalapplications,ortechnologicaladvancements.

2:ExperimentalDesign

Assignstudentstodesignandconductexperimentsrelatedtooneofthetopics:renewableenergy,nanotechnology,biophysics, medicalphysics,orshape memory materials.

Theywillidentifyaspecificresearchquestionorproblemtoinvestigateanddesignanexperimentaccordingly.Studentswill collectandanalyzedata,interpret the results,anddrawconclusionsbasedon theirfindings.

Theywill discusstheimplicationsoftheirexperimental resultsinthecontextofrecent advancesinthefield.3: Group Discussionand Debate

Organizeagroupdiscussionordebatesessionwherestudentswilldiscusstheethical,social,andenvironmental implications of the recent advances in renewable energy, nanotechnology, biophysics, medicalphysics,and shapememorymaterials.

Assign students specific roles, such as proponent, opponent, or moderator, and provide them with key pointsandarguments to supporttheirpositions.

UNITIII:ADVANCESINCHEMISTRY:

ExperimentalDesignandSimulation

Insmall groups,studentswill designexperimentsorsimulationsrelatedtotheassignedtopic.

Forexample,inthecontextofcomputer-aideddrugdesign,studentscoulddesignavirtualscreeningexperiment toidentifypotentialdrugcandidatesfora specific diseasetarget.

Fornanosensors,studentscoulddesignanexperimenttodemonstratethesensitivityandselectivityofnanosensorsin detecting specific analytes.

Chemicalbiology-relatedactivitiescouldinvolvedesigningexperimentstostudyenzyme-substrateinteractionsormolecular interactions inbiologicalsystems.

Studentswillperformtheirexperimentsorsimulations,collectdata,analyzetheresults,anddrawconclusionsbasedon their findings.

CaseStudiesandDiscussion

Provide students with real-world case studies related to the impact of chemical pollutants on ecosystems andhumanhealth.

Students will analyze the case studies, identify the sources and effects of chemical pollutants, and proposemitigationstrategiestominimizetheirimpact.

Encourage discussions on the ethical and environmental considerations when dealing with chemical pollutants.For the dye removal using the catalysis method, students can explore case studies where catalytic processes areusedto degrade orremovedyesfromwastewater.

Students will discuss the principles of catalysis, the advantages and limitations of the catalysis method, and itsapplicationsin environmentalremediation.

3:GroupProject

Assignstudentsto workingroupsto developa projectrelated toone of thetopics.

Theprojectcouldinvolvedesigningacomputer-aideddrugdeliverysystem,developingananosensorforaspecificapplication,orproposingstrategiestomitigatetheimpact ofchemicalpollutantsonecosystems.

Studentswilldevelopadetailedprojectplan,conductexperimentsorsimulations,analyzedata,andpresenttheirfindings andrecommendations.

Encouragecreativity,criticalthinking,andcollaborationthroughouttheproject.

UNITIV:ADVANCEDAPPLICATIONSOFMATHEMATICS,PHYSICS&CHEMISTRY

1:MathematicalModellingExperiment

Provide students with a mathematical modelling experiment related to one of the topics. For example, in thecontext of renewable energy, students can develop a mathematical model to optimize the placement andconfigurationof solar panels in asolarfarm.

Students will work in teams to design and conduct the experiment, collect data, and analyze the results usingmathematicalmodelsandstatisticaltechniques.

Theywill discusstheaccuracyandlimitationsoftheirmodel,proposeimprovements,and interprettheimplicationsoftheirfindingsinthecontext ofrenewableenergyorthespecificapplicationarea.2: Case Studiesand GroupDiscussions

Assignstudentstoanalyzecasestudiesrelatedtotheapplicationsofmathematicalmodellinginnanotechnology, biophysics, medical physics, solid waste management, environmental remediation, or watertreatment.

Students will discuss the mathematical models and computational methods used in the case studies, analyze theoutcomes,andevaluatetheeffectiveness ofthemodelling approach.

Encourage group discussions on the challenges, ethical considerations, and potential advancements in the field.Students will present their findings and engage in critical discussions on the advantages and limitations ofmathematicalmodelling insolving complexproblemsin these areas.

GroupProject

Assign students to work in groups to develop a group project that integrates mathematical modelling with oneoftheapplicationareas:renewableenergy,nanotechnology,biophysics,medicalphysics,solidwastemanagement, environmentalremediation, or watertreatment.

The project could involve developing a mathematical model to optimize the delivery of radiation therapy inmedical physicsordesigning amathematicalmodeltooptimizewastemanagementpractices.

Students will plan and execute their project, apply mathematical modelling techniques, analyze the results, andpresenttheirfindings and recommendations.

Encouragecreativity,criticalthinking,andcollaborationthroughouttheproject.

UNITV:AdvancedApplicationsofcomputerScience

Students must be able to convert numbers from other number system to binary number systemsIdentifythe networkingmedia usedfor yourcollege network

Identifyallthenetworkingdevicesusedinyourcollegepremises.

IISemester

Course3:ProblemSolvingusingC

Credits-3

CourseObjectives

1. Toexplorebasicknowledgeoncomputers
2. Learnhowtosolvecommontypesofcomputingproblems.
3. Learntomapproblems toprogrammingfeaturesofC.
4. LearntowritegoodportableCprograms.

CourseOutcomes

Uponsuccessfulcompletion ofthecourse,astudentwill beableto:

1. UnderstandtheworkingofadigitalcomputerandFundamentalconstructsofProgramming
2. Analyzeanddevelop asolution toagivenproblem withsuitablecontrolstructures
3. Applythederived datatypes inprogramsolutions
4. Usethe‘C’languageconstructs in theright way
5. ApplytheDynamicMemoryManagementforeffectivememoryutilization

UNIT-I

Introduction to computer and programming: Introduction, Basic block diagram and functions ofvarious components of computer, Concepts of Hardware and software, Types of software, Compilerand interpreter, Concepts of Machine level, Assembly level and high-levelprogramming, FlowchartsandAlgorithms

Fundamentals of C: History of C, Features of C, C Tokens-variables and keywords and identifiers,constants and Data types, Rules for constructing variable names, Operators, Structure of C program,Input/outputstatements in C-Formatted andUnformattedI/O

UNIT-II

Control statements: Decision making statements: if, if else, else if ladder, switch statements. Loopcontrol statements: while loop, for loop and do-while loop. Jump Control statements: break,continueand goto.

UNIT-III

Derived data types in C: Arrays: One Dimensional arrays - Declaration, Initialization and Memoryrepresentation; TwoDimensionalarrays-Declaration,InitializationandMemoryrepresentation.

Strings:Declaring&Initializingstringvariables;Stringhandlingfunctions,Characterhandlingfunctions

UNIT-IV

Functions: FunctionPrototype,definitionandcalling.Returnstatement.Nestingoffunctions.Categories of functions. Recursion, Parameter Passing by address & by value. Local and Globalvariables.**Storageclasses**: automatic, external, staticandregister.

Pointers: Pointerdatatype,Pointerdeclaration,initialization,accessingvaluesusingpointers.Pointerarithmetic. Pointers and arrays,pointersand functions.

UNIT-V

DynamicMemoryManagement: Introduction,Functions-malloc,calloc,realloc,free**Structures:** Basicsofstructure,structuremembers,accessingstructuremembers,nestedstructures,arrayof

structures,structure andfunctions,structuresandpointers.**Unions**-Union definition; differencebetweenStructures andUnions.

TextBooks:

1. E.Balagurusamy,"ProgramminginANSIC",TataMcGrawHill,6thEdn,ISBN-13:978-1-25-90046-2
2. HerbertSchildt,—CompleteReferencewithC,TataMcGrawHill,4thEdn.,ISBN-13:9780070411838, 2000
3. Computer fundamentals and programming in C, REEMA THAREJA, OXFORDUNIVERSITYPRESS

ReferenceBooks

1. EBalagurusamy,COMPUTINGFUNDAMENTALS&CPROGRAMMING – TataMcGraw-Hill,Second Reprint 2008,ISBN978-0-07-066909-3.
2. AshokNKamthane,Programmingwith ANSIandTurboC, PearsonEdition Publ,2002.
3. Henry Mullish&Huubert L.Cooper: The Spirit of C An Introduction to modernProgramming, Jaico Pub. House,1996.
4. Ykanithkar,letusCBPB,13th edition-2013,ISBN:978-8183331630,656pages.

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity: Quizoncomputerhardwareandsoftwareconcepts

EvaluationMethod: Objective-basedquizassessingknowledgeandunderstanding

Unit2:Activity: Problem-solvingusingDecision-MakingStatements

EvaluationMethod: Correctnessofdecision-makinglogic

Unit3:Activity: ArrayandString ProgramDebugging

EvaluationMethod: Identificationandcorrectionoferrorsincode

Unit4:Activity: PairProgrammingExerciseonFunctions

EvaluationMethod: CollaborationandCodeQuality

Unit5:Activity: StructuredProgramming Assignment

EvaluationMethod: Appropriateuseofstructuresandnestedstructures

IISemester

Course3:ProblemSolvingusingC

Credits-1

ListofExperiments

1. A.Writeaprogramto calculate simple& compoundinterest
   B.WriteaCprogram tointerchangetwonumbers.
2. Findthebiggestof threenumbersusingC.
3. Writeacprogramtofind thesum ofindividualdigitsof apositiveinteger.
4. AFibonaccisequenceisdefinedasfollows:thefirstandsecondtermsinthesequenceare0and1. Subsequentterms arefoundbyaddingtheprecedingtwoterms inthesequence.
5. WriteacprogramtocheckwhetheranumberisArmstrongornot.
6. Writeacprogramtogeneratealltheprimenumbersbetween1andn,wherenisavaluesupplied bytheuser.
7. Writeacprogramthat implements searching of givenitemingiven list
8. Writeacprogramthatusesfunctionstoperformthefollowing:Additionoftwomatrices.Multiplic ationof two matrices.
9. Writeaprogramfor concatenationoftwo strings.
10. Writeaprogramforlength ofastringwithand without StringHandling functions
11. Writeaprogram todemonstrateCallbyValueandCall byReferencemechanism
12. WriteaProgramtofindGCDofTwo numbersusingRecursion
13. Writeacprogram toperformvariousoperations usingpointers.
14. Writeacprogramtoreaddataof10employeeswithastructureof1.employeeid2.aadarno,3.title, 4.joineddate,5.salary, 6.date ofbirth, 7.gender, 8.department.
15. WriteaProgramtodemonstratedynamicarraysusingDynamicMemoryManagementfunctions

IISemester

Course4:DigitalLogicDesign

Credits-3

CourseObjectives

Tofamiliarizewiththeconcepts ofdesigningdigitalcircuits.

CourseOutcomes

Uponsuccessfulcompletion ofthecourse,the students will beableto

1. UnderstandhowtoConvertnumbersfromoneradixtoanotherradixandperformarithmeticoperations.
2. SimplifyBooleanfunctionsusingBooleanalgebra andk-maps
3. Designaddersandsubtractorscircuits
4. Design combinational logic circuits such as decoders, encoders, multiplexers anddemultiplexers.
5. Useflipflopstodesignregistersandcounters.

UNIT– I

Number Systems: Binary, octal, decimal, hexadecimal number systems, conversion of numbers fromone radix to another radix, r's, (r-1)'s complements, signed binary numbers, addition and subtractionofunsigned and signed numbers, weighted and unweightedcodes.

UNIT– II

Logic Gates and Boolean Algebra: NOT, AND, OR, universal gates, X-OR and X-NOR gates,Boolean laws and theorems, complement and dual of a logic function, canonical and standard forms,two level realization of logic functions using universal gates, minimizations of logic functions (POSandSOP) using Booleantheorems, K-map(upto four variables),don't careconditions.

UNIT– III

Combinational Logic Circuits – 1: Design of half adder, full adder, half subtractor, fullsubtractor,rippleaddersand subtractors,rippleadder / subtractor.

UNIT– IV

Combinational Logic Circuits – 2: Design of decoders, encoders, priority encoder, multiplexers,demultiplexers,higherorderdecoders,demultiplexersandmultiplexers,realizationofBooleanfunctionsusing decoders,multiplexers.

UNIT– V

Sequential Logic Circuits: Classification of sequential circuits, latch and flip-flop, RS- latch usingNANDandNORGates,truthtables,RS,JK,TandDflip-flops,truthandexcitationtables,conversionofflip-flops, flip-flopswith asynchronous inputs (presetandclear).

Design of registers, shift registers, bidirectional shift registers, universal shift register, designofripplecounters, synchronous counters and variablemoduluscounters.

TextBooks:

1.M.MorrisMano,MichaelDCiletti, “DigitalDesign”,5thedition,PEA.

ReferenceBooks

1. Kohavi,Jha,“SwitchingandFiniteAutomataTheory”,3rdedition,Cambridge.
2. 2.Leach,Malvino,Saha, “DigitalPrinciplesandApplications”,7thedition,TMH.
3. 3.Roth,“FundamentalsofLogicDesign”,5thedition,Cengage.

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity:JAM(Justa Minute)Session: Explaining RadixConversion

EvaluationMethod: CommunicationSkills andKnowledgePresentation

Unit2:Activity: Boolean AlgebraAssignment

EvaluationMethod: AssignmentCompletionandCorrectness

Unit3:Activity: Hands-onLabActivity:BuildingAdderandSubtractorCircuits

EvaluationMethod: LabPerformanceandCorrectnessofCircuit Implementation

Unit4:Activity: Group Discussion:ApplicationsofDecoders,Encoders, Multiplexers

EvaluationMethod: ParticipationandCriticalThinking

Unit5:Activity: QuizonFlip-FlopsandRegister-CounterDesign

EvaluationMethod: QuizPerformanceandKnowledgeRetention

II SemesterCourse

4:DigitalLogicDesign

Credits-1

ListofExperiments

Thelaboratoryworkcanbedonebyusingphysical gates andnecessaryequipment orsimulators.

Simulators: https://sourceforge.net/projects/gatesim/or https://circuitverse.org/or any free open-sourcesimulator

1. Introduction to digital electronics lab- nomenclature of digital ICs, specifications, study ofthe data sheet, concept of Vcc and ground, verification of the truth tables of logic gatesusingTTLICs.
2. ImplementationofthegivenBooleanfunctionsusinglogicgatesinbothSOPandPOSforms
3. Realizationofbasicgatesusinguniversal gates.
4. Designandimplementation ofhalfandfulladder circuitsusinglogicgates.
5. Designandimplementationofhalfandfullsubtractorcircuitsusinglogicgates.
6. VerificationofstabletablesofRS,JK,TandDflip-flopsusingNANDgates.
7. VerificationofstabletablesofRS,JK,Tand Dflip-flopsusingNORgates.

8. Implementationandverificationof Decoderandencoderusinglogicgates.
9. Implementationof4X1MUXandDeMUXusinglogicgates.
10. Implementationof8X1MUXusingsuitablelowerorderMUX.
11. Implementationof7-segmentdecodercircuit.
12. Implementationof4-bitparalleladder.
13. Designandverificationof4-bitsynchronouscounter.
14. Designandverificationof4-bitasynchronouscounter.

III **Semester**

Course5:ObjectOrientedProgrammingusingJava

Credits-3

CourseObjectives

Tointroducethefundamentalconceptsof Object-Orientedprogrammingandtodesign&implementobject-orientedprogramming concepts in Java.

CourseOutcomes

Uponsuccessfulcompletion ofthecourse,astudentwill beableto:

1. UnderstandthebasicconceptsofObject-OrientedProgrammingandJavaProgramConstructs
2. Implement classesandobjectsandanalyzeInheritanceandDynamicMethodDispatch
3. Demonstratevariousclassesindifferentpackagesandcandesignownpackages
4. ManageExceptions andApplyThreads
5. CreateGUIscreens alongwitheventhandling

UNIT-I

OOPs Concepts and Java Programming: Introduction to Object-Oriented concepts, proceduralandobject-orientedprogramming paradigm

Javaprogramming:AnOverviewofJava,JavaEnvironment,Datatypes,Variables,constants,scope and life time of variables, operators, type conversion and casting, Accepting Input from theKeyboard, Reading Input with Java.util.Scanner Class, Displaying Output with System.out.printf(),DisplayingFormatted Outputwith String.format(),Control Statements

UNIT-II

Arrays,CommandLineArguments, Strings-StringClassMethods

Classes & Objects: Creating Classes, declaring objects, Methods, parameter passing, static fieldsandmethods,Constructors, and 'this'keyword, overloadingmethods andaccess

Inheritance: Inheritance hierarchies, super and subclasses, member access rules, 'super' keyword,preventing inheritance: final classes and methods, the object class and its methods; **Polymorphism**:Dynamicbinding, method overriding, abstractclassesandmethods;

UNIT-III

Interface: Interfaces VS Abstract classes, defining an interface, implement interfaces, accessingimplementations throughinterface references, extending interface;

Packages:Defining,creatingandaccessingapackage,understandingCLASSPATH,importingpackages.

Exception Handling: Benefits of exception handling, the classification of exceptions, exceptionhierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws andfinally, rethrowing exceptions, exception specification, built in exceptions, creating own exceptionsubclasses.

UNIT-IV

Multithreading: Differences between multiple processes and multiple threads, thread states, threadlife cycle, creating threads, interrupting threads, thread priorities, synchronizing threads, inter threadcommunication.

Stream based I/O (java.io) – The Stream classes-Byte streams and Character streams, Readingconsole Input and Writing Console Output, File class, Reading and writing Files, The Console class,Serialization

UNIT-V

GUIProgrammingwithSwing-Introduction,MVCarchitecture,components,containers.Understanding Layout Managers - Flow Layout, Border Layout, Grid Layout, Card Layout, GridBagLayout.

EventHandling-TheDelegationeventmodel-Events,Eventsources,EventListeners,Eventclasses, Handling mouse and keyboard events, Adapter classes, Inner classes, Anonymous Innerclasses.

TextBooks:

1. JavaThecompletereference,9thedition,HerbertSchildt,McGrawHill.
2. Understanding Object-Oriented Programming with Java, updated edition, T.Budd,PearsonEducation.

ReferenceBooks

1. CayS.Horstmann,"CoreJavaFundamentals",Volume1,11thEdition,PrenticeHall,2018.
2. PaulDeitel,HarveyDeitel,"JavaSE8forprogrammers",3rdEdition,Pearson,2015.
3. S.Malhotra,S.Chudhary,ProgramminginJava,2ndedition,OxfordUniv.Press.

SUGGESTEDCO-CURRICULARACTIVITIES &EVALUATIONMETHODS:

Unit1:Activity: QuizonObject-OrientedProgrammingConcepts andJavaConstructs

EvaluationMethod: QuizPerformanceandKnowledgeRetention

Unit2:Activity: Object-OrientedProgrammingAssignment: ClassImplementation

EvaluationMethod: AssignmentCompletionandCorrectness

Unit3:Activity: Hands-onLabActivity: CreatingandUsingCustomJavaPackages

EvaluationMethod: LabPerformanceandCorrectnessofCodeImplementation

Unit4:Activity: CaseStudy Discussiononwheremulti-threadingiscrucial

EvaluationMethod: Criticalthinking,problem-solving,andpresentationskills.

Unit5:Activity:GUIdesign contest usingJavaSwings

EvaluationMethod:GUIdesign,Visualappearanceanduserfriendliness,usability,andadherencet oevent handling principles.

IIISemester

Course5:ObjectOrientedProgrammingusingJava Lab

Credits-1

ListofExperiments

1. WriteaJavaprogramto print Fibonacciseriesusing forloop.
2. WriteaJavaprogramtocalculatemultiplication of2matrices.
3. Create a class Rectangle. The class has attributes length and width. It should have methods thatcalculate the perimeter and area of the rectangle. It should have read Attributes method to readlengthandwidth from user.
4. WriteaJavaprogramthat implementsmethodoverloading.
5. WriteaJavaprogram for sortinga given listofnames inascendingorder.
6. WriteaJavaprogramthat displaysthenumberofcharacters,linesandwords in atext file.
7. WriteaJavaprogramtoimplement various typesofinheritance

   i. Single ii.Multi-Level iii.Hierarchical iv.Hybrid
8. Writeajavaprogram toimplementruntime polymorphism.
9. Write a Java program which accepts withdraw amount from the user and throws an exception "InSufficientFunds"whenwithdrawamountmorethanavailable amount.
10. Write a Java program to create three threads and that displays "good morning", for every onesecond, "hello" for every 2 seconds and "welcome" for every 3 seconds by using extending Threadclass.
11. Write a Java program that creates three threads. First thread displays "OOPS", the second threaddisplays"Through"and thethirdthreadDisplays"JAVA"by usingRunnable interface.
12. Implement a Java program for handling mouse events when the mouse entered, exited, clicked,pressed,released,dragged and moved in theclientarea.
13. ImplementaJavaprogramforhandling keyeventswhenthekey boardispressed,released,typed.
14. Write a Java swing program that reads two numbers from two separate text fields and display sumoftwo numbers in third text field when button"add"is pressed.
15. Write a Java program to design student registration form using Swing Controls. The form whichhavingthefollowing fields and button SAVE

    FormFieldsare:Name,RNO,Mailid,Gender,Branch,Address.

IIISemester

Course6:DataStructuresusingC

Credits-3

CourseObjectives

Tointroducethefundamentalconceptofdatastructuresandtoemphasizetheimportanceofvariousdata structures indeveloping and implementing efficientalgorithms.

CourseOutcomes

Uponsuccessfulcompletion ofthecourse,astudentwill beableto:

1. UnderstandvariousData Structuresfordatastorageandprocessing.
2. RealizeLinkedListData Structureforvariousoperations
3. Analyzestepbystepanddevelopalgorithmstosolverealworldproblemsbyimplementing Stacks,Queues data structures.
4. Understandandimplement varioussearching&sortingtechniques.
5. UnderstandtheNon-LinearDataStructuressuchasBinaryTreesandGraphs

UNIT-I

Basic Concepts: Pointers and dynamic memory allocation, Algorithm-Definition and characteristics,AlgorithmAnalysis-SpaceComplexity,TimeComplexity,Asymptotic Notation**Introduction toDatastructures:**Definition**,**TypesofDatastructure,AbstractDataTypes(ADT),DifferencebetweenAbstract DataTypes,DataTypes,and DataStructures.

Arrays-Concept of Arrays, Single dimensional array, Two dimensional array, Operations on arrayswithAlgorithms (searching, traversing, inserting,deleting)

UNIT-II

LinkedList: ConceptofLinkedLists,RepresentationoflinkedlistsinMemory,Comparisonbetween Linked List and Array, Types of Linked Lists - Singly Linked list, Doubly Linked list,CircularlySingly Linked list, Circularly Doubly Linked list;

Implementation of Linked List ADT: Creating a List, Traversing a linked list, Searching linkedlist,Insertion and deletion into linked list (At first Node, Specified Position, Last node), Application oflinked lists

UNIT-III

Stacks:IntroductiontostackADT,RepresentationofstackswitharrayandLinkedList,Implementation of stacks, Application of stacks - Polish Notations - Converting Infix to Post FixNotation - Evaluation of Post Fix Notation - Tower of Hanoi, Recursion: Concept and Comparisonbetweenrecursion andIteration

IIISemester

Course6:DataStructuresusingC

Credits-3

Queues:IntroductiontoQueueADT,RepresentationofQueueswitharrayandLinkedList,Implementation of Queues, Application of Queues Types of Queues- Circular Queues, De-queues,PriorityQueue

UNIT-IV

Searching:LinearorSequentialSearch,BinarySearch andIndexedSequentialSearch
Sorting:SelectionSort,BubbleSort,InsertionSort,QuickSortandMergeSort

UNIT-V

BinaryTrees: ConceptofNon-LinearDataStructures,IntroductionBinaryTrees,TypesofTrees,BasicDefinitionofBinaryTrees,PropertiesofBinaryTrees,RepresentationofBinaryTrees, Operations on a Binary Search Tree, Binary Tree Traversal, Applications of Binary Tree.**Graphs:**IntroductiontoGraphs,TermsAssociatedwithGraphs,SequentialRepresentationofGraphs, LinkedRepresentationofGraphs,TraversalofGraphs(DFS,BFS),ApplicationofGraphs.

TextBooks:

1. HorowitzandSahani,"FundamentalsofDataStructures",GalgotiaPublicationsPvtLtdDelhi India.
2. A.K.Sharma,DataStructureUsingC,PearsonEducation India.
3. "DataStructuresUsingC"BalagurusamyE.TMH

ReferenceBooks

1. "DataStructuresthroughC",YashavantKanetkar,BPBPublications
2. RajeshK.Shukla,"DataStructureUsingCandC++"WileyDreamtechPublication.
3. Lipschutz,"DataStructures"Schaum'sOutlineSeries,TataMcgraw-hillEducation(India)Pvt.Ltd .
4. Michael T. Goodrich, Roberto Tamassia, David M. Mount "Data Structures andAlgorithms in C++", WileyIndia.

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity: Algorithmanalysisexercises

EvaluationMethod: ProgrammingAssignmentandCorrectness

Unit2:Activity: Presentations onreal-lifeapplicationsoflinkedlists

EvaluationMethod: Presentationskillsorreports

Unit3:Activity: Role-playingactivitiesforstackoperations

EvaluationMethod: Problem-solvingskills,communicationandcollaborationabilities.

Unit4:Activity: Sorting algorithmanalysisandcomparison activities

EvaluationMethod: Performanceanalysisandpresentation.

Unit5:Activity: CaseStudyonApplicationsofGraphs

EvaluationMethod: Criticalthinking,problem-solving,andpresentationskills

IIISemester

Course6:DataStructuresUsingC

Credits-1

ListofExperiments:

1. Writeaprogramtoread‘N’numbersofelementsintoanarrayandalsoperformthefollowingoperation on an array
    a. Addanelementatthebeginningofanarray
    b. Insertanelementatgivenindexofarray
    c. Updateanelementusingavaluesand index
    d. Deleteanexistingelement
2. WriteProgramtoimplementSingleLinkedListwithinsertion,deletionandtraversaloperations
3. WriteProgramtoimplementCirculardoublyLinkedListwithinsertion,deletionandtraversaloperatio ns
4. WriteProgramstoimplementtheStackoperationsusinganarray
5. Writeaprogram usingstacks to convertagiveninfixexpression topostfix
6. WritePrograms toimplementtheStackoperationsusing LikedList.
7. WritePrograms toimplementtheQueueoperations usinganarray.
8. WriteProgramstoimplementtheQueueoperationsusingLikedList.
9. WriteaprogramforBinarySearch TreeTraversals
10. Writeaprogramtosearchanitemin agivenlist usingthefollowingSearchingAlgorithms
    a. LinearSearch
    b. BinarySearch.
11. Writeaprogramforimplementationof thefollowing SortingAlgorithms
    a. Bubble Sort
    b. InsertionSort
    c. QuickSort

IIISemester

Course7:ComputerOrganization

Credits-3

CourseObjectives

Tofamiliarizewithorganizational aspectsofmemory,processorand I/O.

CourseOutcomes

Uponsuccessfulcompletion ofthecourse,thestudents willbeableto

1. Identifydifferent typesofinstructions
2. Differentiatebetweenmicro-programmedandhard-wiredcontrolunits.
3. Analysetheperformance ofhierarchicalorganization ofmemory.
4. Summarizedifferentdata transfertechniques.
5. Demonstratearithmeticoperationsonfixed-andfloating-pointnumbersandillustrateconceptsof parallel processing.

UNIT– I

RegisterTransfer Language andMicro Operations: Introduction- Functional units, computerregisters, register transfer language, register transfer, bus and memory transfers, arithmetic, logic andshiftmicro-operations, arithmeticlogicshift unit.

BasicComputerOrganizationandDesign: Instructioncodes,instructioncycle. Registerreferenceinstructions, Memory–referenceinstructions,input–outputandinterrupt.

UNIT– II

CPU and Micro Programmed Control: Central Processing unit: Introduction, instruction formats,addressing modes.Control memory, address sequencing, design of control unit - hard wired control, microprogrammedcontrol.

UNIT– III

Memory Organization: Memory hierarchy, main memory, auxiliary memory, associative memory,cacheMemoryand mappings.

UNIT– IV

Input-Output Organization: Peripheral Devices, input-output interface, asynchronous datatransfer,modesoftransfer-programmedI/O,priorityinterrupt,directmemoryaccess,Input–OutputProcessor(IOP).

UNIT–V

ComputerArithmeticandParallelProcessing: Datarepresentation-fixedpoint,floatingpoint,additionand subtraction,multiplication and divisionalgorithms.

ParallelProcessing-ParallelProcessing,Pipelining,ArithmeticPipeline,InstructionPipeline.

TextBooks:

1.M.MorisMano,"ComputerSystemsArchitecture",3rdedition,Pearson/PHI.

ReferenceBooks:

1. CarlHamacher,ZvonksVranesic,SafeaZaky,“ComputerOrganization”,5thedition,McGrawHill.
2. WilliamStallings,“ComputerOrganizationand Architecture”,8thedition,Pearson/PHI.

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity: Quizcompetition onmicro-operations.
EvaluationMethod: Accuracyandspeedinansweringquizquestions.

Unit2:Activity: InstructionFormatPuzzle:Solvingapuzzletodecodeandunderstandinstructionformats.
EvaluationMethod: Accuracyandspeedincompletingthepuzzle.

Unit3:Activity: MemoryHierarchyPoster:Creatinginformativepostersorinfographicsonmemoryhierarchy.
EvaluationMethod: Clarityofinformation,presentationandcreativityofvisualdesign.

Unit4:Activity: I/OTroubleshooting Challenge
EvaluationMethod:problemidentification,feasibilityofproposedsolutions,andclarityofexplanations.

Unit5:Activity: CaseStudyonParallel processingarchitecture.
EvaluationMethod: Understandingofparallelprocessingconceptsandarchitectures.

IIISemester

Course3:ComputerOrganization

Credits-1

LabExperiments

1. ImplementaCprogramtoconvertaHexadecimal,octal,andbinarynumber todecimalnumberviceversa.
2. Implement aCprogramtoperformBinaryAddition&Subtraction.
3. Implement aCprogramtoperformMultiplication oftwobinarynumbers.
4. Implement arithmeticmicro-operationsusinglogicgates.
5. Implementlogic andshiftmicro-operationsusinglogicgates.
6. ImplementaCprogramtoperformMultiplicationoftwobinarynumbers(signed)usingBooth’s Algorithms.
7. ImplementaCprogramtoperformdivisionoftwobinarynumbers(Unsigned)usingrestoringdivision algorithm.
8. ImplementaCprogramtoperformdivisionoftwobinarynumbers(Unsigned)usingnon-restoringdivision algorithm.
9. WriteassemblylanguagecodeforA+B*(C-D)usingvariousinstructionformatsinMASMoranyopen-sourceassembler.
10. WriteassemblylanguagecodeforA+B*Cusingvariousaddressingmodesin MASMoranyopen-sourceassembler.

III

SemesterCourse8:Operating Systems

Credits-3

CourseObjectives

To gain knowledge about various functions of an operating system like memory management,processmanagement, devicemanagement, etc.

CourseOutcomes:

Uponsuccessfulcompletion ofthecourse,astudent will beableto:

1. Demonstrateknowledge andcomprehensionofoperatingsystemfunctions.
2. Analyzedifferentprocessschedulingalgorithmsandapplythemtomanageprocessesandthreadseffectively
3. Createstrategiestoprevent,detect,andrecoverfromdeadlocks,anddesignsolutionsforinter-processcommunication and synchronizationproblems.
4. Compareandcontrastdifferentmemoryallocationstrategiesandevaluatetheireffectiveness
5. EvaluatediskschedulingalgorithmswhileimplementingOSsecuritymeasures

UNIT-I

WhatisOperatingSystem?HistoryandEvolutionofOS,BasicOSfunctions,ResourceAbstraction, Types of Operating Systems– Multiprogramming Systems, Batch Systems, TimeSharingSystems;OperatingSystemsforPersonalComputers,WorkstationsandHand-heldDevices,ProcessControl & Real timeSystems.

UNIT-II

Processor and User Modes, Kernels, System Calls and System Programs, System View of theProcessandResources,ProcessAbstraction,ProcessHierarchy,Threads,ThreadingIssues,ThreadLibraries;ProcessScheduling-Non-PreemptiveandPreemptiveScheduling Algorithms.

UNITIII

ProcessManagement: Deadlock,DeadlockCharacterization,NecessaryandSufficientConditionsfor Deadlock,DeadlockHandlingApproaches:DeadlockPrevention,DeadlockAvoidance and DeadlockDetection and Recovery.

Concurrent and Dependent Processes, Critical Section, Semaphores, Methods for Inter processCommunication;ProcessSynchronization,ClassicalProcessSynchronizationProblems:Producer-Consumer,Reader-Writer.

UNITIV

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Memory Management: Physical and Virtual Address Space; Memory Allocation Strategies– Fixedand-VariablePartitions, Paging, Segmentation, VirtualMemory.

UNITV

FileandI/OManagement,OSsecurity: DirectoryStructure,FileOperations,FileAllocationMethods, DeviceManagement,Pipes,Buffer,SharedMemory,DiskSchedulingalgorithms.

TextBooks:

1. Operating SystemPrinciplesbyAbrahamSilberschatz,PeterBaerGalvinand GregGagne(7thEdition) WileyIndiaEdition.

ReferenceBooks

1. OperatingSystems: InternalsandDesignPrinciples byStallings(Pearson)
2. OperatingSystems byJ.ArcherHarris(Author),JyotiSingh(Author)(TMH)

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity: CaseStudyonaspecificOperatingSystem:highlightingitsfunctionsandkeyfeatures.
EvaluationMethod: Casestudypresentation,depthofunderstandingofoperatingsystemfunctions,and ability toarticulatekeyconcepts.

Unit2:Activity: ComparisonPosteron Scheduling Algorithms
EvaluationMethod: Assessmentofpostersbasedoncontentaccuracy,clarityofinformation,visualpresentation,andabilitytoconveykeyinsights.

Unit3:Activity: AssignmentonDeadLockprevention techniques
EvaluationMethod: Understanding,Completionandreport.

Unit4:Activity: Debateon variousMemoryallocationschemes
EvaluationMethod: Debatearguments,abilitytocounteropposingviewpoints,logicalreasoning,and presentation skills.

Unit5:Activity: Comparativestudyofvariousdiskschedulingalgorithmsusingrealworlddatasets
EvaluationMethod: Analysismethodology,accuracyofresults,andpresentationoffindingsand conclusions.

IIISemester

Course8:OperatingSystems

Credits-1

ListofExperiments:

1. IllustratetheLINUXcommands
    a) pwd
    b) mkdir
    c) rmdir
    d) grep
    e) chmod
    f) ls
    g) rm
    h) cp
2. Writeaprogramtocalculateaveragewaitingtimeandturnaroundtimeofeachprocessusingthefollowing CPUScheduling algorithmforthegiven processschedules.
    a) FCFS
    b) SJF
    c) Priority
    d) Round Robin
3. SimulateMVTandMFTmemorymanagementtechniques
4. Writeaprogram forBankersAlgorithm forDeadLockAvoidance
5. ImplementBankersAlgorithmDeadLockPrevention.
6. WriteaprogramtosimulateProducer-Consumerproblem.
7. SimulateallPagereplacementalgorithms.
    e) FIFO
    f) LRU
    g) LFU
    h) Optimal
8. SimulatePaging Techniquesofmemorymanagement
9. Simulatethefollowingdiskschedulingalgorithms
    a) FCFS
    b) SSTF
    c) SCAN
    d) CSCAN

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IVSemester

Course9:DatabaseManagementSystems

Credits-3

LearningObjectives:

Tofamiliarizewithconceptsofdatabasedesign

LearningOutcomes: Onsuccessfulcompletionofthecourse,studentswill beableto

1. Differentiatebetweendatabasesystems andfilebasedsystems
2. DesignadatabaseusingERmodel
3. Userelationalmodelindatabasedesign
4. UseSQLcommands forcreatingandmanipulatingdatastoredindatabases.
5. WritePL/SQLprogramstoworkwithdatabases.

UNIT-I

Overview of Database Management System: Introduction to data, information, database, databasemanagementsystems,file-basedsystem,Drawbacksoffile-BasedSystem,databaseapproach,Classification of Database Management Systems, advantages of database approach, Various DataModels, Components of Database Management System, three schema architecture of data base, costsandrisks of databaseapproach.

UNIT-II

Entity-Relationship Model: Introduction, the building blocks of an entity relationship diagram,classification of entity sets, attribute classification, relationship degree, relationship classification,reducing ER diagram to tables, enhanced entity-relationship model (EER model), generalization andspecialization,**ISA**relationshipandattributeinheritance,multipleinheritance,constraintsonspecialization and generalization, advantages of ERmodeling.

UNIT -III

Relational Model: Introduction, CODD Rules, relational data model, concept of key, relationalintegrity,relationalalgebra,relationalalgebraoperations,advantagesofrelationalalgebra,

limitationsofrelationalalgebra,relationalcalculus,tuplerelationalcalculus,domainrelationalCalculus(DRC), Functionaldependencies and normalforms upto 3rd normal form.

UNIT-IV

StructuredQueryLanguage: Introduction,CommandsinSQL,DataTypesinSQL,DataDefinitionLanguage,SelectionOperation,ProjectionOperation,Aggregatefunctions,DataManipulation Language, Table Modification Commands, Join Operation, Set Operations, View, SubQuery.

UNIT-V

PL/SQL: Introduction,ShortcomingsofSQL,StructureofPL/SQL,PL/SQLLanguageElements,DataTypes,OperatorsPrecedence,ControlStructure,StepstoCreateaPL/SQL,Program,IterativeControl,Procedure, Function, DatabaseTriggers,Types of Triggers.

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TextBooks:

1. OperatingSystem PrinciplesbyAbrahamSilberschatz,PeterBaerGalvinandGregGagne(7thEdition)Wiley India Edition.

ReferenceBooks

1. DatabaseManagementSystemsbyRaghuRamakrishnan,McGrawhill
2. PrinciplesofDatabaseSystemsbyJ.D.Ullman
3. FundamentalsofDatabaseSystems byR.ElmasriandS.Navathe
4. SQL:TheUltimateBeginnersGuidebySteveTale.

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity: SeminarPresentationonDatabaseManagementSystems

EvaluationMethod: Depthofresearch,clarityofexplanations,abilitytoaddressquestionsandengagetheaudience.

Unit2:Activity: CaseStudy onEERmodel

Evaluation Method: **I**dentification of inheritance relationships, effective use ofgeneralizationandspecialization,andadherenceto constraints.

Unit3:Activity: ExerciseonNormalization:Assignstudentsasetofunnormalizedtablesandhavethemnormalizethe tables to third normal form

EvaluationMethod: Normalizedtabledesigns,identificationoffunctionaldependencies,adherencetonormalization rules, andeliminationof anomalies.

Unit4:Activity: CompetitiononSQLQueryWriting

EvaluationMethod: Querycorrectness,efficiency,properuseofSQLcommands,abilitytohandlecomplexscenarios,andcreativity in queryformulation.

Unit5:Activity: Peer Review ofPL/SQLcode

EvaluationMethod: Peerevaluationofcodequality,adherencetocodingstandards,properuseof languageelements, and logic.

IVSemester

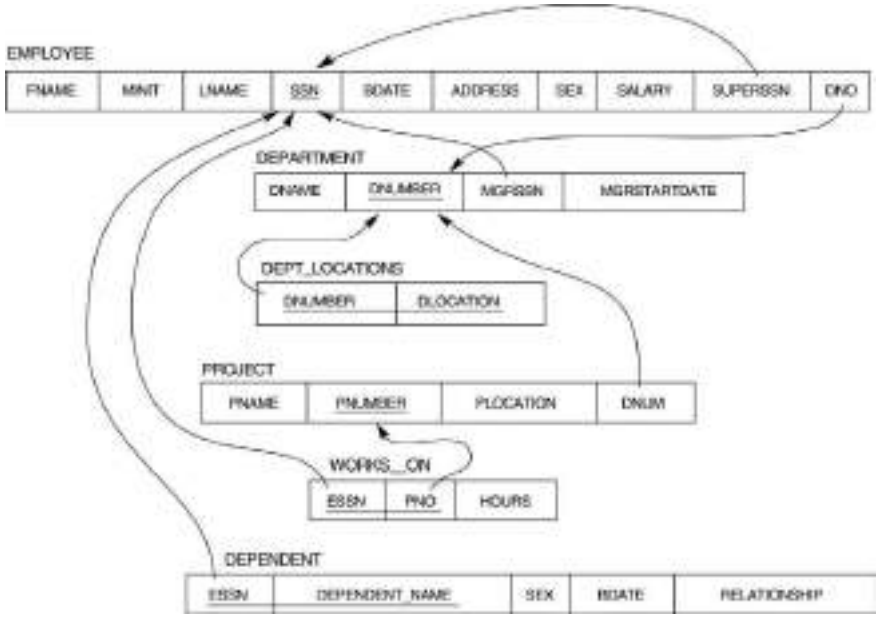
Course9:DatabaseManagementSystems

Credits-1

ListofExperiments:

1. DrawERdiagramforhospitaladministration
2. Creationofcollegedatabaseandestablishrelationships betweentables
3. Relationaldatabaseschema ofacompanyisgiven inthefollowingfigure.

RelationalDatabaseSchema-COMPANY



Questionstobeperformedonaboveschema

1. CreateabovetableswithrelevantPrimaryKey,ForeignKeyandotherconstraints
2. Populatethetableswithdata
3. Displayall thedetails ofall employeesworkinginthecompany.
4. Displayssn,lname,fname,addressofemployeeswhoworkindepartment no7.
5. RetrievetheBirthdateand Addressoftheemployeewhosenameis'FranklinT. Wong'
6. Retrievethename andsalaryofeveryemployee
7. Retrieveall distinctsalaryvalues
8. Retrieveall employeenameswhoseaddressisin‘Bellaire’
9. Retrieveall employeeswhowerebornduringthe 1950s
10. Retrieve all employees in department 5 whose salary is between 50,000and60,000(inclusive)

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11. Retrievethenamesofallemployeeswhodonothavesupervisors
12. RetrieveSSNanddepartmentnameforallemployees
13. Retrievethenameandaddressofallemployeeswhoworkforthe'Research'department
14. For every project located in 'Stafford', list the project number, the controlling departmentnumber,and thedepartmentmanager's lastname,address,and birth date.
15. For each employee, retrieve the employee's name, and the name of his or her immediatesupervisor.
16. Retrieveall combinationsofEmployeeNameandDepartmentName
17. Make a list of all project numbers for projects that involve an employee whose last nameis'Narayan'eitherasa workerorasamanagerofthedepartmentthatcontrolstheproject.
18. Increase the salary of all employees working on the 'Product X' project by 15%. Retrieveemployeenameand increased salary oftheseemployees.
19. Retrieve a list of employees and the project name each works in, ordered by the employee'sdepartment,andwithineachdepartmentorderedalphabeticallybyemployeefirst name.
20. Select the names of employees whose salary does not match with salary of any employeeindepartment10.
21. Retrieve the employee numbers of all employees who work on project located in Bellaire,Houston,or Stafford.
22. Findthesum ofthesalaries ofallemployees, themaximumsalary, theminimum salary,andtheaveragesalary.Display withproper headings.
23. Find the sum of the salaries and number of employees of all employees of the 'Marketing'department, as well as the maximum salary, the minimum salary, and the average salary inthisdepartment.
24. Select the names of employees whose salary isgreater than the average salary of allemployeesin department10.
25. Deleteall dependentsofemployeewhosessnis'123456789'.
26. Performaqueryusingalter commandtodrop/addfieldand aconstraintinEmployeetable.

IVSemester

Course10:ObjectOrientedSoftwareEngineering

Credits-3

CourseObjective:

TointroduceObject-orientedsoftwareengineering(OOSE)-whichisapopulartechnicalapproachto analyzing, designing an application, system, or business by applying the object- oriented paradigmandvisual modeling.

CourseOutcomes:

Uponsuccessfulcompletion ofthecourse,astudentwill beableto:

1. Understand and apply the fundamental principles of Object-Oriented Programming (OOP)concepts and Unified Modeling Language (UML) basics, in the development of softwaresolutions.
2. Analyze and specify software requirements, develop use cases and scenarios, apply object-orientedanalysis and design (OOAD)principles
3. Familiarwith theconceptoftest-drivendevelopment(TDD)and its practicalimplementation
4. AnalyzeandEvaluateSoftwareMaintenanceandEvolutionStrategies
5. ApplyAdvanced Object-OrientedSoftwareEngineeringConcepts

UNIT-I

Introduction to Object-Oriented Programming: Overview of software engineering, Introduction toObject-Oriented Programming (OOP) concepts (classes, objects, inheritance, polymorphism), UnifiedModellingLanguage(UML) basics,Introductiontosoftwaredevelopmentprocessandsoftwaredevelopmentlifecycle(SDLC).

UNIT-II

RequirementsAnalysisandDesign:Requirementsanalysisandspecification,Usecasesandscenarios, Object-oriented analysis and design (OOAD), Design patterns, UML modelling techniques(classdiagrams, sequencediagrams,statemachinediagrams, activity diagrams)

UNIT-III

Software Construction and Testing: Software construction basics, Object-oriented design principles,Object-oriented programming languages (Java, C++, Python), Software testing basics (unit testing,integrationtesting, systemtesting), Test-drivendevelopment (TDD)

UNIT-IV

Software Maintenance and Evolution: Software maintenance basics, refactoring techniques Softwareversioncontrol, Codereviewand inspection, Softwareevolutionand reengineering

UNIT-V

AdvancedTopicsinObject-OrientedSoftwareEngineering:Model-drivenengineering(MDE),Aspect-orientedprogramming(AOP),Component-basedsoftwareengineering(CBSE),Service-orientedarchitecture(SOA), Agile softwaredevelopment and Scrum methodologies.

TextBook(s)

1. AnIntroductiontoObject-OrientedAnalysisandDesignandtheUnifiedProcess,3rdEdition,Craig Larman, Prentice-Hall.
2. ProgramminginJavabySachinMalhotra,Oxford UniversityPress

ReferenceBooks

1. Requirementsengineering:processesandtechniques,G.Kotonyaand,I.Sommerville,1998,Wiley
2. DesignPatterns,E.Gamma,R.Helm,R.Johnson,andJ.Vlissides
3. TheUnifiedModelingLanguageReferenceManual,J.Rumbaugh,I.JacobsonandG.Booch,Addison Wesley

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity: Group Activity: DesignandimplementasmallOOPproject
EvaluationMethod: Presentationevaluationrubric,ProjectevaluationbasedonOOPprinciples.

Unit2:Activity: UseCaseScenarioPresentation&PeerActivity:Reviewandprovidefeedbackoneach other's usecasediagrams
EvaluationMethod: Presentation evaluationrubric,Peerfeedbackassessment.

Unit3:Activity: PosterPresentation:IllustrateTDDprinciplesandbenefits
EvaluationMethod: Posterpresentationevaluation

Unit4:Activity: PeerActivity:Analyzeanddiscussdifferentmaintenancestrategies
EvaluationMethod: Peerdiscussionparticipationevaluation

Unit5:Activity: SeminaronDesignPatterns
EvaluationMethod: Depthofresearch,clarityofexplanations,abilitytoaddressquestionsandengagetheaudience.

IVSemester

Course10:ObjectOrientedSoftwareEngineering

Credits-1

SuggestedSoftwareTools: StarUML/UMLGraph/Topcased/Umberollo/ArgoUML/EclipseIDE,Visual Paradigm forUML/Rational SoftwareArchitect/Any otherOpen SourceTool

ListofExperiments:

Selectdomainofinterest(e.g.CollegeManagementSystem)andidentifymulti-tiersoftwareapplication to work on (e.g. Online Fee Collection). Analyze, design and develop this applicationusingOOSE approach:

1. DevelopanIEEEstandardSRSdocument.Alsodeveloprisk managementandprojectplan(Gantt chart).
2. UnderstandingofSystemmodeling:Datamodeli.e.ER–Diagramanddrawthe ERDiagramwithgeneralization,specializationandaggregationofspecifiedproblem statement
3. UnderstandingofSystemmodeling:Functionalmodeling:DFDlevel0i.e.ContextDiagramanddraw it
4. UnderstandingofSystemmodeling:Functionalmodeling:DFDlevel1andDFDlevel2anddrawit.
5. Identifyusecases anddevelop theusecasemodel.
6. Identifythebusiness activitiesanddevelopanUMLActivitydiagram.
7. Identitytheconceptualclassesanddevelopadomain modelwithUMLClassdiagram.
8. Usingtheidentifiedscenariosfindtheinteractionbetweenobjectsandrepresentthemusing UML Interaction diagrams.
9. Drawthestatechartdiagram.
10. Identifytheuserinterface,domainobjects,andtechnicalservices.Drawthepartiallayered,logicalarchitecturediagram with UMLpackagediagram notation.
11. Implementthetechnicalserviceslayer.
12. Implementthedomainobjectslayer.
13. Implementtheuserinterfacelayer.
14. Drawcomponentanddeploymentdiagrams.

IVSemester

Course11:DataCommunicationandComputerNetworks

Credits-3

CourseObjectives

To provide students with a comprehensive understanding of networking principles, protocols, andtechnologies,enablingthemtodesign,analyze,andevaluateefficientandreliablenetworksolutions.

CourseOutcomes

Uponsuccessfulcompletion ofthecourse,astudentwill beableto:

1. Understandandapplynetworkapplications,hardware,software,andreferencemodelsfornetworkcommunication.
2. Designandanalyzedatalinklayerprotocols,multipleaccessprotocols,andwirelessLANtechnologies.
3. Designroutingalgorithms,congestioncontrolalgorithms,andevaluatenetworklayerprotocolsforinternetworking.
4. Analyzetransportservice,transportprotocols, andevaluateUDPandTCPintheinternet.
5. Understandandevaluateapplicationlayerprotocols,including DNS,email,WWW,andnetworkmanagementprotocols.

UNIT-I

INTRODUCTION: Network applications, network hardware, network software, reference models:OSI,TCP/IP,Internet, Connection oriented network-X.25,framerelay.

THEPHYSICALLAYER: Theoreticalbasisforcommunication,guidedtransmissionmedia,wirelesstransmission, the publicswitched telephonenetworks,mobiletelephonesystem.

UNIT-II

THE DATA LINK LAYER: Design issues, error detection and correction, elementary data linkprotocols, sliding window protocols, example data link protocols - HDLC, the data link layer on theinternet.

THEMEDIUMACCESSSUBLAYER: Channelallocationsproblem,multipleaccessprotocols,Ethernet,Data Link Layerswitching,WirelessLAN,BroadbandWireless,Bluetooth.

UNIT-III

THE NETWORK LAYER: Network layer design issues, routing algorithms, Congestion controlalgorithms,Internetworking,thenetworklayerintheinternet(IPv4andIPv6),QualityofService.

UNIT-IV

THETRANSPORTLAYER:Transportservice,elementsoftransportprotocol,SimpleTransportProtocol ,Internet transport layer protocols: UDP and TCP.

UNIT-V

THEAPPLICATIONLAYER:Domainnamesystem,electronicmail,WorldWideWeb:architecturalover view, dynamicweb document and http.

APPLICATIONLAYERPROTOCOLS:SimpleNetworkManagementProtocol,FileTransferProtocol, Simple Mail Transfer Protocol, Telnet.

TextBook(s)

1. S.Tanenbaum(2003),ComputerNetworks,4thedition,PearsonEducation/PHI,NewDelhi,Ind ia

ReferenceBooks

2. BehrouzA.Forouzan(2006),DatacommunicationandNetworking,4thEdition,McGraw-Hill,India.
3. Kurose, Ross (2010), Computer Networking: A top down approach, PearsonEducation,India.

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity: Hands-onexercisestoconfigure networkapplications

EvaluationMethod: Practicalskillsinconfiguringnetworkapplications,hardware,andsoftware.

Unit2:Activity: ProtocolDesignandSimulationusingsimulationtoolslikeNS-3orCiscoPacketTracer.

EvaluationMethod: Students'abilitytodesignandsimulatedatalinklayerprotocolsandmultipleac cess protocols

Unit3:Activity: GuestLecturesandWorkshopsonroutingalgorithms,congestioncontrol,andnetworklayer protocols.

EvaluationMethod: Students'participationandunderstandingdemonstratedinguestlecturesand workshop

Unit4:Activity: NetworkMonitoringandTrafficAnalysisusingtoolslikeWireshark

EvaluationMethod: Understandingoftransportprotocolsthroughtheiranalysisofnetworktraffica nd identificationofUDP andTCPbehavior

Unit5:Activity: Group Projects onNetworkApplicationDevelopment

EvaluationMethod: GroupProjectPresentations

IV **Semester**

Course11:DataCommunicationandComputerNetworks

Credits-1

ListofExperiments:

1. Understanding variousnetworktoolsinWindows andLinux
2. Studydifferent typesofNetworkdevices andCables
3. BuildingaLocalAreaNetwork
4. ConceptofNetworkIPAddress
5. IntroductiontoNetworkSimulator–PacketTracer(PT)
6. Configuration ofaRouterusingPacket Tracer
7. ImplementationofaNetworkusingPacketTracer
8. ImplementationofStaticRoutingusingPacketTracer
9. ImplementationofRIPusing PacketTracer
10. ImplementationofOSPF usingPacketTracer
11. ImplementDNSusingpackettracer
12. ImplementationofaVLANusingPacket Tracer

V **Semester**

Course12:WebInterfaceDesigningTechnologies

Credits-3

LearningObjectives:

To enable students to understand webarchitecture, developaestheticwebsites, create staticanddynamic web pages, implement user interactivity, and gain proficiency in installing and utilizingWordPressand plugins

LearningOutcomes: Onsuccessfulcompletionofthecourse,studentswill beableto

1. Understandandappreciatethewebarchitectureandservicesalongwithitsbasicbuildingblocks
2. Gainknowledgeabout variouscomponentsof awebsiterelatedtoaesthetics
3. Demonstrateskillsregardingcreationofastaticwebsite andadditionofdynamicbehaviortoawebsite
4. Getexperienceonmakinguser-interactivewebpages.
5. Learnhowtoinstallwordpressandgaintheknowledgeofinstallingvariouspluginstouseintheirwebsites.

UNIT-I

HTML: Introductiontowebdesigning,differencebetweenwebapplicationsanddesktopapplications, introduction to HTML, HTML structure, elements, attributes, headings, paragraphs,images,tables, lists,blocks, symbols,embedding multi-mediacomponents inHTML, HTML forms

UNIT– II

CSS:CSShome,introduction,syntax,CSScombinators,colors,background,borders,margins,padding,height/width,text,fonts,tables,lists,position,overflow,float,pseudoclass,pseudoelements,opacity, tool tips, imagegallery,CSS forms, CSScounters.

UNIT– III

JavaScript: WhatisDHTML,JavaScript,basics,variables,operators,statements,stringmanipulations,mathematicalfunctions,arrays,functions.objects,regularexpressions,exceptionhandling.

UNIT-IV

Client-Side Scripting: Accessing HTML form elements using Java Script object model, basic datavalidations, data format validations, generating responsive messages, opening windows using javascript,differentkindsofdialogboxes,accessingstatusbarusingjavascript,embeddingbasicanimativefeatures usingdifferent keyboardand mouseevents.

UNIT– V

Word press: Introduction to word press, features, and advantages, installing and configuring wordpress and understanding its admin panel (demonstration only), working with posts, managing pages,working with media - Adding, editing, deleting media elements, working with widgets, using menus,working with themes, defining users, roles and profiles, adding external links, extending word presswithplug-ins.

TextBook(s)

1. ChrisBates,WebProgrammingBuildingInternetApplications,SecondEdition,Wiley(2007)
2. Paul S.WangSanda S. Katila, an Introduction to Web Design plus Programming, Thomson(2007).

ReferenceBooks

1. HeadFirstHTMLandCSS,ElisabethRobson,EricFreeman,O'ReillyMediaInc.
2. AnIntroductiontoHTMLandJavaScript:forScientistsandEngineers,DavidR.Brooks.Springer,2007
3. Schaum'sEasyOutlineHTML,DavidMercer,McgrawHillProfessional.
4. WordpressforBeginners, Dr.AndyWilliams.
5. Professionalwordpress,BradWilliams,Daviddamstra,Hanstern.

SUGGESTEDCO-CURRICULARACTIVITIES &EVALUATIONMETHODS:

Unit 1: Activity: Infographic explaining the necessity to have a web site for each of the agenciessuchashotels, hospitals, supermarkets, andeducationalinstitutions.

Evaluation Method: Assess the accuracy, visual design, clarity, creativity, use of visualelements, presentation of the infographic explaining the necessity of awebsitefordifferentagencies.

Unit 2: Activity: Seminar though PPT on various Look and Feel components that websites relatedtodifferentagencies

EvaluationMethod: Contentknowledge,organization,clarity,presentationskills,visualaids,audience engagement

Unit3:Activity: Codesnippets Challenge.

EvaluationMethod: Accuracy,functionality,efficiency,codereadability,andproblem-solvingapproach of theJavaScript codesnippets

Unit 4: Activity: Group discussion on different kinds of web forms that take and validate userinputusing javascript validations

EvaluationMethod: Activeparticipation,knowledgesharing,criticalthinking,anddemonstration ofdifferentwebformsandJavaScriptvalidations

Unit5:Activity: CreationofPersonalwebsiteusing wordpress

Evaluation Method: Design aesthetics, functionality, user interactivity, contentorganization,andutilization of plugins.

VSemester

Course12:WebInterfaceDesigningTechnologies

Credits-1

ListofExperiments:

1. CreateanHTMLdocument withthefollowingformattingoptions:

   (a) Bold, (b) Italics, (c) Underline, (d) Headings (Using H1 to H6 heading styles), (e) Font(Type, Size and Color), (f) Background (Colored background/Image in background), (g)Paragraph,(h) Line Break, (i)HorizontalRule, (j)Pretag

2. CreateanHTMLdocument whichconsists of:

   (a) OrderedList(b)UnorderedList(c)NestedList(d)Image

3. CreateaTablewithfour rows andfivecolumns.Placeanimageinonecolumn.

4. Using“table”tag, aligntheimagesasfollows:

5. Createamenu formusing html.

6. Stylethemenu buttonsusing CSS.

7. Createaformusing HTML whichhasthe followingtypesofcontrols:

   (a) TextBox(b)Option/radiobuttons(c)Checkboxes(d)ResetandSubmitbuttons

8. Embedacalendarobjectinyourwebpage.

9. Createaformthatacceptstheinformationfromthesubscriberofamailingsystem.

Wordpress:

10. Installationandconfiguration ofwordpress

11. Access adminpaneland manageposts

12. Access adminpaneland managepages

13. Addwidgets andmenus

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14. Createusersandassignroles
15. Createasiteandaddathemetoit

VSemester

Course13:WebApplicationsDevelopmentusingPHP&MYSQL

Credits-3

LearningObjectives:

To enable students to understand open-source tools to create dynamic web pages, implement userinteractivity,and gain proficiency indevelopingweb sites

LearningOutcomes: Onsuccessfulcompletionofthecourse,studentswill beableto

1. Writesimple programsin PHP.
2. Understandhowtouseregularexpressions,handleexceptions,andvalidatedatausingPHP.
3. ApplyIn-Built functionsandCreateUserdefinedfunctionsinPHPprogramming.
4. WritePHPscripts to handleHTMLforms.
5. KnowhowtousePHP withaMySQLdatabaseandcanwritedatabasedrivenwebpages.

UNIT-I

The building blocks of PHP: Variables, Data Types, Operators and Expressions, Constants. **FlowControl Functions in PHP**: Switching Flow, Loops, Code Blocks and Browser Output.**Workingwith Functions:** Creating functions, Calling functions, Returning the values from User- DefinedFunctions, Variable Scope, Saving state between Function calls with the static statement,arguments offunctions

UNIT-II

WorkingwithArrays: CreatingArrays,SomeArray-RelatedFunctions.

WorkingwithObjects: CreatingObjects,AccessingObjectInstances,**WorkingwithStrings**,**DatesandTime:**FormattingstringswithPHP,ManipulatingStringswithPHP,UsingDateandTimeFunctions in PHP.

UNIT-III

WorkingwithForms: CreatingForms,AccessingFormInputwithUserdefinedArrays,CombiningHTMLandPHPcodeonasingle Page,UsingHiddenFieldstosavestate,Redirectingtheuser,SendingMailonFormSubmission,and**WorkingwithFileUploads**,Managingfilesonserver,**Exceptionhandling.**

UNIT-IV

WorkingwithCookiesandUserSessions: IntroducingCookies,settingaCookiewithPHP,Session Function Overview, starting a Session, working with session variables, passing session IDs inthe Query String, Destroying Sessions and Unsetting Variables, Using Sessions in an EnvironmentwithRegistered Users.

UNIT-V

Interacting with MySQL using PHP: MySQL Versus MySQLi Functions, connecting to MySQLwith PHP, Working with MySQL Data. Planning and Creating Database Tables, Creating Menu,CreatingRecordAdditionMechanism,Viewing Records,CreatingtheRecordDeletionMechanism.

TextBook(s)

1. JulieC.Meloni,SAMSTeachyourselfPHPMySQLandApache,PearsonEducation(2007).
2. StevenHolzner,PHP:TheCompleteReference,McGraw-Hill

ReferenceBooks

1. RobinNixon,LearningPHP,MySQL,JavaScript,CSS&HTML5,ThirdEditionO'reilly,2014
2. XueBaiMichaelEkedahl,ThewebwarriorguidetoWebProgramming,Thomson(2006).

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity: Infographicexplanationofclient-serverarchitectureanddifferentserver-sidescripting languages.

Evaluation Method: Assess the accuracy, visual design, clarity, creativity, use of visualelements,presentationoftheinfographicexplainingthebenefitsofserver-sidescripting languages.

Unit2:Activity: Presentation onvariousopen-sourceframeworksavailableinLAMPmodel

EvaluationMethod: Contentknowledge,organization,clarity,presentationskills,visualaids, audienceengagement

Unit3:Activity: Codesnippets Challenge.

EvaluationMethod: Accuracy,functionality,efficiency,codereadability,andproblem-solvingapproach of thePHP codesnippets

Unit4:Activity: Group discussiononSessionManagementinPHP

EvaluationMethod: Activeparticipation,knowledgesharing,criticalthinking,anddemonstration ofSessionManagement

Unit5:Activity: Hands-onLabSessiononMYSQLQueries

EvaluationMethod: LabPerformanceandCorrectnessofsolutionImplementation

VSemester

Course13:WebApplicationsDevelopmentusingPHP&MYSQL

Credits-1

ListofExperiments:

1. WriteaPHPprogramtoDisplay“Hello”
2. WriteaPHPProgram to displaythetoday’sdate.
3. WriteaPHPprogramtodisplayFibonacciseries.
4. WriteaPHPProgramtoreadtheemployeedetails.
5. WriteaPHPprogram topreparethe studentmarkslist.
6. Createstudentregistrationformusingtextbox,checkbox,radiobutton,select,submitbutton.Anddisplayuser insertedvaluein newPHP page.
7. CreateWebsiteRegistrationFormusingtextbox,checkbox,radiobutton,select,submitbutton.Anddisplay user insertedvalue in new PHPpage.
8. WritePHPscripttodemonstratepassing variables withcookies.
9. WriteaPHPscript toconnectMySQLserverfromyourwebsite.
10. Writeaprogramtokeeptrackofhow manytimesavisitorhasloadedthepage.
11. Write a PHP application to perform CRUD (Create, Read, Update and Delete) operations on adatabasetable.
12. Create a web site using any open-source framework built on PHP and MySQL – It is a teamactivity wherein students are divided into multiple groups and each group comes up with theirownwebsitewith basicfeatures.

VSemesterCourse1

4A:InternetofThings

Credits-3

LearningObjectives:

To enable students to understand basic IoT constructs, create IoT solutions to real world problemsusingIoT

LearningOutcomes: Onsuccessfulcompletionofthecourse,studentswill beableto

1. Understandvariousconcepts,terminologiesandapplicationsofIoT
2. LearnhowtobuildIoTdeviceswithdevelopmentboards
3. UnderstandvariousWirelessprotocolsforIoT
4. Learnhowtousevarioussensorsandactuators&developIoTsolutions using Arduino
5. DevelopandConnectIoTwithCloudPlatforms.

UNIT-I

FundamentalsofIoT: Introduction,Definitions&CharacteristicsofIoT,IoTArchitectures,Physical & Logical Design of IoT, Enabling Technologies in IoT, History of IoT, About Things inIoT,TheIdentifiers inIoT,Aboutthe InternetinIoT,IoTframeworks,IoTandM2M.

ApplicationsofIoT: HomeAutomation,SmartCities,Energy,RetailManagement,Logistics,Agriculture, HealthandLifestyle,IndustrialIoT,Legalchallenges,IoTdesignEthics,IoTinEnvironmentalProtection.

UNIT-II

Sensors Networks : Definition, Types of Sensors, Types of Actuators, Examples and Working, IoTDevelopment Boards: Arduino IDE and Board Types, RaspberriPi Development Kit, RFID Principlesand components, Wireless Sensor Networks: History and Context, The node, Connecting nodes,NetworkingNodes,WSN andIoT.

Unit-III

Wireless Technologies for IoT:WPAN Technologiesfor IoT:IEEE 802.15.4,Zigbee, HART,NFC,Z-Wave, BLE, Bacnetand Modbus.

IP Based Protocols for IoT: IPv6, 6LowPAN, LoRA, RPL, REST, AMPQ, CoAP, MQTT. Edgeconnectivityand protocols.

Unit-IV

Arduino Simulation Environment: Arduino Uno Architecture, Setting up the IDE, Writing ArduinoSoftware,ArduinoLibraries,BasicsofEmbeddedCprogrammingforArduino,InterfacingLED,pushbutton and buzzerwithArduino,Interfacing Arduino withLCD.

Sensor & Actuators with Arduino: Overview of Sensors working, Analog and Digital Sensors,Interfacing of Temperature, Humidity, Motion, Light and Gas Sensors with Arduino, Interfacing ofActuatorswith Arduino,Interfacing of Relay Switch and ServoMotorwith Arduino.

Unit-V

Developing IOT's: Implementation of IoT with Arduino, Connecting and using various IoT CloudBasedPlatformssuchasBlynk,Thingspeak,AWSIoT,GoogleCloudIoTCoreetc.CloudComputing, Fog Computing, Privacy and SecurityIssues inIoT.

TextBook(s)

1. InternetofThings-AHands-onApproach,ArshdeepBahgaandVijayMadisetti,UniversitiesPress, 2015, ISBN: 9788173719547
2. SudipMishra,AnandarupMukherjee,ArijitRoy:IntroductiontoIOT,CambridgeUniversityPress.
3. InternetofThings-DrSuryaDurbha&DrJyotiJoglekar,OxfordUniversityPress

ReferenceBooks

1. DanielMinoli,—"BuildingtheInternetofThingswithIPv6andMIPv6:TheEvolvingWorldofM2M Communications",ISBN:978-1-118-47347-4, WillyPublications
2. PethuruRajandAnupamaC.Raman,"TheInternetofThings:EnablingTechnologies,Platforms,and UseCases", CRC Press

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity: Seminaronvariousapplicationsof IoTthroughPPT

EvaluationMethod: Contentknowledge,organization,clarity,presentationskills,visualaids,audience engagement

Unit2:Activity: Hands-onLabactivityonArduinoDevelopment

EvaluationMethod: LabPerformanceandCorrectnessofCircuit Implementation

Unit3:Activity: Group discussiononFutureWirelessTechnologies.

EvaluationMethod: Activeparticipation,knowledgesharing,criticalthinking,anddemonstrationo fdifferentwireless technologiesfor IoT

Unit4:Activity: Peeractivityon differenttypesofSensors

EvaluationMethod: PeerevaluationofworkingprincipleofSensor,use-casesofsensors.

Unit5:Activity: GuestLectureorExperttalkonCloud basedIoTplatforms

EvaluationMethod: ActiveParticipation,PostTalkreportpresentation

VSemester

Course14 A:InternetofThings

Credits-1

ListofExperiments:

1. UnderstandingArduinoUNOBoardandComponents
2. InstallingandworkwithArduino IDE
3. BlinkingLEDsketchwithArduino
4. Simulation of4-WayTrafficLightwithArduino
5. UsingPulseWidth Modulation
6. LEDFadeSketchandButtonSketch
7. Analog InputSketch(BarGraphwithLEDsandPotentiometre)
8. DigitalReadSerial Sketch(WorkingwithDHT/IR/GasorAnyotherSensor)
9. WorkingwithAdafruit LibrariesinArduino
10. SpinningaDCMotorandMotorSpeedControl Sketch
11. Workingwith Shields
12. DesignAPP using BlinkApp orThingspeak APIand connectit LEDbulb.
13. DesignAPP UsingBlynkAppandConnecttoTemperature,magneticSensors.

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VSemester

Course14B:FoundationsofDataScience

Credits-3

LearningObjectives:

Toenablestudentstodevelop IoTsolutionsforreal-worldproblems

LearningOutcomes: Onsuccessfulcompletionofthecourse,studentswill beableto

1. Identifytheneedfordatascience andunderstandvariousdatacollectionstrategies
2. UnderstandaboutNoSQLandDescriptiveStatistics
3. ApplyNumpymethodstoprocess thedatainanarray.
4. SummarizeandComputeDescriptiveStatisticsusingPandas.
5. Applypowerfuldatamanipulations visualizationusingPandas

UNIT-I

Introduction to Data Science: Need for Data Science – What is Data Science - Evolution of DataScience, Data Science Process – Business Intelligence and Data Science – Prerequisites for a DataScientist – Tools and Skills required. Applications of Data Science in various fields – Data SecurityIssues.

Data Collection Strategies, Data Pre-Processing Overview, Data Cleaning, Data Integration andTransformation,Data Reduction,DataDiscretization,DataMunging, Filtering

UNIT-II

DescriptiveStatistics–Mean,StandardDeviation,SkewnessandKurtosis;BoxPlots–PivotTable –HeatMap–CorrelationStatistics –ANOVA.

No-SQL:DocumentDatabases,Wide-columnDatabasesandGraphicalDatabases.

UNIT-III

Python for Data Science –Python Libraries, Python integrated Development Environments (IDE)forDataScience,**NumPyBasics:**ArraysandVectorizedComputation-TheNumPyndarray-

Creating ndarrays- Data Types for ndarrays- Arithmetic with NumPy Arrays- Basic Indexing andSlicing-Boolean Indexing-Transposing Arraysand Swapping Axes.

Universal Functions: Fast Element-Wise Array Functions- Mathematical and Statistical Methods-Sorting-Uniqueand Other Set Logic.

UNIT-IV

IntroductiontopandasDataStructures: Series,DataFrameandEssentialFunctionality:Dropping Entries- Indexing, Selection, and Filtering- Function Application and Mapping- SortingandRanking. Summarizing and Computing Descriptive Statistics- Unique Values, Value Counts, and Membership.Readingand Writing Datain TextFormat.

UNIT-V

DataCleaningandPreparation: HandlingMissingData-DataTransformation:RemovingDuplicates,TransformingDataUsingaFunctionorMapping,ReplacingValues,DetectingandFilteringOutliers-

Plottingwithpandas: LinePlots,BarPlots,HistogramsandDensityPlots,ScatterorPointPlots.

TextBook(s)

1. Y.DanielLiang,"Introduction toProgramming usingPython",Pearson,2012.
2. WesMcKinney,"PythonforDataAnalysis:DataWranglingwithPandas,NumPy,andIPython",O'Reilly, 2ndEdition, 2018.

ReferenceBooks

1. SanjeevWagh,ManishaBhende,AnuradhaThakare,'FundamentalsofDataScience,CRCPress,1st Edition, 2022
2. JakeVanderPlas,"PythonDataScienceHandbook:EssentialToolsforWorkingwithData",O'Reilly ,2017.

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity: Seminaron Role ofDataScienceinPolitics

EvaluationMethod: Contentknowledge,organization,clarity,presentationskills,visualaids, audienceengagement

Unit2:Activity: Exerciseson DescriptiveStatistics

EvaluationMethod: ProblemSolving,Accuracy

Unit3:Activity: Hands-on Labusing Numpy

EvaluationMethod: LabPerformanceandCorrectnessofsolutionImplementation

Unit4:Activity: Hands-onLabActivityonPandas

EvaluationMethod: LabPerformanceandCorrectnessofsolutionImplementation.

Unit5:Activity: Group Activity tovisualizecollegeperformancerecords usingvariousplots

EvaluationMethod: ActiveParticipation,PostTalkreportpresentation

VSemester
Course14B:FoundationsofDataScience
Credits-1

ListofExperiments:

1. StudyonvariouspythonIDEsforDataScience
2. CreateNumPyarraysfromPythonDataStructures,IntrinsicNumPyobjectsandRandomFunctions.
3. ManipulationofNumPyarrays- Indexing,Slicing, Reshaping,JoiningandSplitting.
4. ComputationonNumPyarraysusingUniversalFunctionsandMathematicalmethods.
5. CreatePandasSeriesand DataFramefromvariousinputs.
6. Import anyCSVfiletoPandasDataFrameandperformthefollowing:
    a. Visualizethefirstandlast10records
    b. Gettheshape,indexandcolumndetails
    c. Select/Deletetherecords (rows)/columnsbasedon conditions.
    d. Performranking andsortingoperations.
    e. Dorequiredstatisticaloperationsonthegivencolumn
7. Import anyCSVfiletoPandasData Frameandperformthefollowing:

a. Handlemissing databydetectinganddropping/ fillingmissingvalues.
b. Transformdatausing apply()andmap()method.
c. Detectandfilteroutliers.
d. PerformVectorizedStringoperationsonPandasSeries.
e. VisualizedatausingLinePlots,BarPlots,Histograms,DensityPlotsandScatterPlots.

VSemester

Course15A:IoTApplicationsDevelopmentandProgramming

Theory 03hours/Week Credits-3

LearningObjectives:

Toenablestudentstodevelop IoTsolutionsforreal-worldproblems

LearningOutcomes: Onsuccessfulcompletionofthecourse,studentswill beableto

1. UnderstandtheBasicConceptsofInternetofThings
2. LearnvariousSensorsand theirassociativeprotocols
3. LearntheSingleBoardComputersfordevelopment ofIoT
4. BuildtheIoTdeviceswiththeNode-REDwithoutComplexcoding
5. Developvarious IoTreal-timeapplications

UNIT-I

Overview of the Internet of Things (IoT) and Sensors: Sensors - Energy-based, Signal Output,ModeofOperation,ElectronicSensors.Connectivity-Bluetooth,Zigbee,Wi-Fi,LoRa,WiredCommunication. Machine Intelligence, Active Management, Sensor Fusion, Smart Devices- Human-Computer Interaction, Context Awareness, Actuators, IoT and Smart City Applications- AutomobileSensors,Smart HomeSensors,SmartTransportation Sensors.

UNIT-II

IoT Sensors and Their Interfacing Protocols: Vision and Imaging Sensors- Line Scan Cameras,3D Depth Cameras, **Sensors That Measure Temperature**-Thermocouples, Resistance TemperatureDetector (RTD), Temperature Thermistor Sensors, Semiconductor Temperature Sensors, RadiationSensors;ProximitySensors,PressureSensors,PositionSensors,Photoelectric Sensors,ParticleSensors,TypesofParticleSensors-MetalDetectors,LevelSensors,LeakDetectors,HumiditySensors,GasandChemicalSensors,GasDetectors,CarbonMonoxide(MQ7) Detectors,FlameDetectors,**SensorCommunicationProtocols**

UNIT-III

Programming Single Board Computers: Arduino Programming, Raspberry Pi-BasicfunctionalityofRaspberryPi B+board,settingup theboard,configurationanduse,BasicsofLinuxanditsuse,IntroductiontoRaspberryPiGPIOAccess,InterfacingDHT,InterfacingPicamtoRaspberryPizerow,PiCameraSpecifications,PiCameraAccess,Interfacing PIRSensor**Python:**

File Concepts, Spreadsheet Concepts, Communication Concepts, Wired and WirelessProgrammingConcepts

UNIT-IV

Node-RED: Node-RED Features, Installation of Node-RED, Node-RED Architecture, Node-REDFlow Editor, Basic Function Nodes, Node-RED Library, Node-RED Applications; MQTT Protocols,GoogleSheetsProgramming(gspread),FirebaseProgramming,Matplotlib-GettingStarted,BarGraphs, Scatter Plot, Spectrum Representation, Coherence of Two Signals, Cross-Correlation Graph,Autocorreleation Graph, Changing Figure Size in Different Units, Scale Pie Charts, Style Sheets-FiveThirtyEightStyleSheet,Solarized Light StyleSheet.

UNIT-V

Wireless Connectivity in IoT: Introduction, Low-Power Wide-Area Networks (LPWANs),RFIDProtocol,XBEERadioswithArduino,BluetoothwithArduino,ArduinowithaGSMModem,Arduinowith FirebaseCloud Connectivity

TheInternetofThingsthroughtheRaspberryPi: Introduction,ClusterComputingwithRaspberry Pi Zero W-Message Passing Interface (MPI), Networking with RP is for Simple MPIScripts,Simple MPIProgramming

TextBook(s)

1. **InternetofThingsUsingSingleBoardComputers**,*G.R.Kanagachidambaresan*,Apress,2022.
2. **PracticalNode-REDProgramming**,*TaijiHagino*,PacktPublishing,2021

ReferenceBooks

1. **InternetofThingsProgrammingProjects:BuildmodernIoTsolutionswiththeRaspberryPi 3 and Python,***ColinDow***,**PacktPublishing,2021
2. **ProgrammingtheInternetofThings:AnIntroductiontoBuildingIntegrated,Device-to-CloudIoT Solutions,** *AndyKing***,** O'ReillyMedia,2021

SUGGESTEDCO-CURRICULARACTIVITIES &EVALUATIONMETHODS:

Unit1:Activity: CaseStudyPresentationonSmartCityIoTrealization

EvaluationMethod: Contentknowledge,organization,clarity,presentationskills,visualaids,audience engagement

Unit2:Activity: PosterPresentation forvariouskindsofSensors

EvaluationMethod: Creative&informativepostersorinfographicsonSensors

Unit3:Activity: Hands-on Labusing RPi.

EvaluationMethod: LabPerformanceandCorrectnessofsolutionImplementation

Unit4:Activity: Hands-onLabActivityonNode-RED

EvaluationMethod: LabPerformanceandCorrectnessofsolutionImplementation.

Unit5:Activity: GuestLectureorExperttalkonCloud basedIoTplatforms

EvaluationMethod: ActiveParticipation,PostTalkreportpresentation

VSemester

Course15A:IoTApplicationsDevelopmentandProgramming

Credits-1

ListofExperiments:

1. Writeaprogramtoswitchlightonwhentheinputis1andswitchthelightoffwhentheinputis 0 using Raspberry pi
2. InstallNode-REDand Flow-basedProgrammingDevelopmentEnvironment
3. CreateBasic FlowswithMajorNodes
4. DevelopaNode-RedFlowforvariousCaseStudies
5. ImplementNode-REDintheCloudCallingaWebAPIfrom Node-RED
6. CreateaToDoApplicationwith Node-REDHandlingSensorDataontheRaspberry Pi
7. DevelopaDashboardwith various2DGraphswithMatplotlib
8. InstallMySQLdatabaseinRaspberrypi.
9. WriteaprogramtoworkwithbasicMySQLqueriesbyfetchingdatafromdatabaseinRaspberrypi.
10. ArduinowithFirebaseCloudConnectivity
11. VisualizeDatabyCreatingaServer-sideApplicationintheFirebase

VSemester

Course15B:ApplicationDevelopmentusingPython

Credits-3

LearningObjectives:

Toenablestudentstodevelop IoTsolutionsforreal-worldproblems

LearningOutcomes: Onsuccessfulcompletionofthecourse,studentswill beableto

1. ExaminePythonsyntaxandsemanticsandbefluentintheuseofPythonflowcontrolandfunctions.
2. DemonstrateproficiencyinhandlingStringsandFileSystems.
3. Create,runandmanipulatePythonProgramsusingcoredatastructureslikeLists,Dictionariesanduse RegularExpressions.
4. Interprettheconcepts ofWebProgramming and GUIinPython
5. ApplyconceptsofPythonprogramminginvariousfieldsrelatedtoIOT,WebServicesandDatabasesi n Python.

UNIT-I

Python basics, Objects- Python Objects, Standard Types, Other Built-in Types, Internal Types,StandardTypeOperators,StandardTypeBuilt-inFunctions,CategorizingtheStandardTypes,UnsupportedTypes

Numbers - Introduction to Numbers, Integers, Floating Point Real Numbers, Complex Numbers,Operators,Built-in Functions, RelatedModules

Sequences-Strings,Lists,andTuples,DictionariesandSetTypes

ControlFlow,Truthiness,Sorting,ListComprehensions,Generatorsand Iterators

UNIT-II

Files: FileObjects,FileBuilt-inFunction[open()],FileBuilt-inMethods,FileBuilt-inAttributes,StandardFiles, Command-lineArguments, FileSystem, File Execution

Exceptions: ExceptionsinPython,DetectingandHandlingExceptions,ContextManagement,Exceptionsas Strings,RaisingExceptions,Assertions,StandardExceptions,CreatingExceptions,Why Exceptions (Now)?, Why Exceptions at All?, Exceptions and the sys Module, Related Modules**Modules:**ModulesandFiles,Namespaces,ImportingModules,ImportingModuleAttributes,ModuleBuilt-in Functions,Packages, OtherFeatures of Modules

UNIT-III

Regular Expressions: Introduction, Special Symbols and Characters, Res and Python**MultithreadedProgramming**: Introduction, Threads and Processes, Python, Threads, and the Global InterpreterLock,ThreadModule, ThreadingModule, Related Modules

UNIT-IV

GUI Programming: Introduction, Tkinter and Python Programming, Brief Tour of Other GUIs,RelatedModulesand Other GUIs

WebProgramming: Introduction,WedSurfingwithPython,CreatingSimpleWebClients,AdvancedWeb Clients,CGI-HelpingServersProcessClientData,BuildingCGIApplication,AdvancedCGI,Web(HTTP) Servers

UNIT-V

DatabaseProgramming: Introduction,PythonDatabaseApplicationProgrammer'sInterface(DBAPI),Obj ect Relational Managers(ORMs), Related Modules

TextBook(s)

1. CorePythonProgramming,Wesley J.Chun,SecondEdition, Pearson.
2. ThinkPython,AllenDowney,GreenTeaPress.

ReferenceBooks

1. IntroductiontoPython,KennethA.Lambert,Cengage.
2. PythonProgramming: AModernApproach,VamsiKurama,Pearson.
3. LearningPython,MarkLutz,O'Really.

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity: Hands-onLabexercise onPython ControlStatements
EvaluationMethod: LabPerformanceandCorrectnessofsolutionImplementation

Unit2:Activity: Assignment ofFilesinPython
EvaluationMethod: ProblemSolving,Accuracy

Unit3:Activity: ExercisesonRegularexpressions
EvaluationMethod: Solutions,AccuracyofValidation

Unit4:Activity: PosterPresentation on variousGUIcomponentsin Python
EvaluationMethod: Contentknowledge,organization,clarity,presentationskills,visualaids.

Unit5:Activity: GroupProject
EvaluationMethod: Projecteffectiveness,Userinterface,SolutiontotheProblem

VSemester

Course 15 B:ApplicationDevelopmentusingPython

Credits-1

ListofExperiments:

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsiusandviceversadependingupon user's choice.
2. Write a python program to calculate total marks, percentage and grade of a student. Marksobtained in each of the three subjects areto be input by the user. Assign grades accordingtothefollowing criteria:

   GradeA:Percentage>=80GradeB:Percentage>=70and80

   GradeC:Percentage>=60and<70GradeD:Percentage>=40and<60GradeE:Percentage<40

3. DemonstratevariousmethodsofSequenceDataTypes
4. Writeapythonprogram todisplaythefirstntermsofFibonacciseries.
5. Writeapythonprogramto calculatethesumand productoftwocompatiblematrices.
6. WriteafunctionthattakesacharacterandreturnsTrueifitisavowelandFalseotherwise.
7. Writeaprogramtoimplement exceptionhandling.
8. WriteaprogramtoimplementMultithreading
9. DevelopaPython GUIcalculatorusingTkinter
10. WriteaPythonprogramtoread last5 linesof afile.
11. Designasimpledatabaseapplicationthatstorestherecordsandretrievethe same
12. Designadatabaseapplicationtosearchthespecifiedrecordfromthedatabase.
13. Designadatabaseapplicationtothatallowstheusertoadd,deleteandmodifytherecords.

VIISemester

Course16A:Advanced DataStructures

Credits-3

LearningObjective:

Tofamiliarizewiththeorganizationofdatasoastooptimizethesearchingtime

LearningOutcomes: Uponcompletion ofthecourse, studentswillbeableto:

1. Applyappropriatehashingtechniquesforagiven problem.
2. Simulatetheoperations ofHeaptrees.
3. Providesolutionsusingmulti-waysearchtrees.
4. Chooseappropriate algorithm whileestablishing anetwork.
5. Applytheknowledgeof disjoint sets forsolvingagivenproblem.

UNIT-I

Hashing – General Idea, Hash Function, Separate Chaining, Hash Tables without linked lists: LinearProbing,QuadraticProbing,DoubleHashing,Rehashing,HashTablesintheStandardLibrary,UniversalHashing, Extendible Hashing.

UNIT-II

Priority Queues (Heaps) – Model, Simple implementations, Binary Heap: Structure Property, HeapOrder Property, Basic HeapOperations: insert, delete, Percolatedown,otherHeap Operations.

BinomialQueues: BinomialQueueStructure,BinomialQueueOperations,ImplementationofBinomialQueue, PriorityQueues in the StandardLibrary.

UNIT-III

Trees–**AVL**:SingleRotation, DoubleRotation,B-Trees,B^+Trees

Multi-waySearchTrees–2-3Trees:Searchingforanelementina2-3Tree,insertinganewelementin a2-3 Tree, deleting an element froma2-3 Tree.

Red-BlackTrees–Propertiesofred-blacktrees,rotations,insertion,deletion.

UNIT-IV

GraphAlgorithms–

ElementaryGraphAlgorithms:Topologicalsort,SingleSourceShortestPathAlgorithms:Dijkstra's,Bellman-Ford,All-PairsShortestPaths:Floyd-Warshall'sAlgorithm.

UNIT-V

VIISemester

DisjointSets–Equivalencerelation,BasicDataStructure,SimpleUnionandFindalgorithms, SmartUnionandPathcompressionalgorithm.

TextBooks:

1. FundamentalsofComputerAlgorithms,EllisHorowitz,SatrajSahaniandRajasekharam,2ndEdition ,2009, University Press Pvt. Ltd.
2. Advanced DataStructures,ReemaThareja,S.RamaSree,OxfordUniversityPress,2018.

ReferenceBooks:

1. DataStructuresandAlgorithmAnalysisinC++,MarkAllenWeiss,4thEdition,2014,Pearson.
2. IntroductiontoAlgorithms,ThomasHCormen,CharlesE.Leiserson,RonaldL.Rivest,CliffordStein , 3 rd Edition, 2009, TheMIT Press.

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity: Quizonhashingtechniques,coveringconcepts,algorithms, andapplications.

EvaluationMethod: Assessstudents'understandingofhashingtechniquesthroughquizscoresand performance.

Unit2:Activity: SeminaronHeapTrees

EvaluationMethod: Evaluatetheclarity,depthofunderstanding,andpresentationskillsdemonstratedin theseminar.

Unit3: Activity: GroupProjecttodesignandimplementamulti-waysearchtreedatastructure,alongwithalgorithms for insertion, deletion, and searching.

EvaluationMethod: Functionality,correctness,andefficiencyofthemulti-waysearchtreeimplementation.

Unit4:Activity: RolePlaytosimulatetheprocessofestablishinganetwork,makingalgorithmicdecisions along theway.

EvaluationMethod: Students'understandingandapplicationofnetworkestablishmentalgorithmsthrough theirdecision-making processduring theroleplay.

Unit 5: Activity: Puzzle Challenge that can be solved using disjoint sets, and encourage them toapplytheirknowledgeto find asolution.

EvaluationMethod: Assessthecorrectnessandefficiencyofstudents'solutionstothepuzzleorproblem involvingdisjoint sets.

VII

SemesterCourse16A:Advanced DataStructures

Credits-1

ListofExperiments:

1. ImplementLinearprobingHashingTechnique.
2. ImplementQuadraticprobingHashingTechnique.
3. ImplementBinaryHeap anditsoperations.
4. ImplementAVLTrees anditsoperations.
5. ImplementtheoperationsonBTrees
6. Implement2-3Treesand itsoperations.
7. ImplementtheoperationsofRed-Blacktrees
8. ImplementDijkstra'sshortestpathalgorithm.
9. ImplementBellman-Ford shortestpathalgorithm.
10. ImplementFloyd-Warshall'sAlgorithm.
11. Implementdisjointsets anditsoperations.
12. ImplementUnionandFindalgorithms

VII SemesterCourse16B:ArtificialIntelligence

Credits-3

LearningObjective:

To provide students with a comprehensive understanding of artificial intelligence (AI) principlesandtechniques

LearningOutcomes: Studentsaftersuccessfulcompletionofthecoursewillbeableto:

1. AnalyzeAIproblemsandsearchtechniquesusingunderlyingassumptionsandAItechniques.
2. Applyheuristicsearchtechniquesforproblem-solvingandoptimization.
3. Understandknowledgerepresentationapproachesandapplypredicatelogicforrepresentingfactsandrelationships.
4. Utilizerule-basedsystemsforrepresentingknowledgeandapplyreasoningtechniquesforproblem-solving.
5. Implementsymbolicreasoningunderuncertaintyandaugmentproblem-solvingstrategieswithnon-monotonicreasoning.

UNIT-I

ProblemsandSearch:WhatisArtificialIntelligence,TheAIProblems,andUnderlyingAssumption,what is anAITechnique?

Problems,ProblemsSpaces,andSearch:Definingtheproblemasastatespacesearch,productionsystems,problems characteristics,issuesinthedesignofsearchprograms.

UNIT-II

HeuristicSearchTechniques:Generate-and-test,HillClimbing,Best-FirstSearch,ProblemReduction,Constraint Satisfaction, Means-EndsAnalysis

UNIT-III

KnowedgeRepresentationIssues:RepresentationsandMapping,ApproachestoKnowledgeRepresentation,Theframeproblem.UsingPredicateLogic:Representingsimplefactsinlogic,RepresentingIsarelationships, predicates, Resolution

UNIT-IV

Representing Knowledge using Rules: Procedural Vs Declarative knowledge, Logic Programming,ForwardVs BackwardReasoning,Matching, Control Knowledge

UNIT-V

SymbolicReasoningunderUncertainty:IntroductiontoNon-monotonicReasoning,LogicsforNon-monotonic Reasoning, Implementation issues, Augmenting a Problem solver, implementation:DFS,BFS.

StatisticalReasoning:ProbabilityandBayesTheorem,CertaintyFactorsandRule-BasedSystems,BayesianNetworks, Dempster-**Shafer**Theory.

TextBooks:

1. Russell,S.,&Norvig,P.Artificialintelligence:aModernapproach.ThirdEdition.Pearsonnewinternationaledition. 2014.

ReferenceBooks:

2. ArtificialIntelligence,SecondEdition,ElaineRich,KevinKnight,TataMcGraw-HillEdition.

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity: Groupdiscussiononreal-worldAIproblemsandpossiblesearchtechniques.

EvaluationMethod: Active Participation,Presentationandanalysisof group discussionoutcomes.

Unit2:Activity: Problem-solvingtasksusingheuristicsearchalgorithms.

EvaluationMethod: Assessmentofproblem-solvingapproachandsolution quality.

Unit3:Activity: Hands-onactivitytocreateknowledgerepresentations usingpredicatelogic.

EvaluationMethod: Evaluationofknowledgerepresentationaccuracyandlogicalreasoning.

Unit4:Activity: Scenario-basedproblem-solvingusing rule-basedsystems.

EvaluationMethod: Assessmentofproblem-solvingapproachandsolutioneffectiveness.

Unit5:Activity: Simulation activitytoimplementsymbolicreasoningunderuncertainty.

EvaluationMethod: Evaluationofsimulationresultsandreasoningaccuracy.

VII SemesterCou

rse16B:ArtificialIntelligence

Credits-1

ListofExperiments:

1. WriteaProgramto Implement BreadthFirstSearch
2. WriteaProgram toImplementDepthFirstSearch
3. WriteaProgramtoImplementTic-Tac-Toegame.
4. WriteaProgram toimplement8-Puzzleproblem
5. WriteaProgram toImplementWater-Jugproblem
6. WriteaProgram toImplementTravelling Salesmanproblem
7. WriteaProgram toImplementTowersofHanoiproblem
8. WriteaProgram toimplement8-Queensproblem

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VIISemester

Course17A:ComputerGraphics

Credits-3

LearningObjective:

ToDevelopacomprehensiveunderstandingofcomputergraphicsprinciples,techniques,andalgorithms,and apply them to createvisually appealing 2D and 3D graphics.

LearningOutcomes:

Studentsaftersuccessfulcompletionofthecoursewill beableto:

1. Understandcomputergraphicsfundamentals
2. Perform2Dand3D
3. Applywindow-to-viewporttransformationandperformlineandpolygonclippingoperations.
4. Determinevisiblesurfacesandapplycomputergraphicsalgorithmsfordepthcomparison,back-faceremoval,and rendering.
5. Applyanimationprinciples,workwithFlashinterface,andgainanintroductiontovirtualreality.

UNIT-I

Introduction: Advantage of Computer Graphics and Areas of Applications, Hardware andSoftwarefor Computer Graphics- Hard Copy, Display Technologies, Random Scan Display System, VideoController, Random Scan Display Processor, Raster Graphics, Scan Conversion Algorithms (Line,Circle,Ellipse),AreaFilling(Rectangle,Ellipse),Clipping(Lines,Circle,Ellipse),ClippingPolygons

UNIT-II

Twodimensionalandthree-dimensionaltransformations:2-Dimensionaltransformation,2-DTranslation,Rotation,Scaling,HomogeneousCoordinates,Reflection,Sheartransform,3-dimensional transformation,3-DTranslation, Rotation Scaling, Reflection,Shear.

UNIT-III

Clipping: Window to view port transformation, Clipping, line clipping, Cohen —Sutherland lineclipping,Polygon clipping, Sutherland and Gary Hodgman polygon clipping algorithm

UNIT-IV

Visible Surface Determination and Computer Graphics algorithm: Image space and object spacetechniques, Hidden Surface removal—Depth comparison Z-Buffer Algorithm, Back-Face Removal,ThePainter'sAlgorithm,Scan-LineAlgorithm,LightandColoranddifferentcolormodels(RGB,CMY,YIQ)

UNIT-V

AnimationandVirtualReality: BasicPrinciplesofAnimationandTypesofAnimation,Introduction to the flash interface: Setting stage dimensions, working with panels, panel layouts,Layers & Views, Shaping Objects – Overview of shapes, Drawing & Modifying Shapes, BitmapImages& Sounds Animation-Principles,Framebyframeanimation,tweening,masks,Introductiontovirtualreality.

TextBooks

1.Foley,J.D.,A.V.Dam,S.K. Feiner,J.F.Hughes,ComputerGraphicsPrincipleandPractices,Addison Wesley Longman, SingaporePvt. Ltd.,

ReferenceBooks

1. HearnDonald,M.P.Baker,ComputerGraphics,2E,PrenticeHallofIndiaPrivateLimited,New Delhi
2. RobertR&SnowDFlashCS4Professional Bible,WileyPublishing

SUGGESTEDCO-CURRICULARACTIVITIES &EVALUATIONMETHODS:

Unit1:Activity: Quizoncomputergraphicsconcepts andterminology.

EvaluationMethod: Knowledgeofcomputergraphics principlesandconcepts

Unit2:Activity: Hands-onlabsessionson 2Dand3Dgraphicsprogramming.

aluation Method: Practical assignments evaluating the implementation of 2D and 3Dgraphicsoperations

Unit3:Activity: GroupProjectonwindow-to-viewporttransformationandclipping algorithms

EvaluationMethod: Projecteffectiveness,Functionality,SolutiontotheProblem

Unit4:Activity: Seminaronvisiblesurfacedetermination algorithmsandrenderingtechniques

EvaluationMethod: Presentationanddemonstrationofprojectsshowcasingtheapplicationofrendering algorithms andsurfaceremoval

Unit5:Activity: WorkshoponanimationprinciplesandFlashinterfaceusage,hands-onexperiencewithvirtual realitytechnologies andtools

EvaluationMethod: Individualprojectsdemonstratingtheapplicationofanimationprinciples,Flash interfaceusage,and virtual reality

VIISemester
Course17A:ComputerGraphics
Credits-1

ListofExperiments:

1. ImplementBrenham's linedrawingalgorithmforall typesofslopes
2. Implement areafilling algorithms
3. Createandrotatealine about afixedpoint andorigin.
4. Createandrotateatriangleabouttheorigin andafixedpoint.
5. DrawacolorcubeandspinitusingOpenGLtransformationmatrices.
6. ClipalineusingCohen-Sutherlandalgorithm.
7. Implementpolygonclippingalgorithm
8. ImplementZ-bufferalgorithm
9. ImplementPainter'salgorithm.
10. Implementtweening

VIISemester

VIISemester

Course17B:DesignandAnalysisofAlgorithms

Credits-3

LearningObjectives:

Todesign,develop andanalyzealgorithmstoprovideoptimalsolutions.

LearningOutcomes: Uponsuccessfulcompletion ofthecourse,studentswill beableto:

1. Understandthefundamental conceptsofalgorithm analysisanddesigntechniques.
2. Applydivideand conquerdesigntechniques forsolvingproblems
3. Analyzetheperformance ofgivenproblemusing greedyapproach.
4. Analyzethegivenproblemandprovidethefeasiblesolutionusingdynamicprogramming.
5. Analyzethe complexity ofagivenproblem.

UNIT-I

Introduction: NotionofAlgorithm,Fundamentals ofAlgorithmicProblemSolving.

FundamentalsoftheAnalysisofAlgorithmEfficiency: AnalysisframeworkandAsymptoticNotations and Basic Efficiency Classes, Amortized Analysis. Introduction to Brute Force Technique,ExhaustiveSearch.

UNIT-II

Divide and Conquer: Introduction, Merge sort, Quick sort, Binary Search, Finding Maximum andMinimum,Strassen's Matrix Multiplication

UNIT-III

The Greedy Method: Introduction, Huffman Trees and codes, Minimum Coin Change problem,Knapsack problem, Job sequencing with deadlines, Minimum Cost Spanning Trees, Single SourceShortest paths.

UNIT-IV

Dynamic Programming: Introduction, 0/1 Knapsack problem, All pairs shortest paths, OptimalBinarysearch trees, Travelling salesman problem.

UNIT-V

BackTracking: Introduction,n-Queensproblem, Sumofsubsets,Hamiltoniancycle.

BranchandBound: Introduction,Assignmentproblem,TravellingSalesmanproblem.
IntroductiontoComplexityclasses: PandNPProblems,NPCompleteProblems.

VIISemester

TextBooks:

1. Fundamentals of computer algorithms, Ellis Horowitz, Sartaj Sahni, S. Rajasekharan, Second Edition, 2008, Universities Press.

Reference Books:

1. Introduction to the Design & Analysis of Algorithms, Anany Levitin, Third Edition, 2011, Pearson Education.
2. Data Structures and Algorithm Analysis in C, Mark Allen Weiss, 2002, Pearson.

SUGGESTED CO-CURRICULAR ACTIVITIES & EVALUATION METHODS:

Unit 1: Activity: Algorithm Design Contest.

Evaluation Method: Written exam, assessing understanding and application of algorithmic concepts

Unit 2: Activity: Seminar on Divide and Conquer Problem & Solutions.

Evaluation Method: Presentation, Concept Depth, Suitable Applications in real world domain

Unit 3: Activity: Greedy Algorithm Simulation

Evaluation Method: Simulation exercise, evaluating problem analysis and greedy approach

Unit 4: Activity: Algorithm Visualization

Evaluation Method: Visual representation of algorithms, understanding, presentation and communication skills

Unit 5: Activity: Quizon complexity analysis concepts

Evaluation Method: Understanding the Complexity classes and problem Analysis

VIISemester

Course17B:DesignandAnalysisofAlgorithmsusingJava/PythonC

Credits-1

ListofExperiments:

1. WriteaprogramtoimplementMergeSortandanalyzeitsperformance.
2. WriteaprogramtoimplementQuickSortandanalyzeitsperformance.
3. Writeaprogramtofindtheminimumandmaximuminalistofelementsandanalyzeit'sperformance.
4. WriteaprogramtoimplementMinimumCostSpanningTreesandanalyzeitsperformance.
5. WriteaprogramtoimplementSinglesourceshortestpathalgorithmandanalyzeitsperformance.
6. WriteaprogramtoimplementAllpairsshortestpathalgorithmandanalyzeitsperformance.
7. Writeaprogramtoimplement0/1knapscakproblemandanalyzeitsperformance.
8. Writeaprogramtoimplementn-Queensproblemandanalyzeitsperformance.
9. Writeaprogramtoimplementsumofsubsetsproblemandanalyzeitsperformance.
10. WriteaprogramtoimplementTravellingSalesmanproblemusingBranchandBoundapproachandanalyzeitsperformance.

VIISemester
Course18A:PrinciplesofMachineLearning
Credits-3

LearningObjectives:

Todesign,develop andanalyzealgorithms toprovideoptimalsolutions.

LearningOutcomes: Uponsuccessfulcompletion ofthecourse,studentswill beableto:

1. Understandthefeaturesofmachinelearningtoapplyonrealworldproblems.
2. Characterizethemachinelearningalgorithmsassupervisedlearningandunsupervisedlearning,apply andanalyzethevariousalgorithmsofsupervisedandunsupervised learning.
3. Analyzethe conceptofneuralnetworksforlearninglinearandnon-linear activationfunctions.
4. Identifyanappropriateclustering techniquetosolverealworldproblems.
5. Chooseasuitablemachinelearningmodel,implementandexaminetheperformanceofthechosenmodel foragivenrealworld problems.

UNIT-I:

Introduction: WhatisMachineLearning,ExamplesofVariousLearning Paradigms,PerspectivesandIssues,Version Spaces,Finite andInfiniteHypothesisSpaces, PACLearning

UNIT-II

LearningaClassfromExamples,Linear,Non-linear,Multi-classandMulti-labelclassification,Generalization error bounds: VC Dimension, **Decision Trees:** ID3, Classification and RegressionTrees,Regression: Linear Regression, MultipleLinearRegression, Logistic Regression.

UNIT-III

Neural Networks: Introduction, Perceptron, Multilayer Perceptron, Support vector machines: LinearandNon-Linear,KernelFunctions,K-Nearest Neighbors.

UNIT-IV

Introduction to clustering, Hierarchical: AGNES, DIANA, Partitional: K-means clustering, K-ModeClustering,Self-OrganizingMap,ExpectationMaximization,GaussianMixtureModels,Principalcomponents analysis (PCA)

UNIT-V

Machine Learning in Practice Design, Analysis and Evaluation of Machine Learning experiments,FeatureselectionMechanisms, otherissues:Imbalanceddata,missing values,Outliers.

TextBooks:

VIISemester

1.EthemAlpaydin,IntroductiontoMachineLearning,MITPress,PrenticeHallofIndia,Third Edition2014

ReferenceBooks:

1. Machinelearning,Dr.S.SridharandM.VijayaLakshmi, OxfordUniversity Press,2021.
2. TomMitchell,MachineLearning,McGrawHill, 3rdEdition,1997.
3. SergiosTheodoridis,KonstantinosKoutroumbas,PatternRecognition,AcademicPress,4thedition, 2008, ISBN:9781597492720
4. CharuC.Aggarwal,Data ClassificationAlgorithmsandApplications,CRCPress,2014
5. CharuC.Aggarwal,DATACLUSTERINGAlgorithmsandApplications,CRCPress,2014

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity: CaseStudy ofreal-worldapplications ofMachineLearning

EvaluationMethod: Presentation,ConceptDepth,SuitableApplicationsinrealworlddomain

Unit2:Activity: SeminaronSupervisedMachineLearningAlgorithms

EvaluationMethod: Presentation,ConceptDepth,SuitableApplicationsinrealworlddomain

Unit3:Activity: Neural NetworkActivationFunctionExploration

EvaluationMethod: Hands-onactivity,evaluatingtheunderstandingandanalysisoflinearandnon-linearactivationfunctions

Unit4:Activity: CaseStudy on Clustering

Evaluation Method: Analyzing real-world clustering problems, evaluating the ability toidentify and apply appropriate clustering techniques for solving real-worldproblems

Unit5:Activity: ProjectworkonMachineLearning Models

Evaluation Method: Real-world project implementation, evaluating the ability to chooseandimplement a suitable machine learning model for solving real-worldproblems

VIISemester

Course18A:PrinciplesofMachineLearningLabusingPython/R

Credits-1

ListofExperiments:

1. ImplementDecisionTreelearning.
2. ImplementLogisticRegression.
3. ImplementclassificationusingMultilayerperceptron.
4. Implement classification usingSVM
5. ImplementK-meansClusteringtoFindNaturalPatternsinData.
6. ImplementK-modeClustering
7. ImplementHierarchicalclustering.
8. ImplementPrincipal ComponentAnalysisforDimensionalityReduction.
9. ImplementMultipleCorrespondence AnalysisforDimensionalityReduction.
10. ImplementGaussianMixtureModelUsingtheExpectationMaximization
11. Implementk-nearestneighbors'algorithmtoclassifytheirisdataset.Printbothcorrectandwrongpredictions.Java/Python ML libraryclasses can beusedforthis problem.
12. Implementthenon-parametricLocallyWeightedRegressionalgorithminordertofitdatapoints.Select appropriatedata setforyour experiment and drawgraphs.

VIISemester

VIISemester

Course18B:SoftwareTesting

Credits-3

LearningObjectives:

Toprovidestudentswithacomprehensiveunderstandingofsoftwaretestingprinciples,methodologies, and tools, enabling them to effectively design and execute various levels of testing,automatetesting processes using Selenium andautomation frameworks.

LearningOutcomes: Uponsuccessfulcompletion ofthecourse,studentswill beableto:

1. Understandsoftwaretestingprinciplesandapplyeffectivetestcasedesignstrategies.
2. Implement andexecutedifferentlevelsoftesting
3. UtilizeSeleniumforautomationtesting,includinghandlingwebelementsandutilizingadvancedfeatures.
4. Implement andleverage automationtestingframeworksforefficienttestautomation.
5. ApplyTestNGframeworkforadvancedtestexecution,management,andparallelprocessing.

UNIT-I

Fundamentals: Software Testing Principals – Tester Role in Software Development Manual TestingandAutomation Testing

Introduction to testing design strategies: Test case design strategies – Using black box approachtotest case design – Random testing – Equivalence class partitioning – Boundary value analysis –Usingwhite box approach to test design – Test adequacy criteria – Coverage and control flow graphs – Coveringcodelogic– Paths–Their rolein whitebox-based testdesign

UNIT-II

Levels of Testing: The need for levels of testing – Unit test – Unit test planning – Designing the unittests – The class as a testable unit – The test harness – Running the unit tests and recording results –Integration tests – Designing integration tests – Integration test planning – System test –The differenttypes– Regression testing– Alpha, beta andacceptancetests

UNIT-III

Selenium Basics: Automation Testing, Introduction to Selenium and its Components, Selenium IDEFeatures, Selenium Download and Installation, Creating Scripts using Firebug and Its Installation,LocatorTypes

Selenium WebDriver: Selenium WebDriver Installation with Eclipse, Handling Dropdowns, Explicitand Implicit Wait, Handling Alerts/Pop-ups, Handling Web Tables, Frames, DynamicElements,RobotAPI, AutoIT

UNIT-IV

SeleniumFramework:Test AutomationFramework:Introduction,Benefitsof Automation Framework,TypesofAutomationframework

UNIT-V

IntroductiontoTestNG:TestNGFramework,TestNGinstallation,TestNGAnnotationsandListeners,TestNGExample, TestNGProcessExecution:Batch,ControlledBatch &Parallel

TextBooks:

1. IleneBurnstein,"PracticalSoftwareTesting",SpringerInternationalEdition,2003.
2. SrinivasanDesikanandGopalaswamyRamesh,"SoftwareTesting– PrinciplesandPractices",Pearson education, 2009.
3. TestAutomationusingSeleniumWebDriverwithJava:StepbyStepGuidebyNavneeshGarg
4. AbsoluteBeginnerJava4SeleniumWebdriver:ComeLearnHowtoProgramforAutomationTesting by Rex Allen JonesII

ReferenceBooks:

1. ElfriedeDustin,"EffectiveSoftwareTesting",PearsonEducation.
2. AdityaP.Mathur,"FoundationsofSoftwareTesting– Fundamentalalgorithmsandtechniques",Dorling Kindersley(India)Pvt. Ltd., Pearson Education

WebLinks:

https://www.softwaretestingmaterial.com/types-test-automation-frameworks/https://www.guru99.com/introduction-to-selenium-grid.html#6

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity: Groupdiscussiononsoftwaretesting challengesandstrategies

EvaluationMethod: Assessmentofparticipation andcontribution

Unit2:Activity: AssignmentonCreation andexecutionofunit tests

EvaluationMethod: Evaluationofaccuracyandcoverageofunit tests

Unit3:Activity: Debuggingandtroubleshooting oftest scripts

EvaluationMethod: Assessmentofproblem-solvingskills

Unit4:Activity: CaseStudyonAnalysisandoptimization ofautomatedtestexecution forefficiency

EvaluationMethod: Assessmentofperformance improvementandresourceusage

Unit5:Activity: TestNGreportgenerationandanalysis

EvaluationMethod: Assessmentofreportaccuracyandinsights

VIISemester

Course18B:SoftwareTestingLabusingSelenium

Credits-1

ListofExperiments:

1. StudyofsoftwaretestingtoolssuchasRationalRoseTestSuite,SeleniumTool
2. InstallationandexploringtheSeleniumIDE
3. Writeascripttoopengoogle.comandverifythattitleisGoogleandverifythatitisredirectedto google.co.in
4. Writeascripttoopengoogle.co.inusingchromebrowser(ChromeDriver)
5. Writeascripttoopengoogle.co.inusinginternetexplorer(InternetExplorerDriver)
6. Writeascripttocreatebrowserinstancebasedonbrowsername
7. Writeascript to searchforspecifiedoptionin thelistbox
8. Writeascriptto printthecontentoflistinsortedorder.
9. Writeascripttoprintalltheoptions. Forduplicates addentryonlyonce.UseHashSet.
10. Writeascriptto closeall thebrowserswithoutusing quit()method.
11. Writegenericmethodinseleniumtohandlealllocatorsandreturnwebelementforanylocator.
12. Writegenericmethodinseleniumtohandlealllocatorscontainingdynamicwaitandreturnwebelement forany locator.

VIISemester

Skillbased Course19A:AdvancedJavaProgramming

Credits-3

LearningObjectives:

To provide students with a comprehensive understanding of Java Enterprise Edition (J2EE) and itsassociatedtechnologies fordevelopingrobustandscalableweb applications.

LearningOutcomes: Uponsuccessfulcompletion ofthecourse,studentswill beableto:

1. Understandthemulti-tierarchitectureofJ2EEanditsimplementationinenterpriseapplications.
2. DevelopwebapplicationsusingJavaServletsandestablishdatabaseconnectivitywithJDBC.
3. CreatedynamicandinteractivewebpagesusingJavaServerPages(JSP)andimplementJSPwithbean s and custom tag libraries.
4. BuildenterpriseapplicationsusingEnterpriseJavaBeans(EJB)andunderstandtheirdeploymentand configuration.
5. UtilizevariousJavatechnologiessuchasJavaMail,CORBA,andJavaRMIforeffectivecommunicati onand distributed computing.

UNIT–I

J2EE Overview & Multi-tier Architecture: Overview of J2SE, J2EE, Advantages of Java, BirthofJ2EE, Why J2EE; Distributed Systems, The Tier, J2EE Multi-tier architecture,Implementation ofClient-tier, Web-tier, EJB-tier, and EIS-tier, Challenges; J2EE best practices: Enterprise ApplicationStrategy, The Enterprise Application - Client, Session Management, Web-tier and JSPs, EJB-tier,MVC, The Myth of Using Inheritance, Maintainable Classes, Performance Enhancement, Power ofInterfaces,Threads, andNotification

UNIT–II

JavaServlets&JDBC: OverviewofHTML,XML,andXHTML,JavaandXML,ParsingXML,JavaServlet s and CGI Programming, A Simple Java Servlet, Anatomy of Servlet, Life Cycle oftheServlet, Deployment Descriptor, Reading data from client, reading HTTP requestheaders, workingwith cookies, Tracking sessions. Overview of JDBC, JDBC Drivers, JDBC Packages, JDBC Process,Database Connection,Statement, ResultSet, Transaction Processing, Servlet program withJDBC.

UNIT–III

JavaServerPages: OverviewofJSP,JSPversusServlet,JSPTags:VariablesandObjects, Directives, Scripting Elements, Standard Actions, Implicit Objects, Scope, Java Server Pages withBeans, Tomcat, User Sessions, Cookies, Session Objects, JSP with JDBC, Creating Custom JSP TagLibraries.

UNIT–VI

EnterpriseJavaBeans: TheEJBContainer,EJBClasses,EJBInterfacesandDeploymentDescriptions:Anatomy,Environmentelements,referencingEJB,Sharingresources,Securityelements, Query elements, Relationship elements, Assembly elements. Session Java Beans - statelessvs stateful, Entity Java Beans - Container-managed persistence, Bean-managed persistence. Message-drivenBeans, JAR, WAR,EAR Files.

UNIT–V

JavaMail,CORBAandRMI: JavaMailAPIandJavaActivationFramework,Protocols,Exceptions, Send Email Message, Retrieving Email Messages, Deleting EmailMessage. CORBA :The Concept of Object Request Brokerage, Java IDL and CORBA, The IDL Interface. Java RMI:RemoteMethod Invocation Concept, Server Side,and Client Side

TextBooks:

1. JimKeogh:J2EE:TheCompleteReference.McGrawHill
2. H.Schildt:Java2: TheCompleteReference.Mc GrawHill

ReferenceBooks:

1. KogentSolutionsInc.:JavaServerProgrammingJavaEE7(J2EE1.7),BlackBook,DreamtechPress
2. SubrahmanyamAllaramajuetal.:ProfessionalJSPJ2EE1.3Edition.WroxPress
3. K.Qianetal.:JavaWebDevelopment Illuminated.Narosa
4. RobertW.Sebesta: ProgrammingtheWorldWide Web.Pearson

VIISemester

SkillBased Course19A:AdvancedJavaProgramming

Credits-1

ListofExperiments:

1. StudyofsoftwaretestingtoolssuchasRationalRoseTestSuite,SeleniumTool
2. WriteaJavaprogramtoretrievetheinformationfrom thegiven URL?
3. WriteajavaProgram tocreateaservlettoreadinformation fromclientRegistration page
4. WriteajavaProgramtocreateaJSP pagetodisplay asimplemessagealongwith currentDate
5. WriteajavaProgramtocreateaUserrequest pagein JSP
6. Writethefollowing(JDBC)
    a. ConnectdatabasetoJava program
    b. Programtocreatedatabasetableusing Java
    c. Programtoinsert,update,delete&select records
    d. Programtodeleterecordfrom database
    e. Programtoexecutebatch ofSQLstatements
    f. ProgramtoexecuteSQLselectquery
7. Writethefollowing(EJB)
    a. Createstatelessbeancomponent
    b. Createstateless beanclient
8. JavaMailExample-SendMailinJavausingSMTP
9. JavaRMI-Createandexecutetheserverapplicationprogram

VIISemester

Skillbased Course19B:MEANStackDevelopment

Credits-3

LearningObjectives:

To provide students with the knowledge and skills necessary to develop web applications usingmodernwebdevelopmentframeworksandtechnologies,includingJavaScript,Node.js,Express,MongoDB,and AngularJS.

LearningOutcomes: Uponsuccessfulcompletion ofthecourse,studentswill beableto:

1. Gain a comprehensive understanding of web development frameworks, JavaScriptfundamentals,and DOMmanipulation.
2. DevelopproficiencyincreatingNode.jsapplications,handlingdataI/Ooperations,andutilizing events and callbacks.
3. BuildRESTfulservicesusingNode.jsandExpressframework,masteringHTTPhandlingandrouting.
4. AcquireknowledgeandskillsinworkingwithMongoDB,performingCRUDoperations,andutilizingMongoose fordatabaseintegration.
5. Learntobuildsingle-pageapplications(SPAs)usingAngularJS,implementingtwo-waydatabindingand MVC architecture.

UNIT-I

BasicWebDevelopmentFramework,Node.js-to-AngularStackComponents

JavaScript Primer: Defining Variables, Understanding JavaScript Data Types, Operators, Looping,Creating Functions, Variable Scope, JavaScript Objects, Manipulating Strings, Workingwith Arrays,Adding Error Handling, Events and Document Object Model, HandlingJSON data, UnderstandingJSONCallbacks.

UNIT-II

Learning Node.js: Getting Started with Node.js, Understanding Node.js, Installing Node.js, Workingwith Node Packages, Concurrency and event loop fundamentals, Creating a Node.js Application,Using Events, Listeners, Timers, and Callbacks in Nodes.js: Node.js Event Model, Adding Work totheEvent Queue,ImplementingCallbacks.

Handling Data I/O in Node.js: Working with JSON, Using the Buffer Module to Buffer Data, UsingtheStream Moduleto StreamData,CompressingandDecompressingDatawithZlib

UNIT-III

Understanding HTTP Services in Node.js: Processing URLs, Processing Query Strings and FormParameters, Understanding Request, Response, and Server Objects. Implement HTTP Clients andServersin Node.Js

Building REST services using Node JS REST services, Installing Express JS, Express Node projectstructure, Building REST services with Express framework, Routes, filters, template engines – Jade,ejs.

UNIT-IV

Understanding NoSQL and MongoDB: Why NoSQL? , Understanding MongoDB, MongoDB DataTypes, MongoDB Basics and Communication with Node JS Installation, CRUD operations, Sorting,Projection, Aggregation framework, MongoDB indexes, Connecting to MongoDB with Node JS,Introduction to Mongoose, Connecting to MongoDB using mongoose, Defining mongoose schemas,CRUDoperations using mongoose.

UNIT-V

Building Single Page Applications with AngularJS Single Page Application – Introduction, Two-waydata binding(Dependency Injection), MVC in Angular JS, Controllers, Getting userinput,Loops,Client side routing – Accessing URL data, Various ways to provide data in Angular JS – Services andFactories,Workingwithfilters,DirectivesandCookies,Thedigestloopanduseof $apply.

TextBooks:

1. SimonHolmes,"GettingMEANwithMongo,Express,Angular,andNode",SecondEdition,Manning Publications; 1 edition
2. Node.js,MongoDBandAngularWebDevelopment,BradDayley,BrendanDayley,CalebDayley,PearsonEducation Inc., 2nd Edition, 2018

ReferenceBooks:

1. JeffDickey, "WriteModernWebAppswithMeanStack", Peachpitpress,2015
2. KenWilliamson,"LearningAngularJS",O′Reilly;1edition
3. MithunSatheesh,"WebdevelopmentwithMongoDBandNodeJS",PacktPublishingLimited;2nd Revised edition.

SUGGESTEDCO-CURRICULARACTIVITIES

1. Trainingofstudentsby relatedindustrialexperts.
2. Assignments

3. Seminars,Groupdiscussions,Quiz,Debatesetc.(onrelatedtopics).
4. Buildingchatapplicationusingwebsocket.
5. BuildrealtimedashboardinMEANstackusingwebsocket
6. DevelopaCURDAPPforCollegeStudentDatabase

VIISemester

SkillbasedCourse19B:MEANStackDevelopment

Credits-1

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1. InstallingtheNode.jsanditsdependencies
2. CreatingaNode.jsapplication
3. ImplementinghttpservicesinNode.js
4. ImplementingsocketservicesinNode.js
5. CreateregistrationandloginformswithvalidationsusingJscriptquery
6. Jscripttoretrievestudentinformationfromstudentdatabaseusingdatabaseconnectivity.
7. BuildingMongoDB environmentandmanagingcollection
8. ManipulatingMongoDBdocumentsfromNode.js
9. DevelopanddemonstrateInvoking datausingJscript fromMongoDB.
10. ImplementingExpressin Node.js
11. ImplementthefollowinginAngularJS
    a. AngularJS databinding.
    b. AngularJS directivesandEvents.
    c. UsingangularJSfetchingdatafromMySQL.
12. UnderstandingAngularandCreatingabasicAngularapplication
13. CreateanOnlinefeepaymentformusing JScriptandMongoDB.

VIISemester

Skillbased Course20A:MobileApplicationDevelopment

Credits-3

LearningObjectives:

To provide students with a comprehensive understanding of mobile application development usingtheAndroidplatform.

LearningOutcomes: Uponsuccessfulcompletion ofthecourse,studentswill beableto:

1. Gainasolidunderstandingofmobileapplicationdevelopmentprinciples
2. DevelopproficiencyinsettinguptheAndroiddevelopmentenvironment
3. Acquirethenecessaryskillstohandleandmanage Android resourceseffectively
4. Developexpertiseindesigninguserinterfaces byutilizingawiderangeofUIwidgets
5. LearnvariousstoragetechniquesinAndroidandUnderstandhowtointegratewebapplications

UNIT-I

MobileApplicationDevelopmentIntroduction,advantages,differencebetweenmobileapplication,Web application and HybridApplication.

Android Operating System Introduction, Android Versions with Features, Android Architecture,OHA

UNIT-II

Android Application Development Environment: Introduction of Android Studio, Android SDK,Android Development Tools, Android Virtual Devices, Directory Structure of Android Application,Activity&Application LifeCycle, AnatomyofAndroid Application,AndroidManifest File

UNIT-III

Android Terminologies & Resource handling Terminologies: Context, Activity, Intent,Service,BroadcastReceiver,Fragment

Resources: Working with Different Types of Resources Like String, Dimen, Integer, Drawable,Color,Style, Material Design etc.

Animation: TweenAnimationandFramebyFrameAnimation

UNIT-IV

UIWidgets: TextView,Button,EditText,CheckBox,RadioButton&RadioGroup,AutoCompleteTextView,Spinner,ImageView,Seekbar, ProgressBar, Dialogs

Android Layouts, Menu and Views Layouts: Linear Layout, Absolute Layout, Frame Layout,Relative Layout, Constraint Layout Creation of Layout Programmatically Menu: Option, Context**Views**:Adapters, ListView, ScrollView,WebView,CardView, RecyclerView

UNIT-V

AndroidStorageTechniques:SharedPreferences,Files&Directories,SQLiteDatabaseConnectivity&Operations,SharingDataBetweenApplication Using ContentProviders.

WebApplicationIntegrationTechniquesandAndroidAPIs:IntroductionofJSON,JSONParsing, Networking API, Telephony API, Web API, Building and Publishing Application to OnlineApplicationStore

TextBooks:

1. LaurenDarceyandShaneConder"AndroidWirelessApplicationDevelopment",2ndEdition,Pearson Education,
2. DavidGriffithsandDawnGriffiths,"HeadFirstAndroidDevelopment:ABrainFriendlyGuide",O` Reilly

ReferenceBooks:

1. MarkLMurphy,"Beginning Android",Apress,2011
2. PrasannaKumarDixit,"Android",VikasPublishing HousePvtLtd.
3. DavidMark,JackNutting,JeffLaMarch, "Beginning iOS6Development",Apress

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity: MobileAppDevelopment Workshop

EvaluationMethod: Students'understanding throughapractical project wherethey

developabasicmobileapplication.

UnitII:Activity: Android StudioSetupandConfigurationSession

EvaluationMethod: SuccessfulinstallationandconfigurationoftheAndroidStudiodevelopmenten vironment.

UnitIII:Activity: ResourceManagementChallenge

EvaluationMethod: Students'abilitytoefficientlymanageandutilizedifferenttypesofAndroidres ources throughapractical exerciseorassignment.

UnitIV:Activity:UIDesign Competition

EvaluationMethod:Creativity,usability,andimplementationofUI designsusingvariousUIwidgets.

UnitV:Activity: WebIntegrationHackathon

EvaluationMethod: Functionality,userexperience,andsuccessfuldatasharingbetweenthetwoco mponents during the hackathon.

VIISemester

Skillbased Course20A:MobileApplicationDevelopmentwithAndroid

Credits-1

ListofExperiments:

1. StudyofvariousIDEsforAndroiddevelopment
2. Setting upAndroidStudioinWindows
3. Developanapplication thatusesGUIcomponents,Font andColours
4. Developan applicationthatusesLayoutManagersandeventlisteners.
5. Writeanapplication thatdrawsbasicgraphical primitives onthescreen.
6. Developanapplicationthatmakesuseofdatabases.
7. Developanapplication thatmakesuseofNotification Manager.
8. Implementanapplication thatusesmulti-threading.
9. DevelopanativeapplicationthatusesGPSlocationinformation
10. Implement anapplication that writesdatatotheSDcard.

11. Implement anapplication thatcreatesanalertupon receivingamessage
12. WriteamobileapplicationthatmakesuseofRSSfeed
13. Developamobileapplicationtosendan email.

VIISemester
Skillbased Course20B:RProgramming
Credits-3

LearningObjectives:

To equip students with the knowledge and skills to effectively use R programming language for dataanalysis, including data manipulation, visualization, and statistical modeling, enabling them to makedata-drivendecisions andinsights.

LearningOutcomes: Uponsuccessfulcompletion ofthecourse,studentswill beableto:

1. Gainasolidunderstanding ofRprogramming language
2. Acquireknowledgeandskillsinmanipulatingmatrices,lists,anddataframes,includingperformingoperations andapplying functions.
3. Developtheabilitytocreateuser-definedfunctions,handlevariablescope,andperformexploratorydataanalysis, includingdatapreprocessing anddescriptive statistics.
4. Learn various data visualization techniques in R, including basic and advancedvisualizations,as well ascreating 3D plots.
5. GainproficiencyininferentialstatisticsandregressionanalysisusingR,includingsimplelinearregression and multiple linear regression.

UNIT-I

Introduction to R- Features of R - Environment - R Studio. Basics of R-Assignment - Modes - Operators-specialnumbers-Logicalvalues-BasicFunctions-Rhelpfunctions-RDataStructures-Control Structures.

Vectors:Definition-Declaration-Generating-Indexing-Naming-Adding&Removingelements - Operations on Vectors - Recycling - Special Operators - Vectorized if- then else-Vector EqualityFunctionsforvectors -Missingvalues-NULLvalues -Filtering &Subsetting.

UNIT-II

Matrices-CreatingMatrices-AddingorRemovingrows/columns-Reshaping-Operations–Specialfunctions on Matrices.

Lists-CreatingList–GeneralList Operations-SpecialFunctions-RecursiveLists.

DataFrames-CreatingDataFrames-Naming-Accessing-Adding-Removing-ApplyingSpecialfunctions to DataFrames-MergingDataFrames-FactorsandTables.

UNIT-III

Functions-CreatingUser-definedfunctions-FunctionsonFunctionObject-ScopeofVariables - AccessingGlobal,Environment -Closures-Recursion.

Input/Output–ReadingandWritingdatasetsinvariousformats

ExploratoryDataAnalysis-DataPreprocessing-DescriptiveStatistics-CentralTendency-Variability-Mean-Median-Range-Variance-Summary-HandlingMissingvaluesandOutliers - Normalization

UNIT-IV

DataVisualizationinR:Typesofvisualizations-packagesforvisualizations-BasicVisualizations,**Advanced Visualizations and Creating3Dplots.**

UNIT-V

InferentialStatisticswithR-TypesofLearning-LinearRegression-SimpleLinearRegression - Implementation in R - functions on lm() - predict() - plotting and fitting regression line.

MultipleLinearRegression-Introduction-comparisonwithsimplelinearregression-CorrelationMatrix-F- Statistic - Target variables Vs Predictors - Identification of significantfeatures - Implementation ofMultipleLinear Regressionin R.

TextBooks:

1. NinaZumel,JohnMount,“PracticalDataSciencewithR”,ManningPublications,2014.
2. MarkGardener,“BeginningR-TheStatisticalProgramming Language”,JohnWiley&Sons,Inc., 2012.
3. W.N.Venables,D.M.Smith andtheRCoreTeam,“An IntroductiontoR”,2013.

ReferenceBooks:

1. Jure Leskovec, Anand Rajaraman, Jeffrey D.Ullman, “Mining of MassiveDatasets”,CambridgeUniversity Press,2014.
2. NathanYau,“VisualizeThis:TheFlowingDataGuidetoDesign,Visualization,andStatistics”,Wiley, 2011.

SUGGESTEDCO-CURRICULARACTIVITIES&EVALUATIONMETHODS:

Unit1:Activity: SelfLearningthroughOnlineresources

EvaluationMethod: OnlineQuiztoaccessunderstanding.

UnitII:Activity: Hands-onLabSessionthroughDatasets

EvaluationMethod: Proficiencyinmanipulating theDatasets.

UnitIII:Activity: Data AnalysisCompetition

EvaluationMethod: Students’ability topreprocessdata,applicationofDescriptiveStatistics.

UnitIV:Activity: InfographicPresentationonDataVisualization

EvaluationMethod: Clarity,effectiveness, andaestheticsoftheircreatedvisualizations.

UnitV:Activity: Project Work

EvaluationMethod: Abilitytoapplythelearntknowledge.

VIISemester
Skillbased Course20B:RProgramming
Credits-1

ListofExperiments:

1. InstallingRandRstudio
2. Installingthe"ggplot2","caTools","CART"packagesandloadthepackages"ggplot2","caTools".
3. BasicoperationsinR
4. WorkingwithVectors:
    a. Createavector v1with elements1 to20.
    b. Add2 to everyelementof thevectorv1.

c. Divideevery element inv1by 5

d. Createavector v2with elements from21 to30. Nowaddv1 tov2.

5. GettingdataintoR,Basicdatamanipulation
6. Usingthedatapresentinthetablegivenbelow,createaMatrix“M”alsoFindthepairsofcitieswith shortest distance.

	C1	C2	C3	C4	C5
C1	0	12	13	8	20
C2	12	0	15	28	88
C3	13	15	0	6	9
C4	8	28	6	0	33
C5	20	88	9	33	0

7. Considerthefollowingmarksscored bythe6students

Section	Student no	M1	M2	M3
A	1	45	54	45
A	2	34	55	55
A	3	56	66	64
B	1	43	44	45
B	2	67	76	78
B	3	76	68	37

a. Createadatastructurefortheabovedataandstoreinproperpositionswithpropernames

b. Displaythemarks andtotals forall students

c. Displaythehighesttotalmarksineachsection.

d. Addanew subject andfill itwithmarks for2sections.

8. Loopsandfunctions -Findthe factorialofagiven number
9. ImplementationofDataFrame anditscorrespondingoperatorsandfunctions
10. ImplementationofReadingdatafromthefilesandwritingoutputbacktothespecifiedfile
11. TreatmentofNAs,outliers,Scalingthedata,etc
12. Applyingsummary()tofindthemean,median,standarddeviation,etc
13. ImplementationofVisualizations -Bar,Histogram, Box,Line,scatterplot,etc.
14. ImplementationofLinearandmultipleLinearRegression
15. Fittingregressionline

VIII Semester

Course21A:BigDataTechnologies

Credits-3

LearningObjectives:

To provide students with a comprehensive understanding of Big Data technologies, including ApacheHadoop, Hive, HBase, and Zookeeper, and develop practical skills in data processing, querying, andanalyticsfor large-scaledatasets.

LearningOutcomes: Uponsuccessfulcompletion ofthecourse,studentswill beableto:

1. Understandtheimportanceandchallengesof BigData,includingitsclassificationandapplications.
2. FamiliarizewithApache Hadoopandlearndatamovementand MapReducealgorithms.
3. ExploreHadooparchitecture, includingHDFS,MapReducetasks,andclustersetup.
4. Developskillsin HiveandHiveQLforqueryingandanalyzingdata inHadoop.
5. GainproficiencyinHBase,includingschemadesign,advancedindexing,andworkingwithZookeepe rfor cluster monitoring.

UNIT-I

INTRODUCTION TO BIG DATA: Introduction – Classification of digital data: Structured, Semistructured and unstructured data, Big Data and its importance, Four V's in Big data, Driversfor Bigdata,ChallengesofBig data, Big data analyticsand Big dataapplications.

UNIT-II

INTRODUCTION HADOOP: Big Data – Apache Hadoop & Hadoop Ecosystem – Moving Datainand out of Hadoop – Understanding inputs and outputs of MapReduce - Algorithms using mapreduce,Matrix-VectorMultiplicationby Map Reduce,DataSerialization.

UNIT-III

HADOOPARCHITECTURE: HadoopArchitecture,HadoopStorage:HDFS,CommonHadoopShellco mmands,AnatomyofFileWriteandRead.,NameNode,SecondaryNameNode,and

DataNode,HadoopMapReduceparadigm,MapandReducetasks,Job,TaskTrackers-ClusterSetup –SSH&HadoopConfiguration –HDFSAdministering–Monitoring&Maintenance.

UNIT-IV

HIVEANDHIVEQL: HiveArchitectureandInstallation,ComparisonwithTraditionalDatabase,HiveQL-QueryingData-Sortingand Aggregating, MapReduceScripts, Joins&Subqueries

UNIT-V

HBaseconcepts-AdvancedUsage,SchemaDesign,AdvanceIndexing-Zookeeper-howithelpsinmonitoringacluster, HBaseuses Zookeeper and howto BuildApplications withZookeeper.

TextBooks:

1. BigDataBlackBook(CoversHadoop2,MapReduce,Hive,Yarn,Pig&DataVisualization)-Dream Tech Publications
2. BigdataandAnalytics-SeemaAcharyaandSubhashiniChellappan-Wileypublications.

ReferenceBooks:

1. "UnderstandingBigdata",ChrisEaton,Dirkderoosetal.,McGrawHill,2012.
2. "BigData Analytics",G.SudhaSadasivamandR.Thirumahal,OxfordUniversityPress2020.
3. "HADOOP:ThedefinitiveGuide",TomWhite, OReilly 2012.
4. "BigDataAnalyticswithRandHaoop",VigneshPrajapati,PacketPublishing2013.
5. "OracleBigDataHandbook",TomPlunkett,BrianMacdonaldetal,OraclePress,2014.

SUGGESTEDCO-CURRICULARACTIVITIES:

1. ArrangeexpertlecturesbyITexpertsworkingprofessionallyintheareaofBig data
2. Assignments
3. Seminars,Groupdiscussions, Quiz,Debatesetc.
4. Presentationbystudentsonvariousapplications ofBig data.
5. Problemsolvingexercises.

VIIISemester

Course21A:BigDataTechnologies

Credits-1

ListofExperiments:

1. HDFS:Setupahdfsinasinglenodetomultinodecluster,performbasicfilesystemoperationon itusing commands provided, monitorcluster performance
2. WritevariousMapReduceprogramstocountthenumberoftimesasinglewordhasoccurredin agiven paragraph.
3. Implementthefollowingfilemanagementtasksin Hadoop:
    a. Addingfilesanddirectories,Listthefilesanddirectories
    b. Retrievingfiles Deletingfiles
    c. CopyingfilesfromonefoldertoanotherinHDFS
    d. CopyingfilesfromLocalFileSystemtoHDFS
4. WriteaMap Reduceprogram toadd twomatrices.
5. WriteaMapReduceprogramtomultiplyamatrixwithaVector.
6. RunabasicWordCountMapReduceprogram tounderstandMapReduce Paradigm
7. WriteaMapReduceprogramthatminesweatherdata(NCDC).Weathersensorscollectingdataevery houratmanylocationsacrosstheglobegatheralargevolumeoflogdata,whichisagoodcandidate for analysis with MapReduce, since it is semi structured and record- oriented. (Dataavailableat: ftp://ftp.ncdc.noaa.gov/pub/data/noaa/.)
8. Findaverage,maxandmintemperature foreachyearinNCDCdataset
9. Stopwordeliminationproblem:

    Input:1. Alargetextualfilecontaining onesentenceper line

    2.Asmallfilecontainingasetofstopwords(Onestopwordperline)**Output**:

    1.A textualfilecontainingthe same sentencesof the large inputfilewithoutthe wordsappearingin thesmall file.
10. WriteaMapReduceApplicationtoimplementCombiners
11. WriteaMapReduceApplicationtoimplementReduce-sideJoin
12. WriteaMapReduceApplicationtoimplement Map-sideJoin
13. Hbase: Setup of Hbase in single node and distributed mode, write program to write somedataintohbaseand queryit

VIII
SemesterCourse21B:Compiler Design

LearningObjectives:

Toprovidestudentswithacomprehensiveunderstandingofcompilerdesignprinciplesandtechniques, including lexical analysis, syntax analysis, intermediate code generation, error handling,storageorganization, code generation, and optimization..

LearningOutcomes: Uponsuccessfulcompletion ofthecourse,studentswill beableto:

1. Understandthecompilerstructureandtheprocessoflexicalanalysisusingfiniteautomata.
2. Acquireknowledgeofsyntaxanalysistechniques,includingrecursivedescentparsing,predictivepar sing, and LR parsing.
3. Learnaboutsyntax-directedtranslation,intermediatecodegeneration,anderrordetectionandrecoverymethods incompilers.
4. Explorestorageorganization,dynamicstorageallocation,errorrecoverymethods,andcodegenerati onissues incompilers.
5. Develop an understanding of code optimization techniques, machine-dependentoptimization,registerallocation,andmachine-independentoptimizationincompilers.

UNIT-I

OverviewoftheCompileranditsStructure: Languageprocessor,Applicationsoflanguageprocessors, Definition-Structure-Working of compiler, the science of building compilers, Differencebetweeninterpreterandcompiler.Compilationofsourcecodeintotargetlanguage,Typesofcompi lers

LexicalAnalysis: TheRoleoftheLexicalAnalyzer,SpecificationofTokens,RecognitionofTokens, Input Buffering, elementary scanner design and its implementation (Lex), Applying conceptsofFiniteAutomataforrecognitionof tokens.

UNIT-II

SyntaxAnalysis: UnderstandingParserandCFG(ContextFreeGrammars),RoleofParser,ParseTree -EliminationofAmbiguity,LeftRecursionandLeftFactoring ofgrammar

VIII

SemesterCourse21B:Compiler Design

SyntaxAnalysis-TopDown: TopDownParsing-RecursiveDescentParsing-NonRecursive DescentParsing-PredictiveParsing-LL(1)Grammars.

Syntax Analysis-BottomUp: ShiftReduceParsers-OperatorPrecedenceParsing-LRParsers,ConstructionofSLR ParserTables andParsing, CLRParsing, LALRParsing

UNIT-III

SyntaxDirectedDefinition–EvaluationOrder-ApplicationsofSyntaxDirectedTranslation-Syntax Directed Translation Schemes - Implementation of L attributed Syntax Directed Definition.**IntermediateCodeGeneration:**VariantsofSyntaxtrees-ThreeAddressCode-Types– Declarations - Procedures- Assignment Statements- Translation ofExpressions- ControlFlow-BackPatching-SwitchCaseStatements.

UNIT-IV

Error Recovery Error Detection & Recovery, Ad-Hoc and Systematic Methods Source LanguageIssues, Storage Organization. Stack Allocation of Space, Access to Nonlocal Data on the Stack,Parameter Passing; Symbol Tables; Language Facilities for Dynamic Storage Allocation; DynamicStorageAllocationTechniques,Heap Management

UNIT-V

Code Generation: Issues in the Design of a Code Generator, the Target Language, Addressesin theTargetCode, Basic Blocks and Flow Graphs,

Code Optimization: Optimization of Basic Blocks, A Simple Code Generator, Machine dependentoptimization,RegisterAllocationandAssignment;TheDAGRepresentationofBasicBlocks;PeepholeOptimization;GeneratingCodefromDAGs;Designofspecificationsforcompilers,MachineindependentoptimizationErrordetectionofrecovery

TextBooks:

1. A.V.Aho,MonicaS.Lam,RaviSethiandJeffreyD.Ullman,Compilers:Principles,techniques,&tools, Second Edition, Pearson Education, 2007.
2. K.D.CooperandL.Torczon,Engineeringacompiler,MorganKaufmann,2ndedition,2011.

3. StevenS.Muchnick,AdvancedCompilerdesignimplementation”ElsevierScienceIndia,2003.
4. CompilerDesignbyMuneeswaran,OxfordUniversityPress

ReferenceBooks:

1. Andrew A.Appel , Modern Compiler Implementation in Java, Cambridge University Press;2ndedition, 2002.
2. AllenHolub,CompilerDesigninC,PrenticeHall,1990
3. TorbengidiusMogensen, Basics ofCompilerDesign,Springer,2011.
4. Charles N, Ron K Cytron, Richard J LeBlanc Jr., Crafting a Complier, Pearson Education,2010.

SUGGESTEDCO-CURRICULARACTIVITIES:

1. Trainingofstudents byrelatedindustrialexperts.
2. Assignments
3. Seminars,Groupdiscussions, Quiz,Debatesetc.(onrelatedtopics).
4. Presentationbystudentson OnlineCompilersanditsArchitecture
5. Implement the back end of the compiler which takes the three-address code and produces the8086 assembly language instructions that can be assembled and run using an 8086 assembler.Thetarget assembly instructionscan besimple move, add, sub,jump etc.

VIII
SemesterCourse21B:Compiler Design

Credits-1

ListofExperiments:

1. ImplementationofaLexicalAnalyzerusingtoolslikeFlexorLextorecognizeandtokenizeinput programs.
2. BuildingaSyntaxAnalyzerusingaparsergeneratorlikeBisonorYACCtoverifythesyntacticalcorrectness ofthe input program.

3. Write a LEX program to recognize valid arithmetic expression. Identifiers in the expressioncould be only integers and operators could be + and *. Count the identifiers & operatorspresentand print them separately.
4. Write a LEX program to eliminate comment lines in a C program and copy the resultingprograminto aseparatefile
5. WriteYACCprogramtorecognizeallstringsforwhichstartswith‘n’numberof‘a’sfollowedby n numberof‘b’s.
6. Write YACC program to recognize valid identifier, operators and keywords in the given text(Cprogram) file.
7. ImplementationofcalculatorusinglexandYACC.
8. WriteaCProgramtodevelopan operatorprecedenceparser foragivenlanguage.
9. ConverttheBNFrulesintoYACCformandwritecodetogenerateabstractsyntaxtree.
10. Constructarecursivedescent parserforanexpression.
11. ConstructaShift Reduce Parserforagivenlanguage.
12. Implement Intermediatecodegenerationforsimpleexpressions

VIIISemester

Course22A:DataMiningConceptsandTechniques

Credits-3

LearningObjectives:

To provide students with a thorough understanding of data warehousing and data mining concepts,techniques,and applications.

LearningOutcomes: Uponsuccessfulcompletion ofthecourse,studentswill beableto:

1. Understand data warehousing concepts, including data warehouse architecture,multidimensionaldatamodels, and OLAP operations.
2. Explorethefundamentalsofdatamining,includingitsdefinition,techniques,andapplicationsinreal-world scenarios.
3. Developknowledgeandskillsinclusteringtechniques,includingpartitioningalgorithms,hierarchicalclustering,and categorical clustering.
4. Acquireproficiencyindecisiontreeconstructionandtheuseofdecisiontreealgorithmsfordataanalysis and prediction.
5. Gainexposuretovariousadvanceddataminingtechniques,suchasneuralnetworks,geneticalgorithms, and textmining, includingweb miningconcepts andapplications.

UNIT-I

DataWarehousing:Introduction,WhatisDataWarehouse?Definition,MultidimensionalDataModel, **OLAP** Operations, Warehouse Schema, Data Warehouse Architecture, Warehouse Server,Metadata,OLAP Engine,DataWarehouseBackend Process,OtherFeatures DataPre-processing,DescriptiveDataSummarization,DataCleaning,DataIntegrationandTransformation,DataReduction, DataDiscretizationandConceptHierarchyGeneration

UNIT-II

Data Mining:Whatis Data Mining? DataMining:Definitions,KDD vsData Mining, DBMS vsDM, Other Related Areas, DM Techniques, Other Mining Techniques, Issues and Challenges in DM,DMApplications-CaseStudies

Association Rules: What is an Association Rule? Methods to Discover Association Rules, A PrioriAlgorithm,PartitionAlgorithm,Pincer-

SearchAlgorithm,DynamicItemsetCountingAlgorithms,FP-TreeGrowthAlgorithm,DiscussiononDifferentAlgorithms,IncrementalAlgorithms,BorderAlgorithms, GeneralizedAssociation Rule,AssociationRules withItemConstraints

UNIT-III

ClusteringTechniques:ClusteringParadigms,PartitioningAlgorithms,k-MedoidAlgorithms,CLARA, CLARANS, Hierarchical Clustering, DBSCAN, BIRCH, CURE, Categorical ClusteringAlgorithms, STIRR, ROCK, CACTUS

UNIT– IV

Decision Trees: What is a Decision Tree? Tree Construction Principle, Best Split, Splitting Indices,SplittingCriteria,DecisionTreeConstructionAlgorithms,CART,ID3,C4.5,DecisionTreeConstructionwithPresorting,Rainforest,ApproximateMethods,CLOUDS,BOAT,PruningTechniques,IntegrationofPruning andConstruction, IdealAlgorithm

UNIT– V

OtherTechniques: WhatisaNeuralNetwork?LearninginNN,UnsupervisedLeaning,DataMining Using NN: A Case Study, Genetic Algorithms, Rough Sets, Support Vector Machines **WebMining:**WebMining,WebContentMining,WebStructure Mining,WebUsage Mining,TextMining,UnstructuredText,EpisodeRuleDiscoveryforTexts,HierarchyofCategories,TextClustering

TextBooks:

1. DataMiningTechniques, ArunKPujari,UniversityPress
2. DataMining:Concepts andTechniques,3rdEdition,JiaweiHan,MichelineKamber,JianPei

SUGGESTEDCO-CURRICULARACTIVITIES:

1. ArrangeexpertlecturesbyITexpertsworkingprofessionallyintheareaofBig data
2. Assignments
3. Seminars,Groupdiscussions, Quiz,Debatesetc.
4. Presentationbystudentsonvariousapplications ofDataMining.
5. Problemsolvingexercises.

VIIISemester

Course22A:DataMiningConceptsandTechniques

Credits-1

ListofExperiments:

1. StudyofvariousOpen-SourceDataMiningTools
2. BuildDataWarehouseandExploreWEKA
3. PerformdatapreprocessingtasksandDemonstrate
4. Performassociation ruleminingon datasets
5. Demonstrateperforming classification ondatasets
6. Demonstrateperformingclusteringondatasets
7. Demonstrateperforming Regressionondata sets
8. CreditRiskAssessment.SampleProgramsusingGermanCreditData
9. SamplePrograms usingHospitalManagementSystem

VIIISemesterCourse

22B:DigitalImageProcessing

Credits-3

LearningObjectives:

Toprovidestudentswithacomprehensiveunderstandingofdigitalimageprocessingconcepts,techniques,and applications.

LearningOutcomes: Uponsuccessfulcompletion ofthecourse,studentswill beableto:

1. Understanddigital imageprocessingfundamentalsandapplicationsinvariousdomains.
2. Developskills inspatialdomainimageenhancementtechniques
3. Acquireproficiencyinfrequencydomainimageenhancement
4. Masterinimagesegmentation techniques
5. Learnimagecompressionprinciples.

UNIT-I

Introduction: Fundamental Steps in Digital Image Processing, Components of an Image ProcessingSystem,Samplingand Quantization,RepresentingDigitalImages(Datastructure),SomeBasicRelationships betweenPixels-NeighborsandConnectivityofpixelsinimage, Applications ofImageProcessing:Medicalimaging,Robotvision,Characterrecognition,RemoteSensing.

UNIT-II

Image Enhancement in The Spatial Domain: Some Basic Gray Level Transformations, HistogramProcessing, Enhancement Using Arithmetic/Logic Operations, Basics of Spatial Filtering, SmoothingSpatialFilters, Sharpening Spatial Filters,Combining Spatial EnhancementMethods.

UNIT-III

Image Enhancement inFrequency Domain: Introduction, Fourier Transform, DiscreteFourierTransform (DFT), properties of DFT, Discrete Cosine Transform (DCT), Image filtering in frequencydomain.

UNIT-IV

Image Segmentation: Introduction, Detection of isolated points, line detection, Edge detection, Edgelinking, Region based segmentation- Region growing, split and merge technique, local processing,regionalprocessing, Houghtransform, Segmentationusing Threshold.

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UNIT -V

Image Compression: Introduction, coding Redundancy, Inter-pixel redundancy, image compressionmodel,LossyandLosslesscompression,HuffmanCoding,ArithmeticCoding,LZW coding,Transform Coding, Sub-image size selection, blocking, DCT implementation using FFT, Run lengthcoding.

TextBooks:

1. R.C.GonzalezandR.E.Woods,Digital ImageProcessing,3rdedition, PrenticeHall,2008.
2. Jayaraman,S.Esakkirajan,andT.Veerakumar,"DigitalImageProcessing",TataMcGraw-HillEducation,2011.

ReferenceBooks:

1. AnilK.Jain,"FundamentalsofDigitalImageProcessing",PrenticeHallofIndia,9thEdition,Indian Reprint,2002.
2. B.Chanda,D.DuttaMajumder,"Digital ImageProcessingandAnalysis",PHI,2009.

SUGGESTEDCO-CURRICULARACTIVITIES:

1. Arrangeexpertlecturesintheareaof ImageProcessing.
2. Assignments related to medical image processing, character recognition, signaturerecognition,remotesensing imageprocessing, etc.
3. Seminars,Groupdiscussions, Quiz,Debatesetc.(onrelatedtopics).
4. Presentationbystudentsonrecenttrendsof Image processing.

VIIISemester
Course22B:DigitalImageProcessing
Credits-1

ListofExperiments:

1. SimulationandDisplayofan Image,NegativeofanImage(Binary&GrayScale)
2. ImplementationofRelationshipsbetweenPixels.
3. ImplementationofTransformationsofanImage
4. Contraststretchingofalowcontrastimage,Histogram,andHistogramEqualization
5. Displayofbitplanesofan Image
6. DisplayofFFT(1-D&2-D)ofanimage
7. ComputationofMean,StandardDeviation,CorrelationcoefficientofthegivenImage
8. ImplementationofImage SmootheningFilters(MeanandMedianfilteringofan Image)
9. Implementationofimage sharpeningfiltersandEdgeDetectionusingGradientFilters
10. ImageCompressionbyDCT,DPCM,HUFFMANcoding
11. Implementationofimagerestoringtechniques
12. Implementationof Image Intensityslicingtechniqueforimageenhancement
13. CannyedgedetectionAlgorithm.

VIIISemester
Course23A:InformationSecurityandCryptography

Credits-3

LearningObjectives:

To provide studentswithacomprehensiveunderstandingofcryptographyandnetwork securityconceptsand theirpractical applications.

LearningOutcomes: Uponsuccessfulcompletion ofthecourse,studentswill beableto:

1. Demonstratetheknowledgeofcryptography,networksecurityconceptsandapplications.
2. Developsecuritymechanismstoprotectcomputersystems andnetworks.
3. Applysecurityprinciplesinsystemdesign.
4. Applymethodsforauthentication,access control,intrusiondetectionandprevention.
5. Abilitytoidentifyandinvestigatevulnerabilitiesandsecuritythreatsandmechanismstocounterthem .

UNIT-I

Information Security: Introduction, History of Information security, What is Security, CIA Traid,CNSS Security Model, Components of Information System, Balancing Information Security andAccess, Approaches to Information Security Implementation, The Security Systems DevelopmentLifeCycle.

Security Attacks (Interruption, Interception, Modification and Fabrication), Vulnerability, SecurityServices (Confidentiality, Authentication, Integrity, Non-repudiation, access Control andAvailability)andMechanisms.

UNIT-II

Cryptography: Concepts and Techniques, Conventional substitution and transposition ciphers, One-timePad,BlockcipherandStreamCipher,SymmetricandAsymmetrickeycryptography,Steganography

Symmetric key Ciphers: DES structure, DES Analysis, Security of DES, variants of DES, Blockciphermodes ofoperation, AESstructure, Analysis of AES,Keydistribution.

UNIT-III

Asymmetric key Ciphers: Principles of public key cryptosystems, RSA algorithm, Analysis of RSA,Diffie-HellmanKey exchange, EllipticCurveCryptography.

MessageauthenticationandHashFunctions,AuthenticationRequirementsandFunctions,Message Authentication, Hash Functions and MACs Hash and MAC Algorithms SHA-512, HMAC.DigitalSignatures, Authentication Protocols,DigitalsignatureStandard.

UNIT-IV

ProgramSecurity:Secureprograms,Non-maliciousProgramerrors,Maliciouscodesvirus,Trapdoors,Salami attacks, Covert channels, Control againstprogram.

IPSecurity: Overview,IPSecurityArchitecture,AuthenticationHeader,EncapsulatingSecurityPayload,Combining Security Associations and Key Management.

EmailSecurity: PrettyGoodPrivacy(PGP)andS/MIME.

UNIT-V

Web Security: Web Security Requirements, Secure Socket Layer (SSL) and Transport LayerSecurity(TLS),SecureElectronicTransaction (SET).

Intruders,VirusandFirewalls:Intruders,Intrusiondetection,passwordmanagement,Virusandrelatedthreats,Countermeasures,Firewall design principles, Types offirewalls

WirelessSecurity,Honeypots, Trafficflowsecurity.

TextBook(s)

1. **Principles of Information Security**: *Michael E. Whitman, Herbert J. Mattord*,CENGAGELearning, 4th Edition.
2. **CryptographyAndNetworkSecurityPrinciplesAndPractice**,FourthorFifthEdition, *WilliamStallings*,Pearson
3. **SecurityinComputing**,FourthEdition,by*CharlesP.Pfleeger*,PearsonEducation

ReferenceBooks

1. **ModernCryptography**:**TheoryandPractice**,by*WenboMao*,PrenticeHall.
2. **NetworkSecurityEssentials**:**ApplicationsandStandards**,by*WilliamStallings*.PrenticeHall.
3. **PrinciplesofInformation Security**,*Whitman*,Thomson.
4. **CryptographyandNetworkSecurity**:*ForouzanMukhopadhyay*,McGrawHill,2ndEdition

SUGGESTEDCO-CURRICULARACTIVITIES:

1. Trainingofstudentsby relatedindustrialexperts.
2. Assignments
3. Seminars,Groupdiscussions, Quiz,Debatesetc.(onrelatedtopics).
4. PresentationbystudentsonemergingCyberfrauds
5. CaseStudiesofVariousCryptographicAlgorithms

VIIISemester

Course23A:InformationSecurityandCryptography

Credits-1

ListofExperiments:

1. WriteaJavaProgram toimplement CeaserCipher
2. WriteaJavaProgramtoimplementPlayfairCipher
3. WriteaJavaProgramtoimplementRailfenceCipher
4. WriteaJavaProgram toimplementHill Cipherwith 2x2Matrix
5. WriteaJavaProgram to implementDES algorithm
6. WriteaJavaProgramtoimplementRSAalgorithm
7. WriteaJavaProgram forDiffie-HellmanKeyExchange
8. WriteaJavaProgram toGenerateSHA-512Hashofafile
9. WriteaJavaProgram toimplement DigitalSignaturewith aFile
10. ConfiguringS/MIMEforemailcommunication
11. Setupahoneypotand monitor thehoneypot onthenetwork
12. Demonstratehowtoprovidesecuredatastorage,securedatatransmissionandforcreatingdigitalsignatures (GnuPG)
13. PerformwirelessauditonanaccesspointorarouteranddecryptWEPandWPA(NetStumbler)
14. Demonstrateintrusiondetectionsystem (ids)using anytool (snortoranyothers/w)

VIIISemester

Course23B:MobileAdhocandSensorNetworks

Credits-3

LearningObjectives:

To provide students with a comprehensive understanding of ad hoc wireless networks, including theirfundamentals,protocols,and security mechanisms.

LearningOutcomes: Uponsuccessfulcompletion ofthecourse,studentswill beableto:

1. Understandtheconceptofad-hocandsensornetworks,theirapplicationsandtypicalnodeandnetworkarchitectures.
2. DescribetheMACprotocol issuesofadhoc networks.
3. IdentifyanddescriberoutingprotocolsforadhocwirelessnetworkswithrespecttoTCPdesign issues.
4. Explaintheconcepts ofnetworkarchitectureandMAClayerprotocolforWSN.
5. FamiliarwiththeOSusedinWirelessSensorNetworksandbuildbasicmodules.

UNIT-I

IntroductiontoAdHocWirelessNetworks: FundamentalsofWirelessCommunicationTechnology, The Electromagnetic Spectrum, Radio propagation Mechanisms, Characteristics of theWirelesschannel,CellularandAdHocWirelessNetworks,CharacteristicsofMANETs,Applicationsof MANETs, IssuesandChallengesofMANETs,Ad HocWirelessInternet

UNIT-II

MAC Protocols for Ad Hoc Wireless Networks: Introduction, Issues in Designing a MAC protocolfor Ad Hoc Wireless Networks, Design goals of a MAC Protocol for Ad Hoc Wireless Networks,Classifications of MAC Protocols, Contention - Based Protocols, Contention - Based Protocols withreservation Mechanisms, Contention – Based MAC Protocols with Scheduling Mechanisms, MACProtocols that useDirectionalAntennas,OtherMAC Protocols.

UNIT-III

RoutingProtocolsforAdHocWirelessNetworks: IssuesinDesigningaRoutingProtocol,Classifications of Routing Protocols-Table driven protocols- Destination Sequenced Distance Vector(DSDV),WirelessRoutingProtocol(WRP),On-demandroutingprotocol-DynamicSourceRouting

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(DSR),AdHocOn-DemandDistanceVectorRouting(AODV),Hybridroutingprotocols-ZoneRoutingProtocol (ZRP)

UNIT-IV

Transport layer and Security Protocols for Ad hoc Wireless Networks: Introduction, issues inDesigning a Transport Layer Protocol for Ad Hoc Wireless Networks. Classification of TransportLayer Solutions. TCP Over Ad Hoc Wireless Networks, Other Transport Layer Protocol for Ad HocWirelessNetworks.

Security protocols: Security in Ad hoc Wireless Networks, Network Security Requirements, IssuesandChallengesinSecurityProvisioning,NetworkSecurityAttacks,KeyManagement,SecureRoutinginAdhocWirelessNetworks,Cooperation inMANETs, Intrusion DetectionSystems.

UNIT-V

Basics of Wireless Sensors and Applications: The Mica Mote, Sensing and Communication Range,Design Issues, Energy Consumption, Clustering of Sensors, Applications, Data Retrieval in SensorNetworks-ClassificationofWSNs,MAClayer,Routinglayer,Transportlayer,High-levelapplicationlayersupport,Hardware-ComponentsofSensorMote,SensorNetworkOperatingSystems–TinyOS, CONTIKIOS, Node-level Simulators – NS2 and its extension to sensor networks, COOJA,TOSSIM

TextBook(s)

1. *C.SivaRamMurthyandB.S.Manoj*,"**AdHocWirelessNetworksArchitecturesandProtocols**",Prentice Hall, PTR, 2004.
2. *Holger Karl, Andreas willig*, *"***Protocol and Architecture for Wireless SensorNetworks***"*,John Wiley publication, Jan 2006.

ReferenceBooks

1. *FengZhao,LeonidasGuibas*,**"WirelessSensorNetworks:aninformationprocessingapproach"**,Elsevier publication, 2004.
2. *CharlesE.Perkins*,"**AdHocNetworking**",AddisonWesley,2000.
3. I*.F.Akyildiz,W.Su,Sankarasubramaniam,E.Cayirci*,**"Wirelesssensornetworks:asurvey, computer networks"**, Elsevier, 2002, 394 -422.

SUGGESTEDCO-CURRICULARACTIVITIES:

1. Trainingofstudentsby relatedindustrialexperts.
2. Assignments
3. Seminars,Groupdiscussions, Quiz,Debatesetc.(onrelatedtopics).
4. PresentationbystudentsonvariousNetworkSimulators
5. CaseStudiesofVariousApplicationsofAdhocandSensorNetworks

VIIISemester

Course23B:MobileAdhocandSensorNetworks

Credits-1

ListofExperiments:

All the experiments should be done on any Network Simulator like NS-2/NS-2/OMNET++/OPNET etc.

1. StudyvariousnetworksimulatorsusedforwirelessAd-HocandSensorNetworks.
2. IntroductiontoTCLscripting:demonstrationofonesmallWirelessnetworksimulationscript.
3. Studyvarioustracefile formats ofnetworksimulators.
4. Implement andcomparevariousMAClayerprotocols.
5. GenerateTCLscriptforUDPandCBRtrafficinWSNnodes.
6. GenerateTCLscriptforTCP andCBRtrafficinWSNnodes.
7. ImplementandcompareAODVandDSRroutingalgorithmsinMANETforvariousparameters.
8. ImplementDSDVroutingalgorithms inMANET.
9. Calculateandcompareaveragethroughputforvarious TCP variants.
10. Implement andcomparevarious routingprotocols forwirelesssensornetworks.
11. StudyEthereal/Wiresharksoftwareandanalyzedumpfiles.

VIIISemester

SkillbasedCourse24A:AdvancedDatabaseManagementSystems

Credits-3

LearningObjectives:

To provide students with a Through theoretical knowledge and practical application of advancedtopicsin databasemanagement systems.,

LearningOutcomes: Uponsuccessfulcompletion ofthecourse,studentswill beableto:

1. Gain understanding of relational database concepts, functional dependencies, andcorrectnessofFDs.
2. Analyzeandapply normalizationtechniques(3NF,BCNF,4NF,5NF)
3. Developskillsinprocessingjoins,graspmaterializedvs.pipelinedprocessing
4. Learnprinciplesofcorrectinterleavedexecution,lockingmechanisms(2PL),handledeadlocks.
5. AcquireknowledgeofT/O-basedtechniques,multi-versionapproaches

UNIT-I

Formalreviewofrelationaldatabaseconcepts,Functionaldependencies,Closure,CorrectnessofFDs

UNIT-II

3NF and BCNF, 4NF and 5NF, Decomposition and synthesis approaches, Review of SQL99, Basicsofquery processing, externalsorting, filescans

UNIT-III

Processingofjoins,materializedvs.pipelinedprocessing,querytransformationrules,DBtransactions,ACI Dproperties, interleavedexecutions, schedules,serializability

UNIT-IV

Correctness of interleaved execution, Locking and management of locks, 2PL, deadlocks, multiplelevel granularity, Concurrency Control on B+ trees, Optimistic Concurrency Control and the conceptsrelatedto Global andLocal transactionsin Distributed transactions.

UNIT-V

T/Obasedtechniques,Multiversionapproaches,ComparisonofConcurrencyControlmethods,dynamicdatabases, Failureclassification, recovery algorithm, XMLand relationaldatabases

TextBook(s)

1. R.Ramakrishnan,J.Gehrke,DatabaseManagementSystems, McGrawHill,2004
2. A.Silberschatz,H.Korth,S.Sudarshan,Databasesystemconcepts,5/e,McGrawHill,2008.

ReferenceBooks

3. HectorGarcia-Molina,JeffUllman,andJenniferWidom,"DatabaseSystems:TheCompleteBook",Pearson, 2011.

SUGGESTEDCO-CURRICULARACTIVITIES:

1. Performancetuningapproachesbysubjectmatterexperts
2. Assignments
3. Seminars,Groupdiscussions,Quiz,Debatesetc.(onrelatedtopics).
4. CreatingdifferentkindsofindexesinOracleandMySQLdatabasesandcomparetheperformance
5. Casestudyontheneedfor2PLandtransactionalcontrols

VIIISemester

SkillbasedCourse24A:AdvancedDatabaseManagementSystems

Credits-1

ListofExperiments:

1. RunningBasicSQLcommands
2. UnderstandingtheuseofIntermediateSQL
3. RunningAdvancedSQLrelatedtodatamining(Slicing andDicing)
4. CreationofERandEERdiagramsforanorganization
5. DatabaseDesignandNormalizationforagivenorganization

6. AccessingDatabasesfromProgramsusingJDBC
7. Analyzingqueryperformanceusingexplainplans
8. Creationofindexesforbetterqueryperformance.
9. Runningdifferentquery evaluationplans
10. ExperimentingonDBMSlocksandsessionmanagement

VIIISemester

Skillbased Course24B:CloudComputing

Credits-3

LearningObjectives:

Toprovidestudentswithacomprehensiveunderstandingofcloudcomputingconcepts,virtualizationtechnologies, and differentservicemodelsin thecontext of cloud computing.

The course will explore the origins, components, and essential characteristics of cloud computing,alongwith thebenefits and limitations associated with itsadoption

LearningOutcomes: Uponsuccessfulcompletion ofthecourse,studentswill beableto:

1. Understandthe essentialcharacteristicsandbenefitsofcloudcomputing
2. Gainknowledgeofvirtualizationtechnologies
3. Explore Microsoft implementation of virtualization and understand different clouddeploymentmodels and theiradvantages.
4. Learnabout InfrastructureasaService(IaaS)andPlatformasaService(PaaS)models,
5. ExploreSoftwareasaService(SaaS)anditsserviceproviders.

UNIT-I

CloudComputingOverview–OriginsofCloudcomputing–Cloudcomponents-Essentialcharacteristics–On-demandself-service,Broadnetworkaccess,Locationindependentresourcepooling,Rapidelasticity,Measuredservice.**Cloudscenarios**–Benefits:scalability,simplicity,vendors,security.Limitations–Sensitiveinformation-Applicationdevelopment–**Securityconcerns** - privacy concern with a third party- security level of third party - security benefitsRegularityissues:Government policies.

UNIT-II

Virtualization:Virtualizationandcloudcomputing-Needofvirtualization – cost,administration,fastdeployment,reduceinfrastructurecost-limitations

Types of hardware virtualization: Full virtualization - partial virtualization - para virtualizationDesktop virtualization: **Software virtualization** – Memory virtualization - Storage virtualization,**Datavirtualization**– **Networkvirtualization**

UNIT-III

Microsoft Implementation: Microsoft Hyper V, VMware features and infrastructure – Virtual Box - Thinclient

Cloud deployment model: Public clouds – Private clouds – Community clouds - Hybrid clouds - AdvantagesofCloud computing

UNIT-IV

Infrastructure as a Service (IaaS): IaaS service providers – Amazon EC2, GoGrid, Rack Space,WindowsAzureinfrastructureservices–AmazonECservicelevelagreement–Recentdevelopments – Benefits

Platform as a Service (PaaS): PaaS service providers – Right Scale – Salesforce.com – Force.com – OracleAPEX cloud -Services andBenefits

UNIT-V

Software as a Service (SaaS): SaaS service providers – Google App Engine, Salesforce.com andgoogleplatform–Benefits– Operationalbenefits-Economicbenefits– Evaluating SaaS

TextBook(s)

1.MasteringCloudComputing,FoundationsandApplicationProgramming,RajKumarBuyya,Christen vecctiola, S Tammaraiselvi, TMH

ReferenceBooks

1. Cloudcomputingapracticalapproach-AnthonyT.Velte,TobyJ.VelteRobertElsenpeterTATAMcGraw-Hill , New Delhi-2010
2. CloudComputing:Web-BasedApplicationsThatChangetheWayYouWorkandCollaborateOnline -Michael Miller -Que2008
3. CloudComputing,TheoryandPractice,DanC Marinescu,MKElsevier.
4. CloudComputing,AHandsonapproach,ArshadeepBahga,VijayMadisetti,UniversityPress
5. AWS,AzureandSaleforcewebtutorials

SUGGESTEDCO-CURRICULARACTIVITIES:

1. Trainingofstudentsby SkillDevelopmentCentres
2. Hands-onLabSessions onOpenPublicClouds
3. Assignments,Seminars,Groupdiscussions,Quiz,Debatesetc.(onrelatedtopics).
4. CaseStudiesonoperationsthatcanbeperformed onIaaS,PaaSandSaaSproviders

VIIISemester

Skillbased Course24B:CloudComputing

Credits-1

ListofExperiments:

1. Setupvirtualmachinesonasinglecomputerusing VMWareandVirtualBox
2. Createanetworkusingmultiplevirtualmachinesonasinglehostusing VMware
3. Setupaclientserverinteraction onasinglehost usingVMware
4. CreateanAWS accountandcreateanEC2instancewithaCcompiler
5. ConnecttoEC2instanceandrun someCprograms onEC2instance
6. InstallawebserveronanEC2instanceandprovideaccesstoitusingSecurityGrouprules
7. Createavirtual cloudonEC2platform
8. ConnecttoForce.comandcreateadataentryform usingSalesforceAPEX
9. Createanewaccount onSaleforce.com andcreate leads,quotesandcontracts
10. Analyzetheservices availableonOracleAPEXandcreatesamplewebapplications

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VIIISemester

Skill basedCourse25A:ComputerVision

Credits-3

LearningObjectives:

To equip the students with the knowledge and skills to analyze and interpret images, detect andrecognize objects, estimate motion, and apply computer vision techniques in various domains such asbiometrics,medical imageanalysis, surveillance, andaugmented reality.

LearningOutcomes: Uponsuccessfulcompletion ofthecourse,studentswill beableto:

1. Understandthefundamentalconceptsofcomputervisionanditsapplicationsinvariousdomains.
2. Applycolorandgeometrictransforms,edge-detectiontechniques,filtering,andmathematicaloperationsto analyzeimages.
3. Comprehendtheconceptofmotionestimationanditsapplications.
4. Applyshapecorrespondence,shapematching,principalcomponentanalysis,andshapepriorsforobject recognition.
5. Explorevarious applications ofcomputervision

UNIT-I

Introduction to Computer Vision: Image Processing, Computer Vision and Computer Graphics,Computer Vision Applications: Document Image Analysis, Biometrics, Object Recognition,Tracking,MedicalImageAnalysis,Content-BasedImageRetrieval,VideoDataProcessing,Multimedia,VirtualReality and Augmented Reality

UNIT-II

Image Representation And Analysis: Image representation, Image processing techniques like colorand geometric transforms, Edge-detection Techniques, Filtering, Mathematical operations on imageandits applications like convolution, filtering

UNIT-III

MotionEstimation: Introductiontomotion,Regularizationtheory,Opticalcomputation,StereoVision,Motion estimation, Structurefrom motionand models

UNIT-IV

ObjectRecognition: Houghtransformsandothersimpleobjectrecognitionmethods,Shapecorrespondence and shape matching, Principal component analysis, Shape priors for recognition**UNIT-V**

Applications: Photo album, Face detection, Face recognition, Eigen faces, Active appearance and3Dshape models of faces Application: Surveillance, foreground background separation, particle filters,Chamfer matching, tracking, and occlusion, combining views from multiple cameras, human gaitanalysis Application: Invehicle vision system: locating roadway, road markings, identifying roadsigns,locating pedestrians

TextBook(s)

1. ComputerVision-Amodernapproach,byD. Forsyth andJ.Ponce,PrenticeHall
2. RobotVision,byB. K.P.Horn,McGraw-Hill.
3. E.R.Davies,Computer&MachineVision,FourthEdition,AcademicPress, 2012

ReferenceBooks

1. IntroductoryTechniquesfor3DComputerVision,byE.TruccoandA.Verri,Publisher:PrenticeHall.
2. D.H.Ballard,C.M.Brown.ComputerVision.Prentice-Hall,Englewood Cliffs.
3. RichardSzeliski,ComputerVision:AlgorithmsandApplications(CVAA).Springer,2010
4. ImageProcessing, Analysis,andMachineVision.Sonka,Hlavac,andBoyle.Thomson.
5. SimonJ.D.Prince,ComputerVision:Models,Learning,andInference,CambridgeUniversityPress, 2012

SUGGESTEDCO-CURRICULARACTIVITIES:

1. StudentSeminaronApplicationsofComputerVision
2. Hands-onLabSessionsonComputerVisionTechniques
3. Assignments,Seminars,Groupdiscussions,Quiz,Debatesetc.(onrelatedtopics).
4. ProjectWork

VIIISemester

Skillbased Course25A:ComputerVisionwithOpenCV

Credits-1

ListofExperiments:

1. Importlibraries
2. RGBimageandresizing
3. Grayscaleimage
4. Imagedenoising, Imagethresholding, Imagegradients
5. Edgedetectionfouriertransform onimage
6. Linetransform
7. Cornerdetection
8. Morphologicaltransformation ofimage,Geometrictransformationofimage
9. Contours
10. Imagepyramids
11. Colorspaceconversionandobjecttracking
12. Interactiveforegroundextraction
13. Imagesegmentation, Imageinpainting
14. Templatematching
15. Faceandeyedetection

VIIISemester
SkillbasedCourse25B:DigitalForensics
Credits-3

LearningObjectives:

Toequipstudents withthe knowledgeandskillsnecessary toeffectivelyhandledigitalinvestigations,ensuringthepreservation,analysis,andpresentationofdigitalevidenceinalegallysound manner.

LearningOutcomes: Uponsuccessfulcompletion ofthecourse,studentswill beableto:

1. Gainaclearunderstanding ofthefundamentals ofdigitalforensics
2. Developknowledgeandskillsinanalyzingstoragemediaandfilesystems
3. Learnaboutnetworkforensicsandacquirepracticalskillsinnetworkpacketsniffing,analysisusing toolslikeWiresharkand TCPDUMP
4. Gainexpertiseinlogsandeventanalysis,datacarving
5. Developproficiencyinwirelessandwebattacks.

UNIT-I

Introduction to Digital Forensic: Definition of Computer Forensics, Cyber Crime, Evolution ofComputer Forensics, Objectives of Computer Forensics, Roles of Forensics Investigator, ForensicsReadiness,Steps for Forensics

Computer Forensics Investigation Process: Digital Forensics Investigation Process-AssessmentPhase,AcquiretheData,AnalyzetheData, Reportthe Investigation

Digital Evidence and First Responder Procedure: Digital Evidence, Digital Evidence InvestigationProcess.FirstRespondersToolkit,IssuesFacingComputerForensics,TypesofInvestigation,Techniquesin digital forensics

UNIT-II

Understanding Storage Media and File System: The Booting Process, LINUX Boot Process, MacOSBoot Sequence,Windows 10 BootingSequence,FileSystem, Typeof FileSystems.

Windows Forensics: Introduction to Windows Forensics, Windows Forensics Volatile Information,Windows Forensics Non- Volatile Information, Recovering deleted files and partitions, WindowsForensicsSummary.

VIIISemester

SkillbasedCourse25B:DigitalForensics

Credits-3

UsageofSlackspace,toolsforDiskImaging,DataRecovery,VulnerabilityAssessmentTools,Encase and FTK tools:**FTK Imager:**

DigitalForensicsRoadmap: StaticDataAcquisitionfromwindowsusingFTKImager,LiveDataAcquisitionusing FTKImager
InstallationofKALILinux,RAMDumpAnalysisusingVolatility,StaticDataAcquisitionfromLinux OS

UNIT-III

Recovering Deleted Files and Partitions: Digital Forensics Tools, Overview of EnCase Forensics,Deep Information Gathering Tool: Dmitry Page, Computer Forensics Live Practical byusing AutopsyandFTKImager

Network Forensics: Introduction to Network Forensics, Network Components and their forensicimportance, OSI internet Layers and their Forensic importance, Tools Introduction Wireshark andTCPDUMP,PacketSniffingandAnalysisusingEttercapandWireshark,WiresharkPacketAnalyzer,Packet Capture using TCPDUMP

WebsitePenetration:WHOIS,nslookup

UNIT-IV

Logs&EventAnalysis: ForensicAnalysisusingAUTOPSY:LinuxandWindows,ForensicsandLoganalysis,Compareand AUDIT Evidences using Hashdeep Page

Data Carving using Bulk Extractor: Kali Linux and Windows, Recovering Evidence from ForensicImagesusingForemost

Application Password Cracking: Introduction to Password Cracking, Password Cracking usingJohnthe Ripper, Password Cracking using Rainbow Tables, PDF File Analysis, Remote Imagingusing E3DigitalForensics

UNIT-V

WirelessandWebAttacks: WiFiPacketCaptureandPasswordCrackingusingAircrackng,IntroductiontoWebAttacks,WebsiteCopier:HTTRACK,SQLInjection,SiteReportGeneration:

Netcraft,VulnerabilityAnalysis:Nikto,WaybackMachine,ImageMetadataExtractionusingImago

EmailForensicsInvestigation: EmailForensicsInvestigations,**MobileDeviceForensics:**

MobileForensics

PreparationforDigitalForensicinvestigation: Investigativereports,expertwitnessandcyberregulations, IntroductiontoReport Writing,Forensic Reports & Expert Witness

TextBook(s)

1. **DigitalForensics**,*Dr.JeetendraPande,Dr.AjayPrasad,*UttarakhandOpenUniversity,Haldwan2016
2. *NilakshiJain,Dhananjay Kalbande*,**"DigitalForensic: The fascinatingworldof DigitalEvidences"**Wiley IndiaPvt Ltd 2017.
3. *CoryAltheide,HarlanCarvey***"Digitalforensicswithopensourcetools**"SyngressPublishing,Inc. 2011.
4. *ChrisMcNab*,**NetworkSecurityAssessment**,ByO'Reilly.

ReferenceBooks

1. *JasonLuttgens,MatthewPepe,KevinMandia*,**"IncidentResponseandcomputerforensics",**3rdEdition Tata McGraw Hill, 2014.
2. *ClintPGarrison,***"DigitalForensicsforNetwork,Internet,andCloudComputingAforensicevidenceguide formovingtargetsanddata"**,SyngressPublishing,Inc.2010

SUGGESTEDCO-CURRICULARACTIVITIES:

1. Trainingofstudentsby relatedindustrialexperts.
2. Assignments
3. Seminars,Groupdiscussions, Quiz,Debatesetc.(onrelatedtopics).
4. CaseStudies:VulnerabilityAssessmentofYourCollegeWebsite

VIIISemester

SkillbasedCourse25B:DigitalForensics

Credits-1

ListofExperiments:

1. StudyofComputerForensicsanddifferenttools usedforforensicinvestigation
2. HowtoRecoverDeletedFilesusingForensicsTools
3. Studythestepsforhidingandextractanytextfilebehindanimagefile/Audiofile(Steganography)
4. HowtoExtractExchangeableimagefileformat(EXIF)DatafromImageFilesusingExifreaderSoftware
5. DataAcquisitionusing FTKimager
6. Howto makethe forensicimageof theharddriveusing EnCaseForensics/Autopsy
7. HowtoRestoring theEvidenceImageusingEnCaseForensics/Autopsy
8. HowtoCollectEmailEvidenceinVictim PC
9. HowtoExtractingBrowserArtifacts
10. Howto ViewLast Activity of YourPC
11. FindLastConnectedUSBonyoursystem(USBForensics)
12. ComparisonoftwoFilesforforensicsinvestigationbyCompareITsoftware
13. LiveForensicsCase InvestigationusingAutopsy

Document : 3 (4) B.ScMathematics-2023

ANDHRAPRADESHSTATECOUNCILOFHIGHEREDUCATION

Programme:B.Sc.Mathematics(Major)

w.e.f. AY 2023-

24COURSESTRUCTURE

Year	Semester	Course	Titleof theCourse	No.of Hrs /Week	No.of Credits
I	I	1	Essentials and Applications ofMathematical,Physicala ndChemical Sciences	5	4
		2	AdvancesinMathematical,Physical andChemicalSciences	5	4
	II	3	DifferentialEquations&Problem SolvingSessions	5	4
		4	AnalyticalSolidGeometry&Problem SolvingSessions	5	4
II	III	5	GroupTheory&ProblemSolving Sessions	5	4
		6	Numerical Methods &ProblemSolvingSessions	5	4
		7	Laplace Transforms&Problem SolvingSessions	5	4
		8	SpecialFunctions&ProblemSolving Sessions	5	4
	IV	9	RingTheory&ProblemSolving Sessions	5	4
		10	IntroductiontoRealAnalysis& ProblemSolvingSessions	5	4
		11	IntegralTransforms&Problem SolvingSessions	5	4
III	V	12	Linear Algebra&ProblemSolvingSessions	5	4
		13	VectorCalculus& Problem solvingSessions	5	4
		14	Functions of a complex variables &Problemsolving Sessions **(OR)**AdvancedNumericalMethods & ProblemSolvingSessions	5	4
		15	Number Theory&ProblemSolvingSessions(OR)MathematicalStatistics &Problem SolvingSessions	5	4
	VI	SemesterInternship/Apprenticeshipwith12Credits			
		16	Algebra(OR)ClassicalMechanics	5	4
		17	RealAnalysis (OR)Discrete Mathematics	5	4

IV	VII	18	Basic Topology(OR) Cryptography	5	4
		SEC			
		19	LatticeTheory&BooleanAlgebra	5	4

Year	Semester	Course	Titleof theCourse	No.of Hrs /Week	No. ofCredits
			(OR)FiniteElementAnalysis		
		20	GraphTheory(OR)Mathematical Finance	5	4
	VIII	21	Advanced Algebra(OR)Elementsof Elasticity&FluidDynamics	5	4
		22	AdvancedAnalysis(OR)Advanced LinearAlgebra	5	4
		23	AdvancedTopology(OR)Differential Geometry	5	4
		SEC			
		24	OrdinaryDifferentialEquations(OR) ApplicationsofAlgebra	5	4
		25	OperationResearch (OR) MathematicalModelling	5	4

SEMESTER-I

COURSE 1:ESSENTIALS AND APPLICATIONS OF MATHEMATICAL, PHYSICALANDCHEMICALSCIENCES

Theory Credits:4 5 hrs/week

CourseObjective:

The objective of this course is to provide students with a comprehensive understanding of theessential concepts and applications of mathematical, physical, and chemical sciences. Thecourse aims to develop students' critical thinking, problem-solving, and analytical skills inthesеareas, enablingthemto applyscientificprinciplesto real-world situations.

Learningoutcomes:

1. Applycriticalthinkingskillstosolvecomplex problemsinvolvingcomplex numbers,trigonometricratios, vectors, andstatisticalmeasures.

2. ToExplainthebasicprinciplesandconceptsunderlyingabroadrangeoffundamentalareasof physics andto Connect theirknowledgeofphysicsto everydaysituations

3. ToExplainthebasicprinciplesandconceptsunderlyingabroadrangeoffundamentalareasof chemistryand toConnect theirknowledgeof chemistrytodailylife.

4. Understand the interplay and connections between mathematics, physics, and chemistry invarious applications. Recognize how mathematical models and physical and chemicalprinciplescan beusedtoexplain andpredict phenomenain differentcontexts.

5Toexplorethehistoryandevolutionofthe Internet andto gainanunderstandingofnetworksecurityconcepts, includingthreats, vulnerabilities, andcountermeasures.

UNITI:ESSENTIALSOFMATHEMATICS:

ComplexNumbers: Introductionofthenewsymboli–Generalformofacomplexnumber– Modulus-Amplitudeformandconversions

Trigonometric Ratios: Trigonometric Ratios and their relations – Problems on calculation ofangles**Vectors:** Definition of vector addition – Cartesian form – Scalar and vector product andproblems**StatisticalMeasures**:Mean, Median,Modeofadataandproblems

UNITII:ESSENTIALSOFPHYSICS:

Definition and Scope of Physics- Measurements and Units - Motion of objects: NewtonianMechanicsandrelativisticmechanicsperspective- LawsofThermodynamicsandSignificance- Acoustic waves and electromagnetic waves- Electric and Magnetic fields andtheirinteractions-Behaviourofatomicandnuclearparticles-Wave-particleduality,theuncertaintyprinciple-Theoriesand understandingofuniverse

UNITIII:ESSENTIALSOFCHEMISTRY::

Definition and Scope of Chemistry- Importance of Chemistry in daily life -Branches ofchemistry and significance- Periodic Table- Electronic Configuration, chemical changes,classificationofmatter,Biomolecules-carbohydrates,proteins, fatsandvitamins.

UNITIV:APPLICATIONSOFMATHEMATICS,PHYSICS &CHEMISTRY:

ApplicationsofMathematicsinPhysics&Chemistry: Calculus,DifferentialEquations&ComplexAnalysis

ApplicationofPhysicsinIndustryandTechnology:ElectronicsandSemiconductorIndustry,RoboticsandAutomation,AutomotiveandAerospaceIndustries,QualityControlandInstrumentation,Environmental MonitoringandSustainableTechnologies.

ApplicationofChemistryinIndustryandTechnology: ChemicalManufacturing,PharmaceuticalsandDrugDiscovery,MaterialsScience,FoodandBeverageIndustry.

UNITV:ESSENTIALSOFCOMPUTERSCIENCE:

Milestones of computer evolution - Internet, history, Internet Service Providers, Types ofNetworks,IP, Domain Name Services,applications.
Ethical and social implications: Network and security concepts- Information AssuranceFundamentals,Cryptography-SymmetricandAsymmetric,Malware,Firewalls,FraudTechniques-PrivacyandData Protection

Recommendedbooks:

1. FunctionsofonecomplexvariablebyJohn.B.Conway,Springer-Verlag.

2. ElementaryTrigonometrybyH.S.HallandS.R.Knight

3.VectorAlgebrabyA.R.Vasishtha,KrishnaPrakashanMedia(P)Ltd.4.

BasicStatisticsbyB.L.Agarwal,NewageinternationalPublishers

5. UniversityPhysicswithModernPhysicsbyHugh D.YoungandRogerA. Freedman

6. FundamentalsofPhysicsbyDavidHalliday,RobertResnick,andJearlWalker

7. PhysicsforScientistsandEngineerswithModernPhysics"byRaymondA.SerwayandJohnW.JewettJr.

8. PhysicsforTechnologyandEngineering"byJohnBird

9. Chemistryin dailylifebyKirpalSingh

10. ChemistryofbiomoleculesbyS.P.Bhutan

11. FundamentalsofComputersbyV.RajaRaman

12. CyberSecurityEssentialsbyJamesGraham,RichardHoward,RyanOlson

STUDENTACTIVITIES

UNITI:ESSENTIALSOFMATHEMATICS:

1:ComplexNumberExploration

Provide students with a set of complex numbers in both rectangular and polar

forms.They will plot the complex numbers on the complex plane and identify their

properties2:TrigonometricRatiosProblem Solving

Give students a set of problems that require the calculation of trigonometric ratios and theirrelations.

Students will solve the problems using the appropriate trigonometric functions (sine, cosine,tangent,etc.)and trigonometric identities.

3:VectorOperationsandApplications

ProvidestudentswithasetofvectorsinCartesianform.

Students will perform vector addition and subtraction operations to find the resultant

vectors.Theywill also calculate thescalarand vector productsof given vectors.

4:Statistical MeasuresandDataAnalysis

Givestudentsadatasetcontainingnumericalvalues.

Students will calculate the mean, median, and mode of the data, as well as other statisticalmeasuresifappropriate (e.g.,range, standard deviation).
Theywillinterprettheresultsandanalyzethe central tendenciesanddistributionofthedata.

UNITII:ESSENTIALSOFPHYSICS:

1. ConceptMapping

Dividestudentsintogroupsandassigneach grouponeofthetopics.

Students will create a concept map illustrating the key concepts, relationships, andapplicationsrelated to their assigned topic.

Encouragestudentstousevisualelements,arrows,andlabelstorepresent connectionsandinterdependenciesbetween concepts.

2. LaboratoryExperiment

Select a laboratory experiment related to one of the topics, such as motion of objects orelectric and magneticfields.
Provide the necessary materials, instructions, and safety guidelines for conducting theexperiment.
Studentswill workinsmall groupstocarryouttheexperiment,collectdata,andanalyzetheresults.

After the experiment, students will write a lab report summarizing their findings,observations,and conclusions.

UNITIII:ESSENTIALSOFCHEMISTRY

1:Chemistryin DailyLifePresentation

Divide students into groups and assign each group a specific aspect of daily life wherechemistryplaysasignificantrole,suchasfoodandnutrition,householdproducts,medicine,oren vironmentalissues.
Studentswillresearchandcreateapresentation(e.g.,PowerPoint,poster,orvideo)thatshowcasesthe importance ofchemistryin theirassignedaspect.
2:PeriodicTableExploration

Providestudentswith acopyofthe periodictable.

Studentswill exploretheperiodictableand itssignificanceinorganizingelements basedontheirproperties.
They will identify and analyze trends in atomic structure, such as electronic configuration,atomicsize, and ionizationenergy.

3:ChemicalChangesandClassificationofMatter

Provide students with various substances and chemical reactions, such as mixing acids andbasesor observingacombustion reaction.
Studentswillobserveand describethechemicalchangesthatoccur,includingchangesincolor,temperature, ortheformation of newsubstances.
4:BiomoleculesInvestigation

Assigneachstudentorgroupaspecificbiomoleculecategory,suchascarbohydrates,proteins,fats,or vitamins.
Studentswillresearchandgatherinformationabouttheirassignedbiomoleculecategory,includingit s structure,functions,sources,and importancein thehumanbody.

Theycan createinformativepostersorpresentations topresenttheirfindingstotheclass.

UNITIV:APPLICATIONSOFMATHEMATICS,PHYSICS &CHEMISTRY

1:InterdisciplinaryCase Studies

Dividestudentsintosmallgroupsandprovidethemwithinterdisciplinarycasestudiesthatinvolveth einterdisciplinaryapplicationofmathematics, physics, andchemistry.

Each case study should present a real-world problem or scenario that requires the integrationofconcepts fromall three disciplines.

2:DesignandInnovation Project

Challenge students to design and develop a practical solution or innovation that integratesmathematics,physics, and chemistryprinciples.
Studentscanchooseaspecificproblemorareaofinterest,suchasrenewableenergy,environmentalc onservation, or materials science.
3: LaboratoryExperiments

Assignstudents laboratoryexperimentsthat demonstrate thepractical applications of

mathematics,physics,andchemistry.

Examples include investigating the relationship between concentration and reaction rate,analyzingthebehaviorof electricalcircuits,ormeasuringthepropertiesof materials.

.4:MathematicalModeling

Presentstudentswithreal-worldproblemsthatrequiremathematicalmodelingandanalysis.

UNITV:ESSENTIALSOFCOMPUTERSCIENCE:

1. Identifyingtheattributesofnetwork(Topology,serviceprovider,IPaddressandbandwidthof
2. yourcollegenetwork)andpreparareportcoveringnetworkarchitecture.
3. Identifythetypesofmalwaresandrequiredfirewallstoprovidesecurity.
4. LatestFraudtechniquesusedbyhackers.

SEMESTER-I

COURSE 2: ADVANCES IN MATHEMATICAL, PHYSICALAND CHEMICALSCIENCES

Theory Credits:4 5 hrs/week

CourseObjective:

The objective of this course is to provide students with an in-depth understanding of the recentadvances and cutting-edge research in mathematical, physical, and chemical sciences. Thecourseaimstobroadenstudents'knowledgebeyondthefoundationalconceptsandexposethemto the latest developments in these disciplines, fostering critical thinking, research skills, andtheabilityto contribute to scientificadvancements.

Learningoutcomes:

1. Explore the applications of mathematics in various fields of physics and chemistry, tounderstandhow mathematical conceptsareusedto modeland solvereal-worldproblems.

2. ToExplainthebasicprinciplesandconceptsunderlyingabroadrangeoffundamental areasofphysics and to Connecttheir knowledgeof physics to everydaysituations.

3. Understand the different sources of renewable energy and their generation processes andadvances in nanomaterials and their properties, with a focus on quantum dots. To study theemergingfieldofquantumcommunicationanditspotentialapplications.Togainanunderstandin g of the principles of biophysics in studying biological systems. Explore thepropertiesandapplications of shape memorymaterials.

3. Understand the principles and techniques used in computer-aided drug design and drugdeliverysystems,tounderstandthefabricationtechniquesandworkingprinciplesofnanosensor s.Exploretheeffects of chemicalpollutantsonecosystemsandhuman health.

4. Understand the interplay and connections between mathematics, physics, and chemistry invariousadvancedapplications.Recognizehowmathematicalmodelsandphysicalandchemicalpr inciplescan beusedto explainand predictphenomenain different contexts.

5 Understand and convert between different number systems, such as binary, octal, decimal,andhexadecimal.Differentiatebetweenanalogand digitalsignalsandunderstandtheirchara cteristics.Gain knowledge of different types of transmission media, such as wired (e.g.,coppercables,fiberoptics)and wireless(e.g.,radio waves, microwave, satellite)..

UNITI:ADVANCESINBASICSMATHEMATICS

Straight Lines: Different forms – Reduction of general equation into various forms – Pointofintersectionoftwo straightlines

Limits and Differentiation: Standard limits – Derivative of a function –Problems onproduct ruleand quotientrule

Integration: Integrationasareverseprocessofdifferentiation–Basicmethodsofintegration

Matrices: Types of matrices – Scalar multiple of a matrix – Multiplication of matrices – Transposeofamatrixand determinants

UNITII:ADVANCESINPHYSICS:

Renewable energy: Generation, energy storage, and energy-efficient materials and devices.**Recent advances in the field of nanotechnology**: Quantum dots, Quantum Communication-recent advancesinbiophysics-recentadvancesinmedicalphysics-ShapeMemoryMaterials.

UNITIII:ADVANCESINCHEMISTRY:

Computeraideddrugdesignanddelivery,nanosensors,Chemical Biology,impactofchemicalpollutantson ecosystemsand human health,Dyeremoval -Catalysis method

UNITIV:ADVANCEDAPPLICATIONSOFMATHEMATICS,PHYSICS&CHEMISTRY

Mathematical Modelling applications in physics and

chemistryApplication of Renewable energy: Grid Integration and

Smart Grids,**Application ofnanotechnology**: Nanomedicine,

Applicationofbiophysics:BiophysicalImaging,Biomechanics,Neurophysics,

Applicationofmedicalphysics:RadiationTherapy,Nuclearmedicine

Solidwastemanagement,Environmentalremediation-GreenTechnology,Watertreatment.

UNITV:AdvancedApplications ofcomputerScience

Number System-Binary, Octal, decimal, and Hexadecimal, Signals-Analog, Digital, Modem,Codec, Multiplexing, Transmission media, error detection and correction- Parity check andCRC,Networkingdevices-Repeater,hub, bridge,switch,router,gateway.

Recommendedbooks:

1. Coordinate GeometrybyS.L.Lony,Arihant Publications
2. CalculusbyThomasandFinny,PearsonPublications
3. MatricesbyA.R.VasishthaandA.K.Vasishtha,Krishna PrakashanMedia(P)Ltd.
4. "RenewableEnergy:PowerforaSustainableFuture"byGodfreyBoyle
5. "EnergyStorage:ANontechnicalGuide"byRichardBaxter
6. "Nanotechnology:PrinciplesandApplications"bySulabhaK.Kulkarni and RaghvendraA.Bohara
7. "Biophysics:AnIntroduction" byRodneyCotterill
8. "MedicalPhysics:Imaging"byJamesG.Webster
9. "ShapeMemoryAlloys: PropertiesandApplications"byDimitrisC.Lagoudas
10. NanomaterialsandapplicationsbyM.N.Borah

11. Environmental ChemistrybyAnil.K.D.E.

12. DigitalLogicDesignbyMorrisMano

13. DataCommunication&NetworkingbyBahrouzForouzan.

STUDENT

ACTIVITIESUNITI:ADVANCES INBASIC

MATHEMATICS

1:StraightLinesExploration

Providestudentswithasetofequationsrepresentingstraightlinesindifferentforms,suchasslope-interceptform,point-slope form, orgeneral form.

Studentswillexplorethepropertiesandcharacteristicsofstraightlines,includingtheirslopes,interc epts,and pointofintersection.
2:LimitsandDifferentiationProblemSolving

Studentswillapplytheconceptoflimitstosolvevariousproblemsusingstandardlimits.

Encouragestudentstointerprettheresultsandmakeconnectionstoreal-worldapplications,such asanalyzingrates of changeoroptimizingfunctions.

3:IntegrationExploration
Studentswillexploretheconceptofintegrationasareverseprocessofdifferentiationandapplybasicmethod sofintegration,suchastheproductrule,substitutionmethod,or
integrationbyparts.

Studentscandiscussthesignificanceofintegrationinvariousfields,suchasphysicsandchemistry4:Matri cesManipulation

Studentswillperformoperationsonmatrices,includingscalarmultiplication,matrixmultiplication,andmatrix transpose.

Studentscanapplytheirknowledgeofmatricestoreal-
worldapplications,suchassolvingsystemsofequationsorrepresentingtransformationsingeometry.

UNITII:ADVANCES INPHYSICS:

1: CaseStudies

Providestudentswithreal-
worldcasestudiesrelatedtorenewableenergy,nanotechnology,biophysics,medicalphysics, or shapememorymaterials.
Students will analyze the case studies, identify the challenges or problems presented, andproposeinnovativesolutionsbasedon the recentadvances in therespectivefield.
They will consider factors such as energy generation, energy storage, efficiency,sustainability,materialsdesign,biomedicalapplications,ortechnologicaladvance ments.2:ExperimentalDesign

Assign students to design and conduct experiments related to one of the topics: renewableenergy,nanotechnology,biophysics,medicalphysics,orshapememorymaterials.
Theywillidentifyaspecificresearch questionorproblem toinvestigate anddesignan

experimentaccordingly.

Students will collect and analyze data, interpret the results, and draw conclusions based ontheirfindings.

Theywill discusstheimplications oftheirexperimentalresultsinthecontextofrecentadvancesinthefield.

3:GroupDiscussionand Debate

Organize a group discussion or debate session where students will discuss the ethical, social, andenvironmental implications of the recent advances in renewable energy, nanotechnology,biophysics,medicalphysics, and shape memorymaterials.

Assign students specific roles, such as proponent, opponent, or moderator, and provide them withkeypoints andargumentsto support theirpositions.

UNITIII:ADVANCESINCHEMISTRY:

1. ExperimentalDesignandSimulation

Insmallgroups,studentswilldesignexperiments orsimulationsrelatedtotheassigned topic.

Forexample,inthecontextofcomputer-aideddrugdesign,studentscoulddesignavirtualscreeningexperiment to identifypotential drugcandidatesforaspecificdiseasetarget.

Fornanosensors,studentscoulddesignan experimenttodemonstratethe sensitivityandselectivityof nano sensorsin detectingspecificanalytes.
Chemicalbiology-related activitiescouldinvolvedesigningexperimentstostudyenzyme-substrateinteractions ormolecularinteractions in biological systems.
Studentswillperformtheirexperimentsorsimulations,collectdata,analyzetheresults,anddrawconclusions basedon their findings.

2. CaseStudiesandDiscussion

Providestudentswithreal-worldcasestudies relatedtotheimpactofchemicalpollutantsonecosystems and human health.
Students will analyze the case studies, identify the sources and effects of chemical pollutants, andproposemitigation strategiesto minimize theirimpact.

Encouragediscussions ontheethicalandenvironmentalconsiderationswhendealingwithchemical pollutants.
Forthedye removal usingthe catalysis method,studentscanexplorecasestudieswherecatalyticprocessesareusedtodegradeorremovedyes fromwastewater.

Studentswilldiscusstheprinciples ofcatalysis,theadvantages andlimitationsofthecatalysismethod, andits applications inenvironmentalremediation.
3:GroupProject

Assignstudentsto workingroups todevelop aprojectrelated tooneofthetopics.

Theproject couldinvolvedesigningacomputer-aideddrugdeliverysystem,developinganano sensorforaspecificapplication,orproposingstrategies tomitigate theimpact ofchemicalpollutantson

ecosystems.
Students will develop a detailed project plan, conduct experiments or simulations, analyzedata,andpresent theirfindingsand recommendations.
Encouragecreativity,criticalthinking,andcollaborationthroughouttheproject.

UNITIV:ADVANCEDAPPLICATIONSOFMATHEMATICS,PHYSICS&CHEMISTRY

1:MathematicalModellingExperiment

Providestudentswith amathematicalmodellingexperimentrelatedtooneofthetopics.Forexample,inthecontextofrenewableenergy,studentscandevelopamathematicalmodeltooptimizethe placement and configuration of solar panels in asolarfarm.
Students will work in teams to design and conduct the experiment, collect data, and analyze theresults usingmathematical models and statistical techniques.
Theywill discuss theaccuracyand limitations oftheirmodel,proposeimprovements, and interpret the implications of their findings in the context of renewable energy or the specificapplication area.

2:CaseStudiesand GroupDiscussions

Assign students to analyze case studies related to the applications of mathematical modellinginnanotechnology, biophysics, medical physics, solid waste management, environmental remediation,orwatertreatment.
Studentswilldiscussthemathematicalmodelsandcomputationalmethodsusedinthecasestudies,analyze theoutcomes, and evaluatetheeffectivenessofthemodellingapproach.
Encouragegroupdiscussionsonthechallenges,ethicalconsiderations,andpotentialadvancements in thefield.

Studentswillpresenttheirfindingsandengageincriticaldiscussions ontheadvantagesandlimitationsofmathematical modellinginsolvingcomplexproblemsinthesеareas.

3. GroupProject

Assign students to work in groups to develop a group project that integrates mathematical modellingwithoneoftheapplicationareas:renewableenergy,nanotechnology,biophysics,medicalphysics,solidwastemanagement,environmentalremediation, orwatertreatment.

The project could involve developing a mathematical model to optimize the delivery of radiationtherapy in medical physics or designing a mathematical model to optimize wastemanagementpractices.
Students will plan and execute their project, apply mathematical modelling techniques,analyzetheresults,and present their findings andrecommendations.
Encouragecreativity,criticalthinking,andcollaborationthroughouttheproject.

UNITV:AdvancedApplications ofcomputerScience

Studentsmust be able toconvert numbersfrom othernumber system to binarynumbersystems

1. Identify the networking media used for your college networkIdentifyallthenetworkingdevicesusedinyour collegepremises.

SEMESTER-II

COURSE3:DIFFERENTIALEQUATIONS

Theory Credits:4 5 hrs/week

CourseOutcomes

Aftersuccessful completionofthis course,the studentwill beable to

1. solvefirstorderfirstdegreelineardifferentialequations.
2. convertanon-exacthomogeneousequationto exactdifferentialequationbyusinganintegratingfactor.
3. knowthemethods offindingsolution ofadifferential equationoffirst orderbut not offirstdegree.
4. solve higher-order linear differential equations for both homogeneous and non-homogeneous,withconstant coefficients.
5. understandandapplytheappropriatemethodsforsolvinghigherorderdifferentialequations.

CourseContent

Unit– 1

DifferentialEquationsof firstorderandfirstdegree

LinearDifferentialEquations –Bernoulli'sEquations-ExactDifferentialEquations–Integratingfactors-Equations reducibleto Exact EquationsbyIntegratingFactors-

i)InspectionMethod ii) $\frac{1}{Mx+Ny}$ iii) $\frac{1}{Mx-Ny}$

Unit– 2

DifferentialEquationsoffirstorderbutnotoffirstdegree

Equations solvable for p, Equations solvable for y, Equations solvable for$x$ – Clairaut's equation - OrthogonalTrajectories:Cartesian and Polarforms.

Unit– 3

Higherorderlineardifferentialequations

Solutionsofhomogeneouslineardifferentialequationsoforder$n$withconstantcoefficients-Solutions of non-homogeneous linear differential equations with constant coefficients by means ofpolynomialoperators

(i) $Q(x)= e^{ax}$ (ii) $Q(x)=Sinax$(or)$Cosax$

Unit– 4

Higherorderlineardifferentialequations(continued.)

Solutiontoanon-homogeneouslineardifferentialequationwithconstantcoefficients

P.I.of$f(D)y=Q$when$Q=bx^k$

P.I.of$f(D)y=Q$when$Q=e^{ax}V$,where$V$isafunctionof$x$

of$f(D)y=Q$when$Q=xV$,where$V$is afunctionof$x$

Unit– 5

Higherorderlineardifferentialequationswithnon-constantcoefficients

LineardifferentialEquationswithnon-constantcoefficients;Cauchy-EulerEquation;LegendreEquation;Method of variation ofparameters

Activities

Seminar/Quiz/Assignments/ApplicationsofDifferentialEquationstoReallifeProblem/ProblemSolvingSessions.

TextBook

Differential Equations and Their Applications by Zafar Ahsan, published by Prentice-Hall ofIndiaPvt.Ltd, New Delhi-Second edition.

ReferenceBooks

1. Ordinaryand Partial Differential Equations byDr.M.D. Raisinghania, published byS. Chand&Company,New Delhi.
2. Differential Equations with applications and programs – S. Balachandra Rao & HR Anuradha-UniversitiesPress.
3. DifferentialEquations-SrinivasVangala&Madhu Rajesh,publishedbySpectrumUniversityPress.

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SEMESTER-II

COURSE4:ANALYTICALSOLIDGEOMETRY

Theory Credits:4 5 hrs/week

CourseOutcomes

Aftersuccessful completionofthis course,the studentwill beable to

1. understandplanesandsystemofplanes
2. knowthedetailed ideaoflines
3. understandspheresandtheirproperties
4. knowsystemofspheres andcoaxialsystemofspheres
5. understandvarioustypesofcones

CourseContent

Unit – 1ThePlane

Equation of plane intermsof its interceptson theaxis- Equationsof the plane through the givenpoints - Length of the perpendicular from a given point to a given plane- Bisectors of angles betweentwoplanes -Combined equationoftwo planes-Orthogonal projection on a plane.

Unit – 2TheLine

Equation of a line - Angle between a line and a plane - The condition that a given line may lie in agiven plane - The condition that two given lines are coplanar - Number of arbitrary constants in theequations of straight line - Sets of conditions which determine a line - The shortest distance betweentwo lines - The length and equations of the line of shortest distance between two straight lines - Lengthoftheperpendicularfrom a given point to agiven line.

Unit – 3TheSphere

Definition and equation of the sphere - Equation of the sphere through four given points - Planesectionsofasphere-Intersectionoftwospheres-Equationofacircle-Spherethrougha given circle - Intersectionofasphere andaline -Power ofapoint -Tangentplane-Planeof contact;Polarplane - PoleofaPlane-Conjugatepoints-Conjugate planes.

Unit – 4Spheres(continued)

Angleofintersectionoftwospheres-Conditionsfortwospherestobeorthogonal-Radicalplane;Coaxialsystem of spheres-Simplified fromof theequationoftwo spheres.

Unit – 5Cones

Definitions of a cone – vertex, guiding curve and generators - Equation of the cone with a given vertexand guiding curve - Equations of cones with vertex at origin are homogenous - Condition that thegeneral equation of the second degree should represent a cone - Enveloping cone of a sphere - Rightcircularcone- Equationoftherightcircular cone withagiven vertex,axisandsemi verticalangle.

Activities

Seminar/Quiz/Assignments/ThreedimensionalanalyticalSolidgeometryanditsapplications/ Problem SolvingSessions.

TextBook

AnalyticalSolidGeometrybyShantiNarayanandP.K.Mittal,publishedbyS.Chand&CompanyLtd. 7th Edition.

ReferenceBooks

1. AtextBookofAnalyticalGeometryofThreeDimensions,byP.K.JainandKhaleelAhmed,publishedby WileyEasternLtd., 1999.
2. Co-ordinateGeometryoftwoandthreedimensionsbyP.Balasubrahmanyam,K.Y.Subrahmanyam,G.R.Venkataraman publishedbyTataMcGraw-Hill Publishers.
3. SolidGeometrybyB. Rama Bhupal Reddy, published bySpectrum UniversityPress.

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SEMESTER-

IIICOURSE5:GROUPTHEOR

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Theory Credits:4 5 hrs/week

CourseOutcomes

Aftersuccessful completionofthis course,the studentwill beable to

1. acquirethebasicknowledge andstructureofgroups
2. getthesignificanceofthenotation ofasubgroupandcosets.
3. understandtheconceptofnormalsubgroupsandpropertiesof normalsubgroup
4. studythe homomorphisms andisomorphisms withapplications.
5. understandthepropertiesofpermutationandcyclicgroups

CourseContent

Unit – 1Groups

BinaryOperation–Algebraicstructure–semigroup-monoid–Groupdefinitionandelementaryproperties Finiteand Infinitegroups –examples–orderofa group,Compositiontableswithexamples.

Unit – 2SubGroups

Complex Definition – Multiplication of two complexes Inverse of a complex-Subgroup definition-examples-criterion for a complex to be a subgroups; Criterion for the product of two subgroups to be asubgroup-union and Intersection of subgroups. Coset Definition – properties of Cosets – Index of asubgroupsof afinitegroups–Lagrange's Theorem.

Unit – 3NormalSubgroups

Normal Subgroups: Definition of normal subgroup – proper and improper normal subgroup– Hamiltongroup- Criterion for a subgroup to be a normal subgroup – intersection of two normal subgroups Subgroupof index2 is a normal sub group

Unit – 4Homomorphisms

Quotient groups,Definition of homomorphism – Image of homomorphism elementary properties ofhomomorphism – Isomorphism – automorphism definitions and elementary properties–kernel of ahomomorphism – fundamental theorem on Homomorphism andapplications.

Unit – 5PermutationsandCyclicGroups

Definitionofpermutation–permutationmultiplication–Inverseofapermutation–cyclicpermutations– transposition– evenand odd permutations–Cayley's theorem.
CyclicGroups-Definitionofcyclicgroup –elementaryproperties –classification ofcyclic groups.

Activities

Seminar/Quiz/Assignments/ApplicationsofGroupTheorytoReallifeProblem/ProblemSolvingSessions.

TextBook

ModernAlgebrabyA.R.VasishthaandA.K.Vasishtha, KrishnaPrakashanMediaPvt.Ltd.,Meerut.

ReferenceBooks

1. Abstract AlgebrabyJ.B. Fraleigh, Published byNarosapublishinghouse.
2. ModernAlgebrabyM.L. Khanna,Jai Prakashand Co. PrintingPress, Meerut
3. RingsandLinearAlgebrabyPundir&Pundir,publishedbyPragathiPrakashan

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SEMESTER-III

COURSE6:NUMERICALMETHODS

Theory Credits:4 5 hrs/week

CourseOutcomes

Aftersuccessful completionofthis course,the studentwill beable to

1. differencebetweentheoperatorsΔ,∇,Eandtherelationbetweenthem
2. know about the Newton – Gregory Forward and backward interpolation3.knowtheCentralDifference operatorsδ,μ,σandrelationbetweenthem
4. solveAlgebraicandTranscendentalequations
5. understandtheconcept ofCurvefitting

Course ContentUnit –1

Thecalculusoffinitedifferences

Theoperators Δ,∇,E -Fundamentaltheoremofdifferencecalculus-propertiesof Δ,∇,E and

problems on them to express any value of the function in terms of the leading terms and the leadingdifferences - relations between E and D - relation between D and Δ- problems on one or more missingterms-Factorialnotation-problemson separationofsymbols-problems onFactorial notation.

Unit– 2

Interpolationwithequalandunequalintervals

DerivationsofNewton–GregoryForwardandbackwardinterpolationandproblemsonthem.Divideddifferences-Newton divideddifference formula- Lagrange's andproblemsonthem.

Unit– 3

CentralDifferenceInterpolationformulae

CentralDifferenceoperatorsδ,μ,σandrelationbetweenthem-Gaussforwardformulaforequal intervals-GaussBackwardformula-Stirlingsformula-Bessel'sformulaandproblemsontheaboveformulae.

Unit– 4

SolutionofAlgebraicandTranscendentalequation

Method for finding initial approximate value of the root - Bisection method - to find the solution ofgiven equations by using (i) Regula Falsi method(ii) Iteration method(iii) Newton – Raphson'smethodand problems onthem.

Unit – 5CurveFittin g

Least-squarescurvefittingprocedures-fittingastraightline-nonlinearcurvefitting-curvefittingbyasumof exponentials

Activities

Seminar/Quiz/Assignments/ApplicationsofNumericalmethodstoReallifeProblem/ProblemSolving Sessions.

TextBook

NumericalAnalysisbyG.ShankerRao, NewAge InternationalPublications

ReferenceBooks

1. AppliedNumericalAnalysisbyCurtisF.GeraldandPatrickO.Wheatley,Pearson,(2003)7thEdition
2.IntroductoryMethodsofNumericalAnalysisbyS.S.Sastry,(6th Edition)PHINew Delhi2012

3. NumericalMethodsfor Scientific andEngineeringComputationbyM.K. Jain,S.R.K.Iyengarand R.K.Jain,NewAgeInternationalPublishers(2012),6thedition.

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SEMESTER-III

COURSE7:LAPLACETRANSFORMS

Theory Credits:4 5hrs/week

CourseOutcomes

Aftersuccessful completionofthis course,the studentwill beable to

1. understandthedefinitionand propertiesof Laplacetransformations
2. getanidea aboutfirst andsecondshiftingtheoremsand changeof scaleproperty
3. understandLaplacetransformsofstandard functionslikeBessel,Errorfunctionetc
4. knowthereversetransformationof Laplace andproperties
5. gettheknowledgeof applicationofconvolutiontheorem

CourseContent

Unit– 1LAPLACETRANSFORMS–I

Definition of Laplace Transform -Linearity Property - Piecewise Continuous Function - Existence ofLaplace Transform-Functionsof Exponentialorder and ofClass A.

Unit– 2

LAPLACETRANSFORMS –II

First Shifting Theorem, Second Shifting Theorem, Change of Scale Property, Laplace transform of thederivativeof f(t),Initialvalue theoremand Finalvalue theorem.

Unit– 3

LAPLACETRNASFORM–III

Laplace Transform of Integrals - Multiplication by t, Multiplication by t^n - division by t - Laplacetransform of Bessel Function - Laplace Transform of Error Function -Laplacetransform of Sine andCosineintegrals.

Unit– 4

INVERSELAPLACETRANSFORMS–I

DefinitionofInverseLaplaceTransform-LinearityProperty-FirstShiftingTheorem-SecondShiftingTheorem-Changeof Scale property-useof partial fractions-Examples.

Unit– 5

INVERSELAPLACETRANSFORMS–II

Inverse Laplace transforms of Derivatives - Inverse Laplace Transforms of Integrals -Multiplication byPowers of 'p' - Division by powers of 'p' - Convolution Definition -Convolution Theorem - proof andApplications -Heaviside's Expansion theorem and itsApplications.

Activities

Seminar/Quiz/Assignments/ApplicationsofLaplaceTransformstoReallifeProblem/ProblemSolvingSessions.

TextBook

LaplaceTransformsbyA.R.Vasishtha,Dr.R.K.Gupta,KrishnaPrakashanMediaPvt.Ltd.,Meerut.

ReferenceBooks

1. IntroductiontoAppliedMathematicsbyGilbertStrang,CambridgePress
2. Laplace andFouriestransforms byDr.J.K.GoyalandK.P. Guptha,PragathiPrakashan,Meerut.

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SEMESTER-III

COURSE8:SPECIAL FUNCTIONS

Theory Credits:4 5hrs/week

LearningOutcomes

Aftersuccessfulcompletion ofthecoursewill beableto

1. UnderstandtheBetaandGammafunctions,theirpropertiesandrelationbetweenthesetwofunctions,understandtheorthogonalpropertiesofChebyshevpolynomialsandrecurrencerelations.
2. Findpowerseriessolutionsofordinarydifferentialequations.
3. Solve Hermite equation and write the Hermite Polynomial of order (degree) n, alsoFindthe generatingfunction forHermitePolynomials, studytheorthogonalpropertiesofHermitePolynomials and recurrencerelations.
4. Solve Legendre equation and write the Legendre equation of first kind, also find thegenerating function for Legendre Polynomials, understand the orthogonal properties ofLegendrePolynomials.
5. Solve Bessel equation and write the Bessel equation of first kind of order n, also find thegenerating function for Bessel function understand the orthogonal properties of Besselunction.

CourseContent

Unit–1

BetaandGammafunctions,Chebyshevpolynomials

Euler'sIntegrals-BetaandGammaFunctions,ElementarypropertiesofGammaFunctions,TransformationofGammaFunctions. AnotherformofBetaFunction,RelationbetweenBetaandGammaFunctions.Chebyshevpolynomials,orthogonalpropertiesofChebyshevpolynomials,recurrencerelations,generatingfunctionsforChebyshevpolynomials.

Unit–2PowerseriesandPowerseriessolutionsofordinarydifferentialequations

Introduction,summaryofusefulresults,powerseries,radiusofconvergence,theorems on Power seriesIntroductionofpowerseriessolutionsofordinarydifferential equation Ordinaryandsingularpoints,regularandirregularsingularpoints,powerseriessolution.

Unit–3Hermitepolynomials

HermiteDifferentialEquations,SolutionofHermiteEquation,Hermitepolynomials,generatingfunctionfor Hermite polynomials.OtherformsforHermitePolynomials,RodriguesformulaforHermite Polynomials, to find first few HermitePolynomials.OrthogonalpropertiesofHermitePolynomials,Recurrenceformulaefor HermitePolynomials.

Unit–4Legendrepolynomials

Definition,SolutionofLegendre'sequation,Legendrepolynomialofdegreen,generatingfunctionofLegendre polynomials.Definitionof$P_n(x)$and$Q_n(x)$, GeneralsolutionofLegendre'sEquation(derivationsnot required)toshowthat$P_n(x)$isthecoefficientofh^n,intheexpansionof $(1-2xh+h^2)^{-1/2}$OrthogonalpropertiesofLegendre'spolynomials,RecurrenceformulasforLegendre'sPolynomials.

Unit–5

Bessel'sequation Definition,SolutionofBessel'sequation,Bessel'sfunctionofthefirstkindof ordern,Bessel's functionofthesecondkindofordern.
IntegrationofBessel'sequationinseriesform=0, Definition of x recurrenceformulaefor$J_n(x)$ J_nGeneratingfunctionfor$J_n(x)$, orthogonallyofBesselfunctions.**A**

ctivities

Seminar/Quiz/Assignments/ApplicationsofSpecialfunctionstoReallifeProblem/Problem SolvingSessions.

TextBook

SpecialFunctionsbyJ.N.SharmaandDr.R.K.Gupta,KrishnaPrakashan,

ReferenceBooks

1. Dr.M.D.Raisinghania,OrdinaryandPartialDifferentialEquations,S.Chand&CompanyPvt.Ltd.,Ram Nagar, New Delhi-110055.
2. ShantiNarayanandDr.P.K.Mittal,IntegralCalculus,S. Chand&CompanyPvt.Ltd.,RamNagar,NewDelhi-110055.
3. GeorgeF.Simmons,DifferentialEquationswithApplicationsandHistoricalNotes,Tata McGRAW-HillEdition,1994.

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SEMESTER-IV

COURSE 9:RINGTHEORY

Theory Credits:4 5hrs/week

CourseOutcomes

Aftersuccessfulcompletion ofthis course,the studentwill beable to

1. acquirethebasicknowledgeofrings,fieldsandintegral domains
2. gettheknowledgeofsubringsandideals
3. constructcompositiontablesforfinitequotient rings
4. studythe homomorphisms and isomorphisms withapplications.
5. gettheideaofdivisionalgorithm ofpolynomials overafield.

CourseContent

Unit – 1RingsandFields

Definition of a ring and Examples –Basic properties – Boolean rings -Fields – Divisors of 0 andCancellation Laws– Integral Domains – Division ring - The Characteristic of a Ring, Integral domainandField – NonCommutativeRings-Matrices over afield–TheQuaternion ring.

Unit – 2SubringsandIdeals

Definitionand examples ofSubrings– Necessaryand sufficient conditionsforasubsetto beasubring – Algebra of Subrings – Centre of a ring – left, right and two sided ideals – Algebra of ideals – Equivalenceof afieldand acommutativeringwithout proper ideals

UnitIII:Principalidealsand Quotientrings

Definition of a Principal ideal ring(Domain) – Every field is a PID – The ring of integers is a PID – Example of a ring which is not a PIR – Cosets – Algebra of cosets – Quotient rings – Construction ofcomposition tablesforfinitequotient ringsoftheringZof integersand the ring$Z_n$ofintegers modulo n.

Unit – 4HomomorphismofRings

Homomorphism of Rings – Definition and Elementary properties – Kernel of a homomorphism – Isomorphism – Fundamental theorems of homomorphism of rings – Maximal and prime Ideals – PrimeFields

Unit– 5 RingsofPolynomials

Polynomialsinanindeterminate–TheEvaluationmorphism--TheDivisionAlgorithmin$F[x]$– IrreduciblePolynomials–Ideal Structurein$F[x]$– Uniquenessof Factorization$F[x]$.

Activities

Seminar/Quiz/Assignments/ApplicationsofringtheoryconceptstoReallifeProblem/ProblemSolvingSessions.

Textbook

ModernAlgebrabyA.R.VasishtaandA.K.Vasishta, KrishnaPrakashanMediaPvt.Ltd.

Referencebooks

1. AFirstCourseinAbstractAlgebrabyJohn.B.Farleigh,NarosaPublishingHouse.
2. LinearAlgebrabyStephen.H.FriedbergandOthers,PearsonEducationIndia

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SEMESTER-IV

COURSE10:INTRODUCTIONTO REALANALYSIS

Theory Credits:4 5hrs/week

CourseOutcomes

Aftersuccessfulcompletionofthiscourse,thestudentwillbeableto

1. getclearideaaboutthe realnumbersandrealvaluedfunctions.
2. obtaintheskillsofanalysingtheconceptsandapplyingappropriatemethodsfortesting convergenceof asequence/ series.
3. testthecontinuityanddifferentiabilityandRiemannintegrationofafunction.
4. knowthegeometricalinterpretationofmeanvaluetheorems.
5. knowaboutthefundamentaltheoremofintegralcalculus

CourseContents

Unit – 1REALNUMBERS,REALSEQUENCES

Thealgebraicandorder properties of R-AbsolutevalueandReal line-CompletenesspropertyofR-Applications of supremum property - intervals. (**No question is to be set from this portion)**SequencesandtheirlimitsRangeandBoundednessofSequences-LimitofasequenceandConvergentsequence-The Cauchy'scriterion- properlydivergentsequences-Monotonesequences-NecessaryandSufficientconditionforConvergenceofMonotoneSequence-LimitPointofSequence-SubsequencesandtheBolzano-weierstrasstheorem–CauchySequences–Cauchy'sgeneralprincipleof convergence.

Unit – 2INFINITIESERIES

Introductiontoseries -convergenceofseries -Cauchy'sgeneralprincipleofconvergencefor series testsforconvergenceofseries-Seriesofnon-negativeterms-P-test-Cauchy'snthroottest-D'-Alembert'sTest-AlternatingSeries–LeibnitzTest.

Unit–3 LIMIT&CONTINUITY

Real valued Functions - Boundedness of a function - Limits of functions - Some extensions of thelimitconcept-InfiniteLimits-Limitsatinfinity**(Noquestionistobesetfromthisportion).**Continuous functions - Combinations of continuous functions - Continuous Functions onintervals-uniform continuity.

Unit– 4 DIFFERENTIATIONANDMEANVALUETHEORMS

The derivability of a functionat a point and andon an interval -Derivability and continuity of afunction-MeanvalueTheorems-Rolle'sTheorem,Lagrange'sTheorem,Cauchy'sMeanvalueTheorem

Unit – 5RIEMANNINTEGRATION

RiemannIntegral-Riemannintegralfunctions-Darbouxtheorem-Necessaryandsufficientcondition for R integrability - Properties of integrable functions - Fundamental theorem ofintegralcalculus -integral as thelimitof asum -Meanvalue Theorems.

Activities

Seminar/Quiz/Assignments/ApplicationsofRealAnalysistoReallifeProblem/ProblemSolvingSessions.

TextBook

An Introduction to Real Analysis by Robert G.Bartle and Donlad R. Sherbert, John Wiley and sonsPvt.Ltd

ReferenceBooks

1. ElementsofRealAnalysisbyShanthiNarayanandDr.M.D.Raisinghania,S.Chand&CompanyPvt.Ltd., New Delhi.
2. PrinciplesofMathematicalAnalysisbyWalterRudin,McGraw-HillLtd.

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SEMESTER-IV

COURSE11:INTEGRALTRANSFORMSWITHAPPLICATIONS

Theory Credits:4 5 hrs/week

LearningOutcomes

Studentsaftersuccessfulcompletionofthecoursewillbeableto

1. understandtheapplicationof LaplacetransformstosolveODEs
2. understandtheapplicationof LaplacetransformstosolveSimultaneousDEs
3. understandtheapplicationofLaplacetransformstoIntegralequations
4. basicknowledgeofFourier-Transformations
5. ComprehendthepropertiesofFouriertransformsandsolveproblemsrelatedtofinite Fouriertransforms.

CourseContent

Unit– 1

Applicationof LaplaceTransformtosolutionsof DifferentialEquations

SolutionsofordinaryDifferentialEquations-SolutionsofDifferentialEquationswithconstantscoefficients-Solutions of DifferentialEquationswith Variable coefficients.

Unit– 2

Applicationof LaplaceTransformtosolutionsof DifferentialEquations

SolutionsofSimultaneousOrdinaryDifferentialequations-SolutionsofPartialDifferentialEquations.

Unit– 3

ApplicationofLaplaceTransformstoIntegral Equations

Definitions of Integral Equations - Abel's Integral Equation - Integral Equation of Convolution Type - IntegralDifferential Equations-Application ofL.T.toIntegral Equations.

Unit – 4FourierTransforms-I

Definition of Fourier Transform - Fourier sine Transform - Fourier cosine Transform - Linear Propertyof Fourier Transform - Change of Scale Property for Fourier Transform - sine Transform and cosinetransformshiftingproperty-Modulation theorem.

Unit– 5FourierTransforms–II

DefinitionofConvolution-ConvolutiontheoremforFouriertransform-Parseval'sIdentity-Relationship between Fourier and Laplace transforms - problems related to Integral Equations -FiniteFourier Transforms - Finite Fourier Sine Transform - Finite Fourier Cosine Transform - Inversionformulaforsineand cosinetransforms only-statement and related problems.

Activities

Seminar/Quiz/Assignments/ApplicationsofIntegralTransformsinreallifeproblems /ProblemSolvingSessions.

TextBook

B.S.Grewal, HigherEngineeringMathematics,KhannaPublishers,44thEdition,2017.

ReferenceBook

1. FourierSeriesandIntegralTransformationsbyDr.S.Sreenadhandothers, publishedbyS.ChandandCo, New Delhi
2. E.M.SteinandR.Shakarchi,Fourieranalysis:Anintroduction,(PrincetonUniversityPress,2003).
3. R.S.Strichartz,AguidetoDistributiontheoryandFouriertransforms,(Worldscientific,2003).

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SEMESTER-

VCOURSE12:LINEARALGEBRA

Theory Credits:4 5 hrs/week

CourseOutcomes

Aftersuccessful completionofthis course,the studentwill beable to

1. understandtheconceptsofvectorspaces,subspaces
2. understandtheconceptsofbasis,dimensionandtheirproperties
3. understandtheconceptoflineartransformationandits properties
4. applyCayley-Hamiltontheoremtoproblemsforfindingtheinverseofamatrixandhigherpowersofmatrices without usingroutine methods
5. learnthepropertiesofinnerproductspacesanddetermineorthogonalityininnerproductspaces.

CourseContent

UNIT– I

VectorSpaces-I

Vector Spaces - General properties of vector spaces - n-dimensional Vectors - addition and scalarmultiplication of Vectors - internal and external composition - Null space - Vector subspaces - Algebraof subspaces - Linear Sum of two subspaces - linear combination of Vectors- Linear span LinearindependenceandLineardependenceofVectors.

UNIT–II

VectorSpaces-II

Basis of Vector space - Finite dimensional Vector spaces - basis extension - co-ordinates- Dimension ofaVector space-Dimension ofasubspace -Quotient spaceandDimension of Quotient space.

UNIT–III

LinearTransformations

Linear transformations - linear operators- Properties ofL.T- sum and product of L.Ts - Algebra ofLinear Operators - Range and null space of linear transformation - Rank and Nullity of lineartransformations -Rank-NullityTheorem.

UNIT–IV

Matrices

Characteristicequation-CharacteristicValues-Characteristicvectorsofasquarematrix-CayleyHamiltonTheorem– problems on CayleyHamilton Theorem.

UNIT–V

Innerproductspace

Inner product spaces- Euclidean and unitary spaces- Norm or length of a Vector- Schwartz inequality- Triangle Inequality- Parallelogram law- Orthogonality- Orthonormal set- Problems on Gram–Schmidtorthogonalisationprocess-Bessel's inequality.

Activities:

Seminar/Quiz/Assignments/Applicationsof Linear Algebrainreallifeproblems\ProblemSolving.

TextBooks

1. LinearAlgebrabyJ.N.SharmaandA.R.Vasishtha,publishedbyKrishna PrakashanMedia(P)Ltd.
2. MatricesbyA.R.Vasishtha andA.K.Vasishtha published byKrishnaPrakashanMedia(P)Ltd.

ReferenceBooks

1. LinearAlgebrabyStephenH.Friedberget.al.publishedbyPrenticeHallofIndiaPvt.Ltd.4th Edition, 2007
2. LinearAlgebrabyKennethHoffmanandRayKunze,publishedbyPearsoneducationlowpricededition), New Delhi.
3. MatricesbyShantiNarayana, published byS.Chand Publications

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SEMESTER-V

COURSE13:VECTORCALCULUS

Theory Credits:4 5 hrs/week

CourseOutcomes

Studentsaftersuccessfulcompletionofthecoursewillbeableto

1. Learnmultipleintegralsasanaturalextensionofdefiniteintegraltoafu nctionoftwovariablesinthecaseofdoubleintegral/threevariablesinth ecaseoftripleintegral.
2. Learnapplicationsintermsoffindingsurfaceareabydoubleintegralandvolumebytripleintegral .
3. Determinethegradient,divergenceandcurlofavectorandvectoridentities.
4. Evaluateline,surfaceandvolumeintegrals.
5. understand relation between surface and volume integrals (Gauss divergencetheorem),relationbetweenlineintegralandvolumeintegral(Green'stheorem),relati onbetweenlineandsurfaceintegral(Stokestheorem)

CourseContent

Unit– 1MultipleIntegrals -I

Introduction-Doubleintegrals-Evaluationofdoubleintegrals–Propertiesofdoubleintegrals-Regionofintegration -doubleintegrationinPolarCo-ordinates – Changeofvariablesindoubleintegrals-changeoforderofintegration.

Unit– 2Multipleintegrals- II

Tripleintegral -regionofintegration -changeofvariables -Plane areasbydoubleintegrals - surfaceareabydoubleintegral-Volumeasadoubleintegral,volumeasatripleintegral.

Unit– 3Vectordifferentiation

Vectordifferentiation–ordinary-derivativesofvectors–Differentiability–Gradient–Divergence-Curloperators-Formulaeinvolvingtheseparators.

Unit– 4Vectorintegratio n

LineIntegralswithexamples-SurfaceIntegralwithexamples-Volumeintegralwithexamples.

Unit– 5Vectorintegrationapplications

Gausstheoremandapplicationsof Gausstheorem - Green'stheoreminplane andapplicationsofGreen'stheorem-Stokes'stheoremandapplicationsofStokestheorem.

Activities

Seminar/Quiz/Assignments/ApplicationsofVectorcalculustoReallifeProblems/ProblemSolvingSessions.

TextBook

AtextBookofHigher EngineeringMathematicsbyB.S.Grawal,Khanna Publishers,43rd Edition

ReferenceBooks

1. VectorCalculus byP.C.Matthews, SpringerVerlagpublications.
2. VectorAnalysis byMurraySpiegel,Schaum PublishingCompany,NewYork

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SEMESTER-V

COURSE14:FUNCTIONSOFACOMPLEXVARIABLE

Theory Credits:4 5 hrs/week

CourseOutcomes

Aftersuccessful completionofthis course,the studentwill beable to

1. determinea Bilineartransformationunder givencondition
2. knowaboutcontinuity,compactnessandconnectednessofsetsincomplexplane
3. knowthenecessarycondition and sufficient condition forf(z)to beanalytic
4. knowabouttheinverseofananalytic function
5. know about the convergence of sequences and thenecessary & sufficient condition for asequenceto beconvergent
6. knowthepowerseries expansion ofelementaryfunctions

CourseContent

Unit– 1

BilinearTransformations

Extended Complex Plane – Resultant and Inverse of a bilinear transformation – The linear group – Geometrical significance of the transformation. Angle preserving property of Bilinear Transformation– DeterminationofBilineartransformationsundergivencondition,somespecialbilineartransformations.

Unit – 2TopologicalConsiderations

Neighbourhood of a point – Interior, exterior and frontier points of a set,open and closed sets.Connected sets, Domains and continua - a theorem on Nests of closed Rectangular domains- BolzanoWeierstrass theorem- Hein-Borel theorem. Limits - algebraic operations with limits – continuity anduniform continuity – compactness – connectedness - Jordan curve theorem -connectedness of linesegments and polygonal lines.Branch line and Branch point - Characterisation of open connected setsbypolygonal lines.

Unit – 3Analyticfunctions

Differentiable functions of a complex variable - Geometrical representation of a variable - Analyticfunction- Elementary rules and chain rule - Derivatives of polynomials and rational functions - Thenecessary condition and sufficient condition for $f(z)$to be analytic -Analytic functions in a Domain –Derivativeofw in polarform-Construction of $f(z)$.

Unit– 4

Inverseof an analyticfunctionandinfiniteseries

The inverse of an analytic function – neighbourhood preserving mappings -Domain preserving andanglepreservingpropertyofanalyticmappings.

Convergent sequences, necessary and sufficient condition for a sequence to be convergent, Cauchysequence,Convergenceofinfiniteseries.Cauchygeneralprincipleofconvergenceforaseries.Absolute convergence of a series.Abel's and Dirichilet's tests. Rearrangement of series, product ofseries.

Unit – 5PowerSeries

Powerseries-exponential,trigonometricandhyperbolicfunctions-zerosof$sinz,cosz$-periodsof $sinz,cosz,E(z)$-Alawoflogarithms-Analyticcharacterof$logz$-generalizeda^b-Analyticcharacterofz^n-$\mathrm{Cos}^{-1}z$,$\mathrm{Sin}^{-1}z$andderivativesof$\mathrm{Cos}^{-1}z$,$\mathrm{Sin}^{-1}z$.

Activities

Seminar/Quiz/Assignments/ApplicationsofFunctionsofcomplexvariablestoReallifeProblem /ProblemSolvingSessions.

TextBook

Theory of Functions of a Complex variable by Shanti Narayan &Dr. P. K. Mittal, S. Chand&CompanyLtd.

ReferenceBooks

1. Theory of Functions of a Complex Variable by A. I. Markushevich, Second Edition, AMSChelseaPublishing
2. TheoryAndApplicationsbyM.S.Kasara,ComplexVariables,2ndEdition,PrenticeHallIndiaLearning PrivateLimited

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SEMESTER-V

COURSE14:ADVANCEDNUMERICALMETHODS

Theory Credits:4 5hrs/week

CourseOutcomes

Aftersuccessful completionofthis course,the studentwill beable to

1. findderivativesusingvariousdifferenceformulae
2. understandtheprocessofNumericalIntegration
3. solveSimultaneousLinearsystemsofEquations
4. understand Iterativemethods
5. findNumerical Solutionof OrdinaryDifferential Equations

CourseContent

UNIT– I

NumericalDifferentiation

Derivatives using Newton's forward difference formula - Newton's backward difference formula- Derivatives using central difference formula - Stirling's interpolation formula - Newton's divideddifference formula.

UNIT– II

NumericalIntegration

General quadrature formula on errors - Trapezoidal rule – Simpson's 1/3rule - Simpson's 3/8rule- Weddle'srule-Euler-Maclaurin formulaof summation andquadrature- TheEulertransformation.

UNIT– III

SolutionofSimultaneousLinearsystemsofEquations–I

Solution of linear systems - Direct Methods - Matrix inversion method – Gaussian elimination method- GaussJordan Method.

UNIT– IV

SolutionofSimultaneousLinearsystemsofEquations–II

Method of factorization - solution of Tridiagonal systems - Iterative methods - Jacobi's method - Gauss -Siedal method.

UNIT– V

NumericalSolutionofOrdinaryDifferentialEquations

Introduction – solution ofTaylor's series – Picard's method of successive approximations – Euler'smethod–Modified Euler's method– Runge-Kuttamethods.

Activities

Seminar/Quiz/Assignments/ApplicationsofNumericalmethodstoReallifeProblem /ProblemSolvingSessions.

TextBook

NumericalAnalysisbyG.ShankerRao,NewAgeInternationalPublications

ReferenceBooks

1. AppliedNumericalAnalysisbyCurtisF.GeraldandPatrickO.Wheatley,PearsonPublications.
2. NumericalMethodsfor Scientific andEngineeringComputationbyM.K. Jain,S.R.K.Iyengarand R.K.Jain,NewAgeInternationalPublishers.

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SEMESTER-V

COURSE15:NUMBERTHEORY

Theory Credits:4 5hrs/week

LearningOutcomes

Aftersuccessfulcompletion ofthecourse,students willbeableto

1. understandthefundamentaltheoremofarithmetic
2. understandMobiusfunction,Eulerquotientfunction,TheMangoldtfunction,Liouville'sfunctio n, The divisor functions and thegeneralized convolutions.
3. understandEuler'ssummationformula,applicationtothedistributionoflatticepointsandtheappl ications to μ (n)and Λ (n)
4. understandtheconceptsofcongruencies,residueclassesandcompleteresiduessystems.
5. Comprehendtheconceptofquadraticresiduesmod pandquadraticnonresiduesmodp.

UNIT-I

TheFundamentTheoremof Arithmetic

Introduction, Divisibility, Greatest common divisor, Prime numbers, The fundamental theorem ofarithmetic, The series of reciprocals of the primes, The Euclidean algorithm, The greatest commondivisorofmorethan twonumbers

UNIT-II

ArithmeticalFunctionsAndDirichletMultiplication

Introduction- The Mobius function $\mu(n)$ – The Euler quotient function $\varphi(n)$ - A relation connectingφ and μ - A product formula for $\varphi(n)$ - The Dirichlet product of arithmetical functions-DirichletinversesandtheMobiusinversionformula-TheMangoldtfunction $\Lambda(n)$-multiplicativefunctions-multiplicativefunctionsandDirichletmultiplication-Theinverseofacompletelymultiplicativefunction-Liouville's function$\lambda(n)$-The divisorfunctions$\sigma_\alpha(n)$

UNIT-III

AveragesOfArithmeticalFunctions

Introduction- The big oh notation. Asymptotic equality of functions- Euler's summation formula-Some elementary asymptotic formulas-The average order of $d(n)$- The average order of the divisorfunctions $\sigma_\alpha(n)$- The average order of $\varphi(n)$- An application to the distribution of lattice pointsvisible from the origin- The average order of $\mu(n)$ and $\Lambda(n)$-The partial sums of a Dirichlet product-Applications to $\mu(n)$and $\Lambda(n)$

UNIT-IV

Congruences

Definition and basic properties of congruences- Residue classes and complete residue systems-Linear congruences- Reduced residue systems and the Euler- Fermat theorem-Polynomialcongruences modulo p. Lagrange's theorem- Applications of Lagrange's theorem-Simultaneouslinearcongruences.The Chineseremaindertheorem-Applicationsofthe Chineseremaindertheorem

UNIT-V

QuadraticResiduesandtheQuadraticReciprocityLaw

Quadratic Residues, Legendre's symbol and its properties, Evaluation of $(-1/p)$ and $(2/p)$, Gausslemma, The Quadratic reciprocity law, Applicationsof the reciprocity law, The JacobiSymbol,Gauss sums and the quadratic reciprocity law, the reciprocity law for quadratic Gauss sums, Anotherproofof thequadraticreciprocitylaw.

Activities

Seminar/ Quiz/ Assignments/ Applications of Number theory to Real life Problem /ProblemSolvingSessions

TextBook

Introduction to Analytic Number Theory by T.M.Apostol, Springer Verlag-New York, Heidalberg-Berlin-1976.

ReferenceBooks

1. ElementaryNumber TheorybyG.A.Jones andJ.M.Jones, , Springer
2. ElementaryNumber TheorybyDavid, M. Burton, 2nd Edition UBS Publishers.
3. Number TheorybyHardy&Wright,Oxford Univ.,Press.
4. Elements of theTheoryof Numbers byDence, J. B&DenceT.P, AcademicPress

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SEMESTER-V

COURSE15:MATHEMATICALSTATISTICS

Theory Credits:4 5 hrs/week

CourseOutcomes

Aftercompletionofthe course, studentwillbe ableto

1. understandtheprobabilityset function and conditional probability
2. understandaboutrandomvariables,discreteandcontinuoustypedistributions
3. understandthedistribution oftwo randomvariables andexpectation ofarandomvariables
4. knowbinomialand relateddistributions
5. normaldistributionsand theapplicationsof normaldistributions

Unit – 1ProbabilityandDistributions

Sets–setfunctions–Theprobabilitysetfunction– countingrules– additionalpropertiesofprobability- conditional probabilityand independence-simulations

Unit– 2 ProbabilityandDistributionscontinued..

Random Variables - Discrete Random Variables - Continuous Random Variables-Quantiles-Transformations-Mixtures of Discrete andContinuous TypeDistributions
Expectation of a Random Variable - Computation for an Estimation of the Expected Gain - SomeSpecialExpectations-ImportantInequalities

Unit – 3MultivariateDistributions

Distributions of Two Random Variables - Marginal Distributions - Expectation – TransformationsBivariate Random Variables- Conditional Distributions and Expectations-Independent RandomVariables-TheCorrelationCoefficient-Extensionto Several RandomVariables
Multivariate Variance-Covariance Matrix-Transformations for Several Random Variables - LinearcombinationsofRandom Variables

Unit– 4 SomeSpecialDistributions

TheBinomialandRelatedDistributions-NegativeBinomialandGeometricDistributions-multinomial Distribution- Hypergeometric Distribution - The Poisson Distribution - The Γ, $\chi^2$and βDistributions - Theχ^2-Distribution-Theβ-Distribution

Unit – 5NormalDistribution

The Normal Distribution. - Contaminated Normals - The Multivariate Normal Distribution - BivariateNormal Distribution - Multivariate - Normal Distribution. General Case-Applications -t- and F-Distribution

Activities

Seminar/Quiz/Assignments/ApplicationsofMathematicalstatisticstoReallifeProblem /ProblemSolvingSessions.

TextBook

Introduction to Mathematical Statistics by Robert V Hogg, Joseph W MacKeen, EighthEdition,Allen TCraig, Pearson

ReferenceBooks

1. FundamentalsofStatisticsbyGoonA.M.,GuptaM.K.andDasguptaB.,(2002)Vol.I &II,8thEdn. TheWorld Press, Kolkata.
2. FundamentalsOfMathematicalStatisticsbyGupta,S.C.andKapoor,V.K.(2008):4thEdition(Reprint), Sultan Chand &Sons
3. MathematicalStatisticswithApplicationsbyMiller,IrwinandMiller,Marylees(2006)JohnE.Freund's,(7th Edn.), Pearson Education, Asia.
4. IntroductiontotheTheoryofStatisticsbyMood,A.M.Graybill,F.A.andBoes,D.C.,(2007),3rdEdn., (Reprint), Tata McGraw-Hill Pub. Co.Ltd.

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SEMESTER-VII

COURSE16:ALGEBRA

Theory Credits:4 5hrs/week

LearningOutcomes

Aftersuccessfulcompletion ofthe course,students willbeableto

1. understandthedirect productofgroups andapplicationofSylow'stheorems
2. understandthehomomorphicrelation betweenthe groups, sumanddirect sumofideals
3. knowfactorizingthedomainsandfactorizationofpolynomials
4. knowaboutsubmodulesanddirectsums
5. aboutFreemodulesandRepresentationoflinear mappings

UNIT-I
Structuretheoremsofgroups

Directproducts-Finitelygeneratedabeliangroups-Invariantsofafiniteabeliangroup-Sylowtheorems.(Sections8.1 to 8.4 ofthe Chapter8 in thePrescribed TextBook.)

UNIT-II
IdealsandHomomorphisms

Ideals-Homomorphisms-Sumsanddirectsumsofideals-Maximalandprimeideals-Nilpotentandnilideals-Zorn'slemma.(Sections 10.1to10.6 oftheChapter10in thePrescribed TextBook.)

UNIT-III
UniquefactorizationdomainsandEuclideandomains

Uniquefactorizationdomains-Principalidealdomains-Euclideandomains-PolynomialringsoverUFD(Sections11.1 to 11.4 ofthe Chapter11 in thePrescribed Text Book.)

UNITIV
Modulesand VectorSpaces

Definitionandexamples–Submodulesanddirectsums–R-homomorphismsandquotientmodules(Sections 1,2&3 ofChapter -14)

UNITV
FreeModules

Completelyreduciblemodules–Freemodules–Representationoflinearmappings–Rankoflinearmapping(Sections4 to 7 ofChapter -14)

Activities

Seminar/Quiz/Assignments/ApplicationsofAlgebratoReallifeProblem/ProblemSolving

TextBook

BasicAbstractAlgebrabyP.B.Battacharya,S.K.jain,S.R.Nagpaul,Cambridge UniversityPress.

ReferenceBook

1. TopicsinAlgebrabyI.N.Herstein,2nd Edition,JohnWiley&Sons
2. AlgebrabySergeLang,RevisedThirdEdition,Springer
3. AlgebrabyThomasW.Hungerford,Springer

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SEMESTER-VII

COURSE16:CLASSICALMECHANICS

Theory Credits:4 5hrs/week

LearningOutcomes

Aftersuccessfulcompletion ofthe course,students willbeableto

1. identifythebasicconceptsofmechanicsandalsolearnapplicationsof Lagrangianformulation.
2. UnderstandderivationofLagrange'sequationsfromHamilton'sprincipleandadvantagesofvariationalprincipleformulation
3. Understandthesimplisticapproachtocanonicaltransformations,
4. UnderstandPoissonand Lagrangebracketsandtheirinvarianceandthe HamiltonJacobiEquationsforHamilton'sprincipal function
5. Understandspecialtheoryofrelativity,Lorentztransformationandcontractionsand Lorentztransformations

Unit-IILagrangianFormulation

Mechanics of a particle, mechanics of a system of particles, constraints, generalized coordinatesgeneralized velocity, generalized force and potential.D'Alembert'sprinciple and Lagrange'sequations, some applications ofLagrangian formulation (scope and treatment as in Art.1.1 to 1.4 andArt1.6 of Text book.1).

Unit-II Hamilton'sprincipleto non-holonomicsystems

Hamilton's principle, derivation of Lagrange's equations from Hamilton's principle, extension ofHamilton's principle to non-holonomic systems, advantages of variational principle formulation,conservationtheoremsand symmetryproperties(scopeandtreatment asinArt 2.1and2.3 to2.6ofText book.1).

Unit-IIIHamiltonianformulation

Legendre transformations and the Hamilton equations of motion, cyclic coordinates and conservationtheorems,derivationofHamilton'sequationsfromavibrationalprinciple,theprincipleofleastaction,the equation of canonical transformation, examples of canonical transformation, the HarmonicOscillator, the simplistic approach to canonical transformations (scope and treatment as inArt.8.1,8.2,8.5,8.6 and 9.1 to 9.4 of Text book.1).

Unit-IVCanonicaltransformations

Poisson and Lagrange brackets and their invariance under canonical transformation.Jacobi's identity;Poisson'sTheorem.EquationsofmotioninfinitesimalcanonicaltransformationinthePoissonbracketformulation.Hamilton Jacobi Equations for Hamilton's principal function, The harmonic oscillatorproblem as an example of the Hamilton – Jacobi method, the Hamilton – Jacobi equation forHamilton's characteristic function (scope and treatment as in Art 9.5, 9.6, 10.1, 10.2 and 10.3 of Textbook.1)

Unit-V
Lorentztransformation equations

New concept of space and Time, postulates of special theory of relativity, Lorentz transformationequations, Lorentz contraction, Time dilation, simultaneity, Relativistic formulae for composition ofvelocities and accelerations, proper time, Lorentz transformations form a group (scopeand treatmentasin chapters 1and 2 ofText book.2).

Activities

Seminar/Quiz/Assignments/ApplicationsofClassicalMechanicstoReallifeProblem/ProblemSolvin
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Textbooks

1. Classical mechanics byH.Goldstein, 2nd edition,NarosaPublishingHouse.
2. RelevanttopicsfromSpecialrelativitybyW.Rindler, Oliver & Boyd,1960.

ReferenceBook

ClassicalMechanicsbyJ.C.Upadhyaya,HimalayaPublishingHouse

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SEMESTER-VII

COURSE17:REAL ANALYSIS

Theory Credits:4 5 hrs/week

LearningOutcomes

Aftersuccessfulcompletion ofthe course,students willbeableto

1. understand to forma metricspacefrom anynon-emptyset,compactsetsand connected sets
2. understandcontinuityof functions, compactnessandconnectedness
3. knowthederivativeofarealvaluedfunctionandtheapplicationsofMeanvaluetheorems
4. knowtheconditionsforexistenceof integralsand someapplicationsofintegrals
5. knowthevectorvaluedfunctions,differentiationandintegrationofvectorvaluedfunctionsandtheirapplications

UNITI

Basic Topology

Finite,countableanduncountablesets–Metricspaces–Compactsets–Perfectsets–Connectedsets(Sections2.1 to 2.47)

UNITII

Continuity

Limitsoffunctions-Continuousfunctions–ContinuityandCompactness–ContinuityandConnectedness – Discontinuities.Monotonic functions (Sections 4.1 to 4.31)

UNITIII

Differentiation

Thederivative of a realfunction–MeanValue Theorems–ThecontinuityofDerivativesL'Hospital'sRule.(Sections 5.1 to 5.13)

UNITIV

RiemannStieltjesIntegrals

Definitionandexistence ofintegral–propertiesof integrals–.(Sections6.1to6.19)

UNITV

FTCandVectorValuedFunctions

Integrationanddifferentiation-DifferentiationofVectorValuedFunctions–IntegrationofVectorvaluedfunctions – Rectifiablecurves.(Sections 6.20 to 6.27)
(FTC:FundamentalTheoremofCalculus)

Activities

Seminar/Quiz/Assignments/ApplicationsofRealAnalysistoReallifeProblem/ProblemSolving

TextBook

PrinciplesofMathematicalAnalysisbyWalterRudin,McGrawHillInternationalEdition

ReferenceBook

MathematicalAnalysisbySCMalik,SavitaAroraNew ageInternationalPublishers

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SEMESTER-VII

COURSE17:DISCRETEMATHEMATICS

Theory Credits:4 5 hrs/week

LearningOutcomes

Aftersuccessfulcompletion ofthe course,students willbeableto

1. learntheapplications of graph theoryin othersubjects.
2. understandrepresentationsof differentproblemsbymeansof graphs.
3. learntherelationbetweenbipartitegraphsandodd cycles.
4. learntheconceptsofforest, binarytrees, eccentricityof avertexand radiusofconnectedgraphs.
5. learntheimportanceof multigraphsinothersubjectslikephysicsandchemistry.
6. learndifferentcharacterizationsofmodularanddistributivelattices.

UNIT-I

Basic Ideas, History, Initial Concepts, Summary, Connectivity , Elementary Results, Structure Basedon Connectivity(Chapters– 1 &2 ofText Book 1)

Unit–II

Trees,Characterizations,TheoremsonTrees,TreeDistances,Binarytrees,TreeEnumeration,Spanningtrees, Fundamental Cycles, Summary(Chapter– 3 of Text Book 1)

Unit– III

Traversability,Introduction,EulerianGraphs,HamiltonianGraphs,MinimalSpanningTrees,J.B.Kruskal's Algorithm, R.C.Prim's Algorithm. (Chapter 4 of Text Book 1 and Section 7.5 of TextBook2)

Unit–IV

PosetDefinition,PropertiesofPosets,LatticeDefinition,Propertiesof Lattices(Chapter1-A of Text Book 3)

Unit –

VDefinitionsofModularandDistributiveLattices anditsProperties(Chapter1-Bof Text Book 3)

Activities

Seminar/Quiz/Assignments/ApplicationsofDiscreteMathematicstoReallifeProblem/ProblemSolving

Textbooks

1. GraphTheoryApplications byL.R.Foulds, NarosaPublishingHouse,New Delhi.
2. DiscreteMathematicalStructuresbyKolmanandBusbyandSharenRoss,PrenticHallofIndia– 2000, 3rdEdition
3. AppliedAbstract AlgebrabyRudolfLidland GunterPilz, PublishedbySpringer-Verlag.

ReferenceBook

AtextBookofDiscrete MathematicsbyHarishMittal, VinayKumarGoyal,DeepakKumar Goyal,IKInternationalPublishing HousePvt.Ltd, New Delhi.

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SEMESTER-

VIICOURSE18:BASICTOPOLOG

Y

Theory Credits:4 5 hrs/week

LearningOutcomes

Aftersuccessfulcompletionofthecourse,studentswillbeableto

1. handleoperationsonsetsandfunctionsandtheir properties
2. understandtheconceptsofMetricspaces,opensets,closedsets,convergence,someimportanttheorems likeCantor's intersection theoremandBaire's theorem
3. familiarwiththeconceptofTopologicalspaces,continuousfunctionsinmoregeneralandcharacterizecontinuous functions interms of opensets,closed sets etc.
4. explaintheconceptof compactnessintopologicalspacescharacterize compactnessinmetricspaces and theirproperties.

UNITI

SetsandFunctions

Sets and Set inclusion – The algebra of sets – Functions – Products of sets – Partitions and equivalencerelations – Countable sets – Uncountable sets – Partially ordered sets and lattices. (Chapter I: Sections1 to 8 of theprescribed text book).

UNIT-II

Metricspaces

Thedefinitionandsome examples–Opensets–Closedsets – Convergence,CompletenessandBaire'stheorem . (Chapter 2: Sections 9to 12 ofthe prescribedtext book).

UNIT-III

Metricspaces

Continuous mappings, Spaces of continuous functions – Euclidean and Unitary spaces.(Chapter 2:Sections 13 to15 of the prescribed text book) Topological spaces: The definition and some examples –Elementaryconcepts– (Chapter3: Sections 16 to 17 ofthe prescribed text book).

UNIT-IV

Topologicalspaces

Open bases and open sub bases, Weak Topologies, The function algebras C(X, R) and C(X, C).(Chapter 3: Sections 18 to 20 of the prescribed text book). Compactness: Compact spaces – Heine –Boreltheorem (Chapter4: Section 21).

UNIT-V

Compactness

ProductofSpaces–Tychonoff'stheoremandlocallyCompactspaces–Compactnessformetricspaces–Ascoli's theorem. (Chapter4: Sections 22 to 25ofthe prescribedtext book).

Activities

Seminar/Quiz/Assignments/Applicationsof TopologytoReallifeProblem/ProblemSolving

TextBook

Introduction toTopologyandModern AnalysisbyG. F.SimmonsInternationalStudentedition –McGraw– Hill Ltd.

ReferenceBooks

1. Schaum'sOutlines:General TopologybySeymour Lipschutz
2. Topology: Afirst CoursebyJames Munkres

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SEMESTER-VII

COURSE18:CRYPTOGRAPHY

Theory Credits:4 5hrs/week

LearningOutcomes

Aftersuccessfulcompletion thiscourse, thestudent willbe ableto

1. understandDivisibilityandEuclideanalgorithmand congruences
2. understandaboutEncipheringmatrices
3. understandfinitefieldsandquadraticresidues
4. understandthe ideaof publickeycryptography
5. understandpseudo-primesandFermat'sfactorization

UNIT-I
ElementaryNumberTheory

TimeEstimatesfor doingarithmetic-DivisibilityandEuclideanalgorithm-Congruences-Applicationsto factoring(Chapter-Iof theText Book)

UNIT-II
Cryptography

Somesimple cryptosystems-Encipheringmatrices (Chapter-IIIoftheText Book)

UNIT-III
FiniteFieldsandquadraticResidues

Finitefields -Quadraticresidues andReciprocity(Chapter-IIof theTextBook)

UNIT-IV
PublicKey Cryptography

Theideaof publickeycryptography-RSA-Discrete log-Knapsack(Chapter-IV : SectionsIV.1to IV.4(omit sec.5)oftheText Book)

UNIT-V
PrimalityandFactoring

Pseudoprimes-Therho method-Fermatfactorizationandfactorbases- TheContinuedfractionmethod -Thequadraticsievemethod(Chapter-VoftheText Book)

Activities

Seminar/Quiz/ Assignments/ ApplicationsofCryptographytoReal lifeProblem/Problem Solving

TextBook

ACoursein NumberTheoryand CryptographybyNeal Koblitz,Springer-Verlag, New York,2002,SecondEdition.

ReferenceBooks

1. An Introduction to TheoryofNumbers byNiven and Zuckermann,Edn.3, WileyEasternLtd.,NewDelhi,1976.
2. ElementaryNumber TheorybyDavidM.Burton, Wm C.BrownPublishers, Dubuque,Iowa, 1989.
3. AClassicalIntroductiontoModernNumberTheorybyK.Ireland and M.Rosen,Springer Verlag,1972.

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SEMESTER-VII

COURSE19:LATTICETHEORY&BOOLEANALGEBRA

Theory Credits:4 5hrs/week

LearningOutcomes

Aftersuccessfulcompletion of the course,students willbeableto

1. understandtheconceptofpartiallyorderedset andpropertiesofpartialorderedsets
2. understandtheconceptoflattice,semilatticeandtheirproperties
3. understandtheconceptofidealsand homomorphismsinlattices
4. understandthedistributiveandthe modularlattices
5. understandtheconcept ofBooleanalgebraand propertiesof Boolean algebra

UNIT-I

PartlyOrderedSets

Set Theoretical Notations, Relations, partly ordered Sets, Diagrams, special Subsets of a Partlyorderedset, length, Lower and Upper Bounds, The minimum and maximum condition.(Chapter 1,section 1 to 8oftheText Book)

UNIT–II

LatticesinGeneral

Algebras,lattices,TheLatticeTheoreticalDualityprinciple,semiLattices,latticesasPartlyorderedsets, Diagrams of lattices, Sub lattices, Ideals, Bound Elements of a lattice, Atoms and DualAtoms,Complements, Relative Complements, Semi complements, Irreducible Prime Elements of alattice,TheHomomorphism of alattice(Chapter 2, section 10-20 ofthe Text Book)

UNIT– III

Completelattices

Completelattices,CompleteSublatticesofaCompletelattice,ConditionallyCompleteLattices,CompactElements,CompactlyGeneratedlattices,SubalgebralatticeofanAlgebra,ClosureOperations(Chapter3, Sections 22-27 oftheText Book)

UNIT– IV

DistributiveandModularLattices

Distributivelattices,InfinitelyDistributiveandCompletelyDistributivelattices,Modularlattices,CharacterizationofModularandDistributivelatticesbytheirSublattices,DistributiveSublatticesofModularLattices,Isomorphismtheoremsofmodularlattice,Meetrepresentationinmodularanddistributive lattices(Chapter 4 of theText Book)

UNIT– V

Booleanalgebras

Booleanalgebras,DeMorganformulae,CompleteBooleanalgebras,BooleanalgebrasandBooleanrings,Thealgebraofrelations,ThelatticeofPropositions,ValuationsofBooleanalgebras(Chapter6 oftheText Book)

Activities

Seminar/Quiz/Assignments/ApplicationsofLatticeTheoryandBooleanAlgebratoReallifeProblem/Problem Solving.

TextBook

Introductionto LatticeTheory,GaborSzasz,Academicpress

ReferenceBooks

1. LatticeTheorybyG. Birkhoff, Amer.Math. Soc.
2. General LatticeTheorybyGeorge Grätzer, BirkhäuserBasel(1978)

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SEMESTER-VII

COURSE19:FINITEELEMENTANALYSIS

Theory Credits:4 5 hrs/week

LearningOutcomes

Aftersuccessful completionofthe course,students will beable to

1. understandtheconceptsbehindformulationmethodsinFEM.
2. identifytheapplicationandcharacteristicsofFEAelementssuchasbars,beams,planeandiso-parametricelements.
3. developelementcharacteristicequationand generationof global equation.
4. apply suitable boundary conditions to a global equation for bars, trusses, beams, circular shafts,heat transfer, fluid flow, axisymmetric and dynamic problems and solve them displacements,stressand strains induced.
5. KnowtheFiniteelementmodeling,stresscalculationandtemperatureeffects

Unit - IFundamentalConcepts

Introduction, Historical background, Outline of presentation, Stresses and Equilibrium, Boundaryconditions, Strain-Displacement relations, Stress-Strain relations, Plane stress, Plane strain problems,Temperatureeffects,Potentialenergyandequilibrium.TheRayleigh-Ritzmethod,Hamilton'sprinciple.Galerkin'smethod,Saint Venant'sprinciple.(Chapter1,Section 1.1.to Section1.11)

Unit-II

One-dimensionalProblems

Introduction,FiniteElementModeling:Element Division,NumberingScheme, Coordinates and Shape Functions, The Potential Energy Approach: Element Stiffness Matrix, ForceTermsTheGalerkinApproach:ElementStiffness,ForceTerms,Assembly oftheglobalstiffnessmatrixand load vector. (Chapter3, Section 3.1 to 3.6)

Unit– III

One-dimensionalProblems(Continued)

Properties of K, The Finite Element Equations: Treatment of boundary conditions: Types of BoundaryConditions-ElimitwtionApproach,PenaltyApproach,MultipointConstraintsQuadraticshapefunctions,Temperatureeffects,Input data file.(Chapter3, Section 3.7 to3.10)

Unit - IVTrusses

Introduction, Plane trusses -Local and Global Coordinate Systems, Formulas for Calculating l and m,ElementStiffnessMatrix,StressCalculations,TemperatureEffects,Three-dimensionaltrusses,Assembly of global stiffness matrix for the Banded and Skyline solutions - Assembly for BandedSolution,Input DataFile(Chapter4)

Unit-V

Two-dimensionalProblems

Introduction, Finite element modeling, Constant strain triangle - lsoparametric Representation,Potential·EnergyApproach,ElementStiffness,ForceTerms,GalerkinApproach,StressCalculations,TemperatureEffects (Chapter5, Section 5.1 to 5.3)

Activities

Seminar/Quiz/Assignments/ApplicationsofFiniteElementAnalysistoReallifeProblem/ProblemSolving.

TextBook

IntroductiontoFiniteElementsinEngineeringbyTirupathiR.Chandrupatla,AshokD.Belegundu(chapters1 to 8 only).

ReferenceBooks

1. IntroductiontoFiniteElement Method,byS.S.Rao,Elsevier
2. FiniteElementMethodbyO.C. Zienkiewicz,Butterworth-Heinemann Ltd.
3. IntroductiontoFiniteElementMethodbyJ.N.Reddy,McGraw HillEducation

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SEMESTER-

VIICOURSE20:GRAPHTHEOR

Y

Theory Credits:4 5 hrs/week

LearningOutcomes

Aftersuccessfulcompletionofthecourse,studentswillbeableto1.Befami
liar withthe definitionsand basictheoryofgraphs

2. Beabletoimplementstandardalgorithmsof graph theory

3. Be able to prove simple results in graph
theory.4.Identifytrees
andobtainspanningtreesofgraphs.

5. FindEulerandHamiltonianpathsandcircuitsinagraph

UNITI

AnIntroductiontoGraph

TheDefinitionofaGraph,GraphasModels,MoreDefinitions,VertexDegrees,Subgraphs.(Chapter1,Secti
on 1.1 to 1.5 of theText Book)

UNITII

MatrixRepresentationofgraphs

Pathsandcycles,TheMatrixRepresentationofgraphs,Fusion(Chapter1, Section1.6to1.8)Trees
and Connectivity: Definitions and Simple Properties, Bridges, Spanning Trees(Chapter2,
Section 2.1 to 2.3 ofthe Text Book)

UNITIII

TreesandConnectivity(Continuity)

ConnectorProblems,ShortestPathProblems,CutVerticesandConnectivity(Chapter2,Section2.4to2.6
of theText Book)

UNITIV

EulerToursandHamiltonianCycles

Euler Tours, The Chinses Postman Problem, Hamiltonian Graphs, The Travelling Sallesman
Problem.(Chapter3ofthe Text Book)

UNITV

Matchings

MatchingandAugmentingpaths;Themarriageproblem; Thepersonnel
assignmentproblem;TheoptimalAssignment problem. (Chapter4 ofthe Text Book)

Activities

Seminar/Quiz/Assignments/ApplicationsofGraphTheorytoReallifeProblem/ProblemSolving

TextBook

Afirstlook atGraph TheorybyJohnClark &Derek AllanHolton,Allied Publishers Limited1995.

ReferenceBooks

1. AFirstCourseinGraphTheorybyS.A.Choudham,MacmillanIndiaLtd.

2. IntroductiontoGraphTheorybyRobinJ.Wilson,LongmanGroupLtd.
3. GraphTheorywithApplicationsbyJ.A.BondyandU.S.R.Murthy,Macmillon,London

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SEMESTER-VII

COURSE20:MATHEMATICALFINANCE

Theory Credits:4 5 hrs/week

LearningOutcomes

Uponsuccessfulcompletionofthiscoursestudentshould beableto:

1. Understandthethatinterest calculationsandmethodsofcalculations
2. Understandthe annuitiesandtypesofAnnuitiesandcalculationinterestandvaluesofannuities
3. UnderstandtheconceptofMathematicsofCapitalBudgetingandDepreciationandsomemethodsofcalculations
4. knowtheComparisonontheDiscountRatetothe InterestRate
5. knowthenet present value,profitabilityindex and othercapitalbudgetingmethods

UNIT–I

Mathematicsof theTimeValueof Money

Simple Interest : TotalInterest, Rate of Interest,Term of Maturity, Current Value, Future Value, Finding nand r When the Current and Future Values are Both Known, Simple Discount, Calculating the Term in Days,Ordinary Interest and Exact Interest, Obtaining Ordinary Interest and Exact Interest in Terms of Each Other,Focal Date and Equation of Value,Equivalent Time: Finding an Average due Date, Partial Payments, Findingthe Simple Interest Rate by the Dollar-Weighted Method(Unit – II section 1.1 to 1.14 of the text book)BankInterest: Finding FV Using the Discount Formula, Finding the Discount Term and the Discount Rate,Difference BetweenaSimple Discountand a Bank Discount(Unit–IIsection 2.1to 2.3of thetext book)

UNIT-II

Mathematicsof theTimeValueof Money(Continued)

BankInterest:ComparingtheDiscountRatetotheInterestRate,DiscountingaPromissoryNote,DiscountingaTreasuryBill(Unit–IIsection2.4to2.6ofthetextbook)CompoundInterest:TheCompounding Formula, Finding the Current Value, Discount Factor, Finding the Rate of Compound Interest,FindingtheCompoundingTerm,TheRuleof72andOtherRules,EffectiveInterestRate,TypesofCompounding, Continuous Compounding, Equations of Value for a Compound Interest, Equated Time For aCompoundInterest(Unit–IIsection 3.1 to 3.11 ofthe textbook)

UNIT-III

Mathematicsof theTimeValueof Money(Continued)

Annuities: Types of Annuities, Future Value of an Ordinary Annuity, Current Value of an Ordinary Annuity,Finding the Payment of an Ordinary Annuity, Finding the Term of an Ordinary Annuity,Finding the InterestRate of an Ordinary Annuity,Annuity Due: Future and Current Values,Finding the Payment of an AnnuityDue, Finding the Term of an Annuity Due,Deferred Annuity,Future and Current Values of a DeferredAnnuity,Perpetuities(Unit–IIsection 4.1 to 4.12 ofthetext book)

MATHEMATICS OF DEBT AND LEASING :Credit and Loans :Types of Debt, Dynamics of Interest–Principal Proportions, Premature Payoff, Assessing Interest and Structuring Payments, Cost of Credit, FinanceChargeandAverageDailyBalance, CreditLimit vs.DebtLimit(Unit–IIIsection1.1to 1.7of thetext book)

UNIT-IV

Mathematicsofdebitandleasing(Continued)

MortgageDebt: AnalysisofAmortization,EffectsofInterestRate,Term,andDownPaymentontheMonthly Payment, Graduated Payment Mortgage, Mortgage Points and the Effective Rate, Assuming aMortgageLoan,PrepaymentPenaltyonaMortgageLoan,RefinancingaMortgageLoan,Wraparoundand

BalloonPaymentLoans,SinkingFunds,ComparingAmortizationtoSinkingFundMethodsLimit(Unit–IIIsection 2.1to 2.10 of thetext book)

UNIT– V

MathematicsofCapitalBudgetingandDepreciation

CapitalBudgeting: NetPresentValue,InternalRateofReturn,ProfitabilityIndex,CapitalizationandCapitalizedCost, Other Capital BudgetingMethods

DepreciationandDepletion: TheStraight-LineMethod,TheFixed-ProportionMethod,TheSum-of-DigitsMethod,TheAmortization Method, TheSinkingFund Method

Limit (Unit –IVsection 1.1to 1.5and2.1 to2.5 ofthe textbook)

Activities

Seminar/Quiz/Assignments/ApplicationsofMathematicalFinancetoReallifeProblem/ProblemSolving

TextBook

MathematicalFinancebyM. J.Alhabeeb, A JohnWiley&Sons,INC., Publication

ReferenceBooks

1. InvestmentSciencebyDavidG.Luenberger,OxfordUniversityPress,Delhi,1998.
2. Futures and Other Derivatives by John C. Hull, Options, 6th Ed., Prentice-Hall India, Indianreprint,2006.
3. An Elementary Introduction to Mathematical Finance by Sheldon Ross, 2nd Ed.,CambridgeUniversityPress, USA, 2003

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SEMESTER-VIII

COURSE21:ADVANCEDALGEBRA

Theory Credits:4 5 hrs/week

LearningOutcomes

Aftersuccessfulcompletion thiscourse, thestudent willbe ableto

1. definemodules,submodulesandgive someexamplesofthem.

2.understandreduciblemodules,freemodules andbeabletofindtherankofalinearmapping

3.understandEinstein'scriteriaforirreduciblepolynomials andalgebraicextensions4.understandsplittingfields and finitefields

5.understandthe Fundamentaltheoremof Galoistheory

UNITI

Algebraicextension offields

IrreduciblepolynomialsandEisenstein'scriterion-Adjunctionofroots-Algebraicextensions-Algebraicallyclosed fields.(Sections 15.1 to 15.4ofthe Chapter15 inthepresc ribed text book.)

UNITII

Normalandseparableextensions

Splitting fields-Normal extensions-multiple roots-finite fields.(Sections 16.1 to 16.4 of the Chapter 16inthepresc ribed text book.)

UNITIII

Normalandseparable extensions:Separableextensions.

GaloisTheory:Automorphismgroupsandfixedfields-fundamentaltheoremofGaloisTheory.(Section 16.5 of the Chapter 16 and Sections 17.1 to 17.2 of the Chapter 17 in the prescribed textbook.)

UNITIV

GaloisTheory

Fundamentaltheoremofalgebra.GaloisTheoryandApplicationsofGaloisTheory toClassicalproblems: Roots of unity and cyclotomic polynomials-Cyclic extensions (Section 17.3 of the Chapter17and sections 18.1and18.2 ofthe Chapter18 inthe prescribedtext book.)

UNITV

ApplicationsofGaloisTheory

Applications of Galois Theory to Classical problems: Polynomials solvable by radicals-symmetricfunctions-Ruler and compass constructions.(Sections18.3and18.4oftheChapter18inthepresc ribed textbook.)

Activities

Seminar/Quiz/Assignments/ApplicationsofAlgebratoReallifeProblem/ProblemSolving

TextBook

BasicAbstractAlgebrabyP.B.Battacharya,S.K.jain,S.R.Nagpaul,CambridgeUniversityPress.

ReferenceBooks

1. TopicsinAlgebrabyI.N.Herstein,2nd Edition,JohnWiley&Sons
2. AlgebrabySergeLang,RevisedThirdEdition,Springer
3. AlgebrabyThomasW.Hungerford,Springer

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SEMESTER-VIII

COURSE21:ELEMENTSOFELASTICITYAND FLUIDDYNAMICS

Theory Credits:4 5hrs/week

LearningOutcomes

Aftersuccessful completionofthe course, studentswill beable to

1. understandtheequationofcontinuityandgeneral analysisoffluidmotion.
2. understandtheequationofmotionofafluid,Bernoulli'sequationandcirculationtheorem.3.understandthe two dimensional fluid flows and their properties.
4.understandthevariousdeformationsandequationofcompatibility.
5.understandtheproperties ofthestress, Mohr'sDiagramand certainexamples ofstress.

Unit-I

Kinematics of fluids, real and ideal fluids, velocity of fluid at a point, streamlines and path lines,velocitypotential,velocityvector,localandparticleratesofchange,equationofcontinuity,Acceleration of fluid, conditions at a rigid boundary, General analysis of fluid motion (Chapter 2 ofText book 1)

Unit-II

Equation of motion of a fluid, pressure at a point in a fluid at rest and in a moving fluid, conditions at aboundaryoftwoinviscidimmisciblefluids,Euler'sequationsofmotion,Bernoulli'sequation.Discussion of the case of steady motion under conservative body forces, Vortex motion, Kelvin'scirculation theorem. Some further aspects of vortex motion (Chapter 3(excluding sections 3.8 to 3.11)of Text book 1)

Unit-III

Sometwo-dimensionalflows:Meaningoftwo-dimensionalflow,useofcylindricalpolarcoordinates,thestreamfunction,thecomplexpotentialfortwo–dimensional,irrotational,incompressible flow, complex potential for standard two – dimensional flows, some worked examples,two-dimensionalimagesystems.TheMilne-Thomsoncircletheorem,thetheoremofBlasius(Chapter5(excludingsections 5.10 to 5.12)of Text book 1)

Unit-IV

Analysisof strain:Deformation, affinedeformation, infinitesimal affine deformation,geometricalinterpretation of the components of strain, strain quadric of Cauchy, principal directions, invariants,general infinitesimal deformation, Examples of strain, equations of compatibility, finite deformations.(Chapter1 ofText book2)

Unit-V

Analysis of stress, body and surface forces, stress tensor, equations of equilibrium, transformation ofcoordinates,stressquadricofCauchy,Mohr'sdiagram,examplesofstress (Chapter2ofTextbook2)

Activities

Seminar/Quiz/Assignments/ ApplicationsofElements Elasticityand fluiddynamicstoReallifeProblem /Problem Solving

Textbooks

1. TextBookofFluidDynamicsbyF.Chorlton,CBSpublishersanddistributors,NewDelhi.
2. MathematicalTheoryof ElasticitybyI.S.Sokolnikoff2 ndedition; TataMcGrawHill-New Delhi

ReferenceBooks

1. FoundationsofFluid MechanicsbyS.W.Yuan, PrenticeHall
2. Anintroductionto FluidDynamics byBachelorG.K.,Cambridge UniversityPress, 2007.

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SEMESTER-VIII

COURSE22:ADVANCEDANALYSIS

Theory Credits:4 5hrs/week

LearningOutcomes

Aftersuccessfulcompletion thiscourse, thestudent willbe ableto
1.solvetheproblemsonconvergenceofSequencesandSeriesoffunctions2.understandthe Stone–Weierstras theorem
3.knowExponentialandLogarithmicfunctionsandFourierSeries
4. Lineartransformationsand differentiation5.understandthecontractionprinciple,thera nktheorem

UNITI

SequencesandSeriesofFunctions

DiscussionofMainProblem–UniformConvergence- UniformConvergenceandContinuity– UniformConvergenceandIntegration–UniformConvergenceandDifferentiation(Sections7.1to 7.18)

UNITII

Equicontinuous families of functions and Power

SeriesEquicontinuousfamiliesoffunctions–theStone–Weierstrasstheorem– PowerSeries(Sections7.19to 7.33&8.1 to 8.5)

UNITIII

SomeSpecialFunctions

TheExponentialandLogarithmicfunctions–TheTrigonometricfunctions– Algebraiccompletenessofthecomplete field– Fourier Series(Sections 8.6 to 8.16)

UNITIV

Functionsof severalvariables

Lineartransformation – Differentiation.(Sections9.1to9.21)

UNITV

Functionsofseveralvariables(continued..)

ThecontractionPrinciple–TheInversefunctionTheorem–TheimplicitfunctionTheorem–TheRankTheorem– Determinants(Sections 9.22 to9.41)

Activities

Seminar/Quiz/Assignments/ApplicationsofAnalysistoReallifeProblem/ProblemSolving

TextBook

PrinciplesofmathematicalAnalysisbyWalterRudin,McGrawHill InternationalEdition

ReferenceBooks

1. MathematicalAnalysis by.Tom.M. Apostal, NarosaPublishingHouse

2. ElementsofRealAnalysis by ShanthiNarayan andDr.M.D.Raisinghania,S. Chand &CompanyPvt.Ltd., NewDelhi
3. An Introduction to Real Analysis by Robert G.Bartle and Donlad R. Sherbert, John Wileyandsons(ASIA)Pvt.Ltd.

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SEMESTER-VIII

COURSE22:ADVANCED LINEARALGEBRA

Theory Credits:4 5 hrs/week

LearningOutcomes

Uponsuccessfulcompletionofthiscoursestudentshould beableto

1. understandthe basicto theanalysisofasingle lineartransformation onafinite-dimensionalvectorspaceandtheanalysisofcharacteristicvaluesandtherationalandJordancanonicalforms.
2. understandconceptoffinite-dimensionalinnerproductspaces andbasicgeometry,relatingorthogonalization and unitaryoperatorsand normal operators.
3. knowtheJordanform, computationofinvariantfactors
4. knowtheinnerproductspacesand theirproperties
5. knowaboutunitaryoperatorsandNormal operators

UNIT-I

ElementaryCanonicalForms

Introduction – Characteristic Values – Annihilating Polynomials –invariant subspaces – SimultaneousTriangulation– Simultaneous Diagonalization, Simultaneous

(Chapter6, Section6.1 to 6.5 ofthe text book)

UNIT-II

ElementaryCanonicalForms(Continued)

Direct–sumDecompositions–invariantdirect sums–the primarydecompositiontheorem

(Chapter 6, Section 6.6 to 6.8 of the text book)The Rational and Jordan Forms: cyclic subspaces andAnnihilators – cyclic decompositions and the rational form.(Chapter 7, Section 7.1 to 7.2 of the textbook)

UNIT-III

ElementaryCanonicalForms(Continued)

TheJordanForm–ComputationofInvariantFactors–SemiSimpleOperators.(Chapter7,Section 7.3to 7.5 of thetext book)

UNIT-IV

Innerproductspaces

Innerproducts,Innerproductspaces,Linearfunctionalsandadjoints,(Chapter8,Section8.1to8.3ofthe text book)

UNIT-V

Innerproductspaces(continued)

Unitaryoperations, Normal operators(Chapter 8,Section8.4 to 8.5 of thetextbook)

Activities

Seminar/Quiz/Assignments/ApplicationsofLinearAlgebratoReallifeProblem/ProblemSolving

TextBook

LinearAlgebrabyKennethHoffmanandRayKunze,secondedition,PrenticeHallofIndiaPrivateLimited,New Delhi.

ReferenceBooks

1. FirstCourseinLinearAlgebrabyBhattacharya,P.B.,Jain,S.KandNagpal,S.R.,WileyEasternLtd.NewDelhi
2. LinearAlgebrabyHenryHelson, Hindustan BookAgency(1994)
3. TopicsinAlgebrabyI.N.Herstein, Secondedition(WileyEastern Ltd.)
4. AlgebrabyM.Artin, Prentice-Hallof IndiaprivateLtd.

SEMESTER-VIII

COURSE23:ADVANCEDTOPOLOGY

Theory Credits:4 5hrs/week

LearningOutcomes

Aftersuccessfulcompletionthiscourse,thestudentwillbeableto1.defi
neT_1-space, T_2–space
2.understandUrysohn's Lemma,and the Tietz's extension
theorem3.understandthe Stone–Chechcompactification,
4.understandandcandefinetheConnectednessof atopologicalspace
5.understandtheWeierstrassapproximationtheoremandStone-Weierstrasstheorems

UNIT-I

Separation

T1spacesandHausdorffspaces–Completelyregularspacesandnormalspaces–Urysohn'slemmaandthe Tietze's extensiontheorem. (Chapter 5: Sections26 to 28 Prescribedtext book).

UNIT-II

Separation(continued)

The Urysohn imbedding theorem – The Stone – Chech compactification. (Chapter 5: Sections 29 to 30Prescribed text book). Connectedness: Connected spaces– connectedness of Rn and Cn . (Chapter 6:Section31 Prescribed text book).

UNIT-III

Connectedness(continued)

The components of a space – Totally disconnected spaces – Locally connected spaces. (Chapter 6:Sections32 to 34 Prescribed text book)

UNIT-IV

Approximation

TheWeierstrassapproximationtheorem-TheStone-
Weierstrasstheorems(Chapter7:Section35to36Prescribed text book).

UNIT-V

Approximation(continued)

Locally compact Hausdorff spaces – The extended StoneWeierstrass theorems. (Chapter 7: Sections 37to38 Prescribed text book).

Activities

Seminar/Quiz/Assignments/Applicationsof TopologytoReallifeProblem/ProblemSolving

TextBook

IntroductiontoTopologyandModernAnalysisbyG.F.Simmons,InternationalStudentedition – McGraw– HillKogakusha,Ltd.

ReferenceBooks

1. Schaum'sOutlines:General TopologybySeymour Lipschutz
2. Topology: Afirst CoursebyJames Munkres,Prentice-HallPvt.Ltd.

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SEMESTER-VIII

COURSE23:DIFFERENTIALGEOMETRY

Theory Credits:4 5hrs/week

CourseOutcomes

Aftercompletion ofthecourse, thestudent will be able to

1. toknowaboutspace curves,planar curves
2. tocalculateTorsionand Curvature
3. toknowparametriccurvesonsurfacesRodrigue'sformula
4. toknowaboutminimalsurfaces
5. toknowcontravariantandcovariant

CourseContents

UnitI

Theoryof SpaceCurves

Spacecurves,Planercurves,Curvature,torsionandSerret-Frenetformulae.
Osculating circles, Osculating circles and spheres. Existence of space curves. Evolutes and involutes ofcurves.

Unit IITheoryofSurfaces

Parametriccurvesonsurfaces.Directioncoefficients.FirstandsecondFundamentalforms.PrincipalandGaussiancurvatures.Linesofcurvature,Euler'stheorem.Rodrigue'sformula,ConjugateandAsymptoticlines.

Unit IIIDevelopable

Developableassociated withspace curvesand curvesonsurfaces,Minimalsurfaces.

Unit IVGeodesics

Canonicalgeodesicequations.Natureofgeodesics onasurfaceofrevolution.Clairaut's theorem.Normalpropertyofgeodesics.Torsionofageodesic.Geodesiccurvature.Gauss-Bonnettheorem.Surfacesof constantcurvature.Conformalmapping.Geodesicmapping.Tissot'stheorem.

Unit VTensors

Summation convention and indicial notation, Coordinate transformation and Jacobian, Contra-variantand Covariant vectors, Tensors of different type, Algebra of tensors and contraction, Metric tensor and3-indexChristoffelsymbols,Parallelpropagationofvectors,Covariantandintrinsicderivatives,Curvature tensor and its properties, Curl, Divergence and Laplacian operators in tensor form, Physicalcomponents.

Activities

Seminar/Quiz/Assignments/ApplicationsofDifferentialGeometrytoReallifeProblem /ProblemSolving.

TextBook

An Introduction toDifferential GeometrybyT.J. Willmore, DoverPublications, 2012.

ReferenceBooks

1. ElementaryDifferential GeometrybyB.O. Neill,2nd Ed., AcademicPress,2006.
2. DifferentialGeometryof Three Dimensions byC.E. Weatherburn,Cambridge UniversityPress2003.

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SEMESTER-VIII

COURSE24:ORDINARYDIFFERENTIALEQUATIONS

Theory Credits:4 5 hrs/week

Learningoutcomes

Aftersuccessfulcompletion ofthe course,students willbeableto

1. comprehendthebridgebetweentherealfunctiontheoryandtheoryofordinarydifferentialequations
2. understandthebasictheorybehindexistence,uniqueness,continuityofsolutionsofordinarydifferentialequations
3. realizethedependence ofsolutionson variousparametersinvolvedinthe differentialequations
4. recognizethesignificancestudyingdifferentialsystemsanditsutilityinunderstandinghigherorderdifferentialequations
5. figureoutqualitativebehaviorofsolutionsofdifferentialequationsofvarious orders.

UnitI
RealFunctionTheory

EssentialconceptsfromRealFunctionTheory–Thebasicproblem-Thefundamentalexistenceanduniquenesstheorem–examplestodemonstratethetheory-continuationofsolutions(Sections10.1, oftheprescribed textbook)

UnitIIExistence andUniqueness

Dependenceofsolutionsoninitialconditions–dependenceofsolutionsonparameters(causalfunction f) - Existence and Uniqueness theorems for systems – existence and uniqueness theorems forHigherorder equations–examples(Sections 10.3, 10.4 of theprescribed text book)

UnitIII
Lineardifferentialsystems

Introduction to the theory of Linear differential systems – Theory and properties of Homogeneouslinearsystems (Sections11.1-11.3 ofthe prescribedtext book)

UnitIV
HomogeneousandNon-homogeneousSystems

Theory of non-homogeneous linear systems – Theory and properties of the nth order homogeneouslineardifferential equations (Sections 11.4 -11.6ofthe prescribed text book)

UnitV
Higherordernon-homogeneousLinearEquations

Theory of nth order Non homogeneous Linear equations – Sturm theory – Sturm Liouville Boundaryvalueproblems (Sections11.7, 11.8, 12.1 ofthe prescribed text book)

Activities

Seminar/Quiz/Assignments/ApplicationsofOrdinaryDifferentialEquationstoReallifeProblem/Problem Solving

TextBook

DifferentialEquationsbyShepleyL.Ross,WileyIndia

Referencebooks

1. Differential Equations with Applications and Historical Notes by George F. Simmons,(3rdedition).CRC Press. Taylor & Francis.
2. An Introduction to Ordinary Differential Equations by Earl A. Coddington, Prentice-Hall ofIndia

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SEMESTER-VIII

COURSE24:APPLICATIONSOFALGEBRA

Theory Credits:4 5 hrs/week

CourseOutcomes

Aftercompletionofthe course,the studentwillbeableto

1. understand Booleanpolynomialsand Boolean functions
2. understanddesigningand simplificationofcircuits
3. understandincidencematrix ofaBIBDandconstructionofBIBD fromfinitefields
4. know theconcept ofcodingtheory
5. generatingFunctionsfornon-isomorphicGraphs

Unit– I

BooleanalgebraandSwathingCircuits

Boolean Algebras; Switches and Logic Gates; Laws of Boolean algebra; Boolean Polynomials andBoolean Functions; Switching Circuits and Gate Networks; Simplification of Circuits; DesigningCircuits(1.1 to 1.7 ofChapter 1)

Unit– II

BalancedIncompleteBlockDesigns(BIBD)

Basic Definitions and Results; Incidence Matrix of a BIBD; Construction of BIBDs from DifferenceSets; construction of BIBD using quadratic residues; Difference set families, construction of BIBDfromfinite fields. (2.1 to2.6 ofChapter2)

Unit – IIICodingTheory

Introduction to Error - Correcting Codes, Linear Codes, Generator and Parity - Check Matrices,MinimumDistance, HammingCodes, Decoding,CyclicCodes.(4.1 to4.3of Chapter4)

Unit-IV

Symmetry GroupsandColorPatterns

PermutationGroups,GroupsofSymmetries;ColouringandColouringPatterns,PolyaTheoremandPattern Inventory, GeneratingFunctions fornon-isomorphicGraphs

(5.1to 5.3, 5.6 to 5.7 of Chapter5)

Unit – VWallpaperPatternGroups

Group of Symmetries of a Plane; Wallpaper Pattern Groups; Change of Basis in R2(6.1 to 6.3 ofChapter6)

Activities

Seminar/Quiz/Assignments//ProblemSolving.

TextBook

TopicsinAppliedAbstractAlgebrabyS.R.NagpaulandS.K.Jain,ThomsonBrooksandCole,Belmont, 2005

ReferenceBook

ApplicationsofAbstractAlgebrawithMaplebyRichardE.Klima,NeilSigmon,ErnestStitzinger,CRC PressLLC, BocaRaton, 2000.

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SEMESTER-VIII

COURSE25:OPERATIONSRESEARCH

Theory Credits:4 5 hrs/week

LearningOutcomes

Aftersuccessfulcompletion ofthe course,students willbeableto

1. studyonLPPenablesto arrive atanoptimaldecision/solutionsindifficultdecisionmaking.
2. studyonLPPappliedtoproblemspertainingtobothprofitmakingandlowcostrelatedrealworldsituatio n.
3. studyonPostoptimal analysisenablesintomanageandcontrolresourceallocation.
4. studyofTransportationproblemandAssignmentproblemintroducestoimplementingsimplexproced ureformorevariables usingModi methodsteppingstone method and hungarymethod
5. studyongamesandstrategieshelpsindecisionmakingforproblemswithcompetitivesituations likecandidates forelections, marketingcampaigns bydifferentcompaniesetc.

UNIT-I

LinearProgramming:SimplexMethod

Introduction-Fundamentalpropertiesofsolutions-Thecomputationalprocedure-Useofartificialvariables.12 hours(Sections 4.1to 4.4 oftheChapter4 in thePrescribedText Book)

UNIT-II

DualityinLinearPrograming

Introduction-GeneralPrimal-Dualpair-FormulatingaDualproblem-Prime-DualPairinmatrixform-Dualitytheorems-ComplementaryslacknesstheoremDualityandsimplexmethod.12hours(Sections 5.1to 5.7of theChapter 5in thePrescribed TextBook)

UNIT-III

DualityinLinearPrograming

EconomicInterpretationofDuality,DualSimplexmethodPost-optimalAnalysis:Introduction-Variation in the cost vector-Variation in the requirement vector-variation in the coefficient matrix-Structural variations- Applications of Post-optimal Analysis. 12 hours (Sections 5.8, 5.9 and 6.1 to 6.6oftheChapters 5 and 6 in the Text Prescribed Book)

UNIT-IV

TransportationProblemandAssignmentProblem

Introduction-Generaltransportationproblem-Thetransportationtable-Solutionofatransportationproblem-Finding an initial basic feasible solution-Test for optimality-Degeneracy in Transportationproblem-Transportation Algorithm (MODI Method)- Introduction -Mathematical formulation of theproblem-TheAssignmentmethod-SpecialcasesinAssignmentproblem-AtypicalAssignmentproblem. 12 hours (Sections 10.1 to 10.3 and 10.8 to 10.11 of the Chapter 10 in the Prescribed TextBook.)(Sections 11.1 to 11.5 oftheChapter11 inthe Prescribed Text Book)

UNIT-V

GamesandStrategies

Introduction-Two-personzero-sumgames-somebasicterms-Themaximin-minimaxprinciple-Gameswithoutsaddlepoints-Mixedstrategies-Graphicsolutionof2xnandmx2games.12hours(Sections to17.6 of theChapter17)

Activities

Seminar/Quiz/Assignments/ApplicationsofOperationsResearchtoReallifeProblem /ProblemSolving

TextBook

OperationsResearchbyKantiSwarup,P.K.GuptaandManMohanSultanChand&Sons,NewDelhi, 2006.

ReferenceBooks

1. OperationsResearch,AnIntroductionbyHamdy ATaha,MaxwellMacmillanInternationalEdition,New York, 1992.

2. OperationsResearchTheory,methodsandApplicationsbyS.D.Sarma,kedarnathRamnathpublications,2008.

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SEMESTER-VIII

COURSE25:MATHEMATICAL MODELLING

Theory Credits:4 5 hrs/week

LearningOutcomes

Aftersuccessfulcompletion of the course,students willbeableto

1. understandconceptof modellingandsimulation
2. constructmathematicalmodelsofrealworldproblems
3. solvethemathematicalmodelsusingmathematical techniques
4. knowtheneedformathematicalmodellingthroughdifference equations
5. toknowHarrodModelandcobwebapplicationmodeltoActuarialscience

Unit– 1MathematicalModelin g

Simplesituationsrequiringmathematicalmodeling,characteristicsofmathematicalmodel.(Chapter1Sections1.1-1.5 ofthe Text Book)

Unit– 2

Mathematical Modeling through ordinary differential equations of first order LinearGrowthandDecayModels.Non-Linear growthanddecaymodels,Compartment models.(Chapter2 Sections 2.1-2.4 ofthe Text Book)

Unit– 3

Mathematical Modeling through system of Ordinary differential equations of first order Prey-predator models, Competition models, Model with removal and model withimmigrations.Epidemics: simple epidemic model, Susceptible-infected-susceptible(SIS) model, SISmodelwithconstantnumberofcarriers.Medicine:ModelforDiabetesMellitus.(Chapter3Sections3.11,3.12, 3.2 ofthe Text Book)

Unit– 4

Mathematical Modeling through difference equationsIntroduction to difference equations Theneedformathematicalmodellingthrough differenceequations :somesimple models,basic theoryof linear difference equations with constant coefficients (Chapter 5 Sections 5.1 and 5.2 of the TextBook)

Unit-5

Mathematical Modeling through difference equationsIntroduction to differenceequations(continued…)

HarrodModel,cobwebmodelapplicationtoActuarialScience(Chapter5 Sections5.3(5.3.3notincluded))

Activities

Seminar/Quiz/Assignments/ApplicationsofMathematicalModellingtoReallifeProblem /ProblemSolving

Textbook

MathematicalModelingbyJN Kapur,NewAge Internationalpublishers.(2009)

ReferenceBooks

1. MathematicalModellingwith CaseStudiesbyBarnes,B.,Fulford, G.R.,CRCPress,2008.
2. An introduction to mathematical modeling by Bender, E. A. (2012), CourierCorporation.
3. MathematicalModellingbyMeerschaert, M.M., (2013)AcademicPress.

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Document : 3 (4)B.Sc MicrobiologySyllabus-2023

AndhraPradeshStateCouncilofHigherEducation

Programme:B.Sc.,Honoursin MICROBIOLOGY:MAJOR

w.e.f2023-24AY

COURSESTRUCTURE

Year	Semester	Course	Title	Hr/week	credits
I	I	1	IntroductiontoClassicalBiology	5	4
		2	Introductiontoappliedbiology	5	4
	II	3	IntroductiontoMicrobiology	3	3
			IntroductiontoMicrobiology	2	1
		4	BacteriologyandVirology	3	3
			BacteriologyandVirology	2	1
II	III	5	Eukaryoticmicroorganisms	3	3
			Eukaryoticmicroorganisms	2	1
		6	Biomolecules&Enzymology	3	3
			Biomolecules&Enzymology	2	1
		7	MicrobialandAnalyticalTechniques	3	3
			MicrobialandAnalyticalTechniques	2	1
		8	CellBiologyandGenetics	3	3
			CellBiologyandGenetics	2	1
	IV	9	MolecularBiologyandMicrobialGenetics	3	3
			MolecularBiologyandMicrobialGenetics	2	1
		10	MicrobialPhysiologyandMetabolism	3	3
			MicrobialPhysiologyandMetabolism	2	1
		11	rDNAtechnology,Biostatistics&Bioinformatics	3	3
			r DNA technology, Biostatistics&Bioinformatics	2	1
III	V	12A	Immunology&Medical Microbiology	3	3
			Immunology&Medical Microbiology	2	1
			OR		
		12 B	PharmaceuticalMicrobiology	3	3
			PharmaceuticalMicrobiology	2	1
		13A	AppliedMicrobiology	3	3
			AppliedMicrobiology	2	1
			OR		
		13 B	DiagnosticMicrobiology	3	3
			DiagnosticMicrobiology	2	1
		14A	IndustrialMicrobiology	3	3
			IndustrialMicrobiology	2	1
			OR		
		14 B	AgriculturalMicrobiology	3	3
			AgriculturalMicrobiology	2	1

		15A	FoodandDairyMicrobiology	3	3
			FoodandDairyMicrobiology	2	1
			OR		
		15 B	EnvironmentalBiotechnology	3	3
			EnvironmentalBiotechnology	2	1
	VI		Internship		
IV	VII	16	VII&VIIIsemestersyllabuswillbeavailablein due courseof time		
		17			
		18			
	SEC	19			
		20			
	VIII	21	VII&VIIIsemestersyllabuswillbeavailablein due courseof time		
		22			
		23			
	SEC	24			
		25			

Semester–1

Course:1 **INTRODUCTIONTOCLASSICALBIOLOGY**

Hours/Week:5 **Credits:4**

Learningobjectives

Thestudentwillbeabletolearnthediversityandclassificationoflivingorganisms and understand their chemical, cytological, evolutionary and geneticprinciples.

LearningOutcomes

1. Learntheprinciplesofclassificationandpreservationofbiodiversity
2. Understandtheplant anatomical,physiologicalandreproductiveprocesses.
3. Knowledge on animal classification, physiology, embryonic development and theireconomicimportance.
4. Outline the cell components, cell processes like cell division, heredity and molecularprocesses.
5. Comprehend the chemical principles in shaping and driving the macromolecules and lifeprocesses.

Unit1:Introductiontosystematics,taxonomyandecology.

Systematics– Definition and concept, Taxonomy– Definition andhierarchy.

Nomenclature– ICBN andICZN,Binomialandtrinomialnomenclature.

Ecology–Conceptofecosystem,Biodiversityandconservation.

Pollutionandclimatechange.

Unit2:EssentialsofBotany.

Theclassification ofplantkingdom.

Plant physiological processes (Photosynthesis, Respiration,Transpiration,phytohormones).

Structureofflower–

Microandmacrosporogenesis,pollination,fertilizationandstructureof mono and dicotembryos.

2.4Mushroom cultivation, floriculture and landscaping.

Unit3:EssentialsofZoology

3.1.Theclassification ofKingdomAnimaliaandChordata.

AnimalPhysiology–
BasicsofOrganSystems&theirfunctions,HormonesandDisorders

DevelopmentalBiology–Basicprocessofdevelopment(Gametogenesis,Fertilization,

Cleavageand Organogenesis)

EconomicZoology–Sericulture,Apiculture,Aquaculture

Unit4:Cellbiology,GeneticsandEvolution

Celltheory,Ultrastructureofprokaryoticandeukaryoticcell,cellcycle.

Chromosomesandheredity –Structureofchromosomes,conceptofgene.

CentralDogma ofMolecularBiology.

Originoflife

Unit5:Essentialsofchemistry

Definitionandscopeofchemistry,applicationsofchemistryindailylife.

Branchesofchemistry

Chemicalbonds–ionic,covalent,noncovalent–

VanderWaals,hydrophobic,hydrogenbonds.

Green chemistry

References

1. Sharma O.P.,1993.Planttaxonomy.2nd Edition.McGrawHillpublishers.
2. PandeyB.P.,2001.ThetextbookofbotanyAngiosperms.4th edition.S.Chandpublishers,New Delhi,India.
3. JordanE.L.,VermaP.S.,2018.ChordateZoology.S.Chandpublishers,New Delhi,India.
4. Rastogi, S.C., 2019. Essentials of animal physiology. 4th Edition. New Age InternationalPublishers.
5. Verma P.S., Agarwal V.K., 2006. Cell biology, genetics, Molecular Biology, EvolutionandEcology. S. Chand publishers, NewDelhi, India.
6. Sathyanarayana U.,Chakrapani, U.,2013. Biochemistry.4th Edition.Elsevierpublishers.
7. JainJ.L.,SunjayJain,NitinJain,2000.FundamentalsofBiochemistry.S.Chandpublishers,New Delhi,India.
8. Karen Timberlake, William Timberlake, 2019. Basic chemistry. 5th Edition. Pearsonpublishers.
9. SubrataSenGupta,2014. Organicchemistry.1st Edition.Oxfordpublishers.

ACTIVITIES:

1. Makeadisplay chart oflifecycle of nonfloweringplants.
2. Makeadisplay chart oflifecycle offloweringplants.
3. Studyofstomata
4. Activityto provethat chlorophyll isessential forphotosynthesis

5. Studyofpollengrains.
6. Observationofpollengermination.
7. Ikebana.
8. Differentiatebetweenedibleandpoisonousmushrooms.
9. Visitanearbymushroomcultivationunitandknowtheeconomicsofmushroomcultiv ation.
10. Drawthe Ultrastructure ofProkaryoticandEukaryoticCell
11. VisittoZoologyLabandobservedifferenttypesofpreservationofspecimens
12. Hands-on experience of various equipment – Microscopes, Centrifuge, pH Meter,Electronic WeighingBalance,LaminarAirFlow
13. VisittoZoo/Sericulture / Apiculture/ Aquacultureunit
14. Listoutdifferenthormonal,geneticandphysiologicaldisordersfromthesociety

Semester–1

Course:2 **INTRODUCTIONTOAPPLIEDBIOLOGY**

Hours/Week:5 **Credits:4**

Learningobjectives

The student will be able to learn the foundations and principles of microbiology,immunology, biochemistry, biotechnology, analytical tools, quantitative methods,andbioinformatics.

LearningOutcomes

1. Learnthehistory,ultrastructure,diversityandimportanceofmicroorganisms.
2. Understandthestructureandfunctionsofmacromolecules.
3. Knowledgeonbiotechnology principlesandits applicationsinfood andmedicine.
4. Outlinethetechniques,toolsandtheirusesindiagnosisandtherapy.
5. Demonstrate the bioinformatics and statistical tools in comprehending the complexbiologicaldata.

Unit1:EssentialsofMicrobiologyandImmunology

History and Major Milestones of Microbiology; Contributions of Edward Jenner,LouisPasteur, Robert Koch and Joseph Lister.

GroupsofMicroorganisms– StructureandcharacteristicsofBacteria,Fungi,ArchaeaandVirus.

Applications of microorganisms in– Food,Agriculture, Environment, andIndustry.

Immunesystem–Immunity,typesofimmunity,cellsandorgansofimmunesystem.

Unit2:EssentialsofBiochemistry

BiomoleculesI–Carbohydrates,Lipids.

Biomolecules II–Amino acids&Proteins.

BiomoleculesIII–Nucleicacids -DNAandRNA.

Basics ofMetabolism– Anabolismandcatabolism.

Unit3:EssentialsofBiotechnology

History,scope,andsignificanceofbiotechnology.ApplicationsofbiotechnologyinPlant, Animal, Industrialand Pharmaceuticalsciences.

Environmental Biotechnology – Bioremediation and Biofuels, Biofertilizers andBiopesticides.

Genetic engineering – Gene manipulation using restriction enzymes and cloningvectors;Physical, chemical, and biologicalmethods of genetransfer.

Transgenic plants – Stress tolerant plants (biotic stress – BT cotton, abiotic stress – salttolerance). Transgenic animals– Animal and diseasemodels.

Unit4:AnalyticalToolsandtechniquesinbiology–Applications

Applicationsinforensics–PCRandDNAfingerprinting

Immunologicaltechniques– ImmunoblottingandELISA.

Monoclonalantibodies–Applications indiagnosisandtherapy.

EugenicsandGenetherapy

Unit5:BiostatisticsandBioinformatics

Datacollectionandsampling.Measuresofcentraltendency –Mean,Median,Mode. Measures of dispersion – range, standard deviation and variance. Probability and testsofsignificance.

Introduction,Genomics,Proteomics,typesofBiologicaldata,biologicaldatabases-NCBI,EBI, GenBank; Protein 3Dstructures, Sequencealignment

AccessingNucleicAcidandProteindatabases,NCBIGenomeWorkbench

REFERENCES

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3. Sathyanarayana U.,Chakrapani, U.,2013. Biochemistry.4th Edition.Elsevierpublishers.

4. JainJ.L.,SunjayJain,NitinJain,2000.FundamentalsofBiochemistry.S.Chandpublishers,New Delhi,India.

5. R.C.Dubey,2014.AdvancedBiotechnology.S. Chand Publishers, NewDelhi,India.

6. Colin Ratledge, Bjorn, Kristiansen, 2008. Basic Biotechnology. 3rd Edition. CambridgePublishers.

7. U. Sathyanarayana, 2005. Biotechnology. 1st Edition. Books and Allied Publishers pvt.ltd., Kolkata.

8. Upadhyay,UpadhyayandNath.2016.BiophysicalChemistry,PrinciplesandTechniques.HimalayaPublishing House.

9. ArthurM.Lesk.IntroductiontoBioinformatics.5th Edition.Oxfordpublishers.

10. APKulkarni, 2020. Basics ofBiostatistics. 2nd Edition. CBSpublishers.

ACTIVITIES

1. Identificationofgivenorganismasharmfulorbeneficial.
2. Observationofmicroorganismsfromhousedustundermicroscope.
3. Findingmicroorganismfrompondwater.
4. Visittoamicrobiologyindustryorbiotechcompany.
5. Visittoawastewatertreatmentplant.
6. Retrieving aDNA orproteinsequence ofagene'
7. Performing aBLAST analysis forDNA andprotein.
8. Problemsonbiostatistics.
9. Field trip and awareness programs on environmental pollution by different types ofwastesand hazardousmaterials.
10. Demonstrationonbasic biotechnologylabequipment.
11. Preparationof3Dmodelsofgeneticengineeringtechniques.
12. Preparationof3Dmodelsoftransgenic plantsandanimals.

[**NOTE**:Inthecollegeswherethereisavailabilityoffacultyformicrobiologyandbiotechnology,thosechaptersneedtobehandledbymicrobiologyandbiotechnology faculty. In other colleges, the above topics shall be dealt by BotanyandZoology faculty]

IISEMESTER

COURSE3:-INTRODUCTION TOMICROBIOLOGY

credits-_3

I. CourseOutcomes:

Onsuccessfulcompletionofthecourse,the studentswillbeableto

1. Understand the historical significance of microbiology and the contributions ofkeyscientists.
2. Recognizethe classificationofmicroorganismsandtheirplaceinthelivingworld.
3. Comprehend the scope and applications of microbiology, including the origin ofmicrobiallifeandthe distinction betweeneukaryoticand prokaryoticcells.
4. Describethecharacteristicsofbacteria,archaea,fungi,algae,andprotozoa.
5. Describeviruses,includingtheirnature,composition,anddiversityinstructure.
6. Develop practical skills in aseptic techniques, growth media preparation, isolationmethods,and the identification ofbacteriaandfungi.

Unit-1: **HistoryofMicrobiology** **No. ofHours: 10**

1. DiscoveryofMicroscopeandmicrobialworldbyAntonvonLeeuwenhoek;Aseptic techniques with reference to Charak Samhita, Sushruta Samhita and IgnazPhilippSemmelweis
2. Golden era of Microbiology- Refutation of abiogenesis; Germ theory of Disease;Discoveryof vaccination; Discovery ofpenicillin
3. MajorcontributionsofScientists:EdwardJenner,LouisPasteur,RobertKoch,Jose phLister, Ivanowsky,MartinusBeijerinckandSergeiWinogradsky

Unit-2: Placeof Microorganismsin thelivingworld **No. ofHours:10**

1. Haeckel's three Kingdom concept, Whittaker's five kingdom concept, threedomainconcept of CarlWoese
2. DefinitionandscopeofMicrobiology;ApplicationsofMicrobiology;Diversegroupsof Microorganisms
3. Origin of microbial life on earth- Timeline, Miller's Experiment, endosymbiosis(cyanobacteria),distinguishing featuresof eukaryoticand prokaryoticcell

Unit-3:ProkaryoticmicroorganismsandViruses **No. ofHours:10**

1. General characteristics of Bacteria (Morphology, metabolic diversityandreproduction)
2. GeneralcharacteristicsofArchaeadifferentiatingthemfromBacteria

3. Generalcharacteristicsofviruses(Nature,composition,size,hostspecificity,diversityin structure)

Unit-4:Eukaryoticmicroorganisms **No. ofHours:10**

1. Fungi-Habitat,nutrition,vegetativestructureandmodesofreproduction;

2. Algae- Habitat, thallus organization, photosynthetic pigments, storage forms offood,reproduction.

3. Protozoa–Habitat, cell structure, nutrition, locomotion, excretion, reproduction,encystment.

Unit - 5: Growing Microbes inLab:FiveI's **No. ofHours:05**

1. Inoculation-Aseptic methods of introducing inoculum to growth media;Compositionof basic growth media, solid andliquid
2. Incubation and Isolation- Ambient temperature for growth of microorganisms;Conceptof Pureculture,mixedcultureand contaminatedculture
3. InspectionandIdentification-Observationofcolour,sizeandshapeofcolonies;Wetmount and simple staining of bacteriaandfungi

III. SkillOutcomes:

1. Implementsafetyprotocols,handlinghazardousmaterials,andpracticingpersonalprotectivemeasures.

2. Identifymicroscopeparts,adjustingfocusanddiaphragm,andaccuratelyobservingand documenting microscopicimages.

3. Prepare smears, identifying different microorganisms, and interpretingmicroscopiccharacteristics.

4. Analyze electron micrographs, identifying virus types, and describing theirmorphologyandsize.

5. Operate Autoclave, Hot Air Oven, and Laminar Air Flow Chamber forsterilizationand decontaminationpurposes.

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COURSE3:-INTRODUCTION TOMICROBIOLOGY

credits-_1

1. GoodLaboratoryPracticesandBiosafety
2. CompoundLightmicroscope-Partsanditshandling
3. Microscopicobservationofbacteria,AlgaeandFungiandprotozoa
4. Observation of electron micrographs of viruses (Lambda, T4, TMV, HIV, SARSCoV-2,Polio)
5. Laboratory equipment -Working principles of Autoclave, Hot air oven, Laminarairflowchamber

IV. References:

1. Pelczar, M.J., Chan, E.C.S. and Kreig, N.R. (1993). Microbiology. 5thEdition,Tata McGraw HillPublishing Co., Ltd.,NewDelhi.
2. ·Dube, R.C. and Maheswari, D.K. (2000) General Microbiology. S Chand,NewDelhi. Edition), HimalayaPublishingHouse,Mumbai.
3. Prescott, M.J., Harley, J.P. and Klein, D.A. (2012). Microbiology. 5thEdition,WCB McGrawHill, NewYork.
4. Reddy, S.M. and Reddy, S.R. (1998). Microbiology Practical Manual, 3 rdEdition,Sri PadmavathiPublications,Hyderabad.
5. Singh,R.P.(2007).GeneralMicrobiology.KalyaniPublishers,NewDelhi.
6. Stanier,R.Y.,Adelberg,E.A.andIngram,J.L.(1991).GeneralMicrobiology,5thE d.,Prentice Hall ofIndiaPvt. Ltd.,NewDelhi.
7. Jaya Babu (2006). Practical Manual on Microbial Metabolisms andGeneralMicrobiology. Kalyani Publishers, NewDelhi.
8. GopalReddyetal.,LaboratoryExperimentsinMicrobiology

V. Co-CurricularActivities:

1. EstablishaMicrobiologyClubwherestudentscancometogethertodiscussandexplorevarious topics related tomicrobiology.

2. Organizing microbiology-themed events like

microbiologyday 3 Poster presentations, oral presentations,

and Q&Asessions.

4. FieldTripstoMicrobiology-relatedSites

5. EstablishaMicrobiologyJournalClubwherestudentscanreviewanddiscussscientificarticlesrelatedtomicrobiology.

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COURSE 4:-BACTERIOLOGY ANDVIROLOGY

credits-_3

I. Learning Outcomes:

Onsuccessfulcompletionofthecourse,the studentswillbeableto

1. Understandthe concept ofprokaryoticdiversity andtaxonomy.
2. Identifyanddescribethe salientfeaturesofvariousbacterialgroups
3. Comprehendthediscovery,nature,anddefinitionofviruses.
4. Describethereplicationprocessesofspecificviruses
5. Comprehendtheconceptofoncogenic viruses,androleofviruses intheecosystem.

Unit-1:BacterialTaxonomyandUltrastructure No. ofHours: 9

1. Introduction to prokaryotic diversity and taxonomy. Types of classification-Numericaland Phylogenetic
2. IntroductiontoBergy's manualofSystematicBacteriology
3. Non-CulturablesandMetagenomics
4. UltrastructureofaBacterialCell-Invariablecomponents-cellwall,Structureand/Functions of cell membrane, cytoplasm, nucleoid; Variable components- plasmid,inclusionbodies,flagella(structureand arrangement),pili, capsule, endospore.

Unit-2: Typestudies ofBacteriaandArchae No. ofHours:9

1. Salientfeaturesof:

a) Photosyntheticbacteria- Purplebacteria,Greenbacteriaand*Anabaena*

b) Glidingbacteria-Myxobacteria andCytophagagroup

c) Filamentous-Actinomycetes

d) Sporeformingbacteria-BacillusandClostridia

e) Miscellaneous-Mycoplasma,Rickettsia, Chlamydia

2. SalientfeaturesofFermentativebacteria,Sulphurbacteria,Nitrogenfixingbacteria
3. SalientfeaturesofExtremophiles-Methanogensandhalobacteria.

Unit-3:GeneralPropertiesandClassificationof Viruses No. ofHours:9

1. Discoveryofviruses, Natureanddefinition ofviruses, generalproperties
2. HeirarchyofICTVnomenclature

3. Outlineof Baltimoresystem ofclassification.

4. CultivationofViruses,VirusPurificationand Assay.

Unit-4:Replicationof Viruses **No. ofHours:9**

1. GeneralfeaturesofViralReplication
2. ReplicationofT4, lambda,TMV ,HIV
3. ReplicationofPolio,Influenza,AdenoViruses

Unit-5:PathogenicandotherViruses **No. ofHours:**9

1. DefectiveViruses-viroids, virusoids,satelliteviruses andPrions.
2. Emergence of Viral Pathogens, Introduction to Oncogenic viruses, Concept ofOncogenesand Protooncogenes
3. Roleofviruses inEcosystems;Applications inBiotechnology

III. SkillOutcomes:

Onsuccessfulcompletionofthecourse,the studentswillbeableto

1. Developpracticalskillsintheisolation,identification,andcultivationofbacteria.
2. Acquire knowledge about the preparation of growth media and study host-pathogeninteractions.
3. Gaintheabilitytoexaminethebacteriathrough microscopy.
4. Demonstrateproficiencyinisolating bacteriafromnaturalenvironment

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COURSE 4:-BACTERIOLOGY ANDVIROLOGY

credits-1

1. Studyofbacteriaby colonyobservationandstaining-simple,gram
2. Observationofmotilityandcapsule
3. IsolationofbacteriausingWinogradskycolumnandobservation
4. Studyofviruses(Bacteriophage,TMVandHIV)usingmicrographs
5. Isolationandenumerationofbacteriophages(PFU)fromwater /sewagesampleusingdoubleagarlayertechnique.
6. Studyingisolationandpropagationofanimalvirusesbychickembryotechniqu e.
7. Studyofcytopathiceffectsofvirusesusingphotographs.
8. Performlocallesiontechniqueforassayingplantviruses.

References:

1. Prescott, M.J.,Harley,J.P.andKlein,D.A.Microbiology. 5th Edition WCB McGrawHill,New York,(2002).
2. Tortora, G.J., Funke ,B.R. and Case, C.L. Microbiology : An Introduction. PearsonEducation,Singapore, (2004).
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4. BlackJ.G.Microbiology- PrinciplesandExplorations.JohnWiley&SonsInc.New York,(2002).
5. TomBesty,D.CJimKoegh.MicrobiologyDemystifiedMcGRAW-HILL.
6. ChristopherBurrellColinHowardFrederickMurphy.FennerandWhite'sMed icalVirology5th Edition.Academic Press

Co-CurricularActivities:

1. Invite guest speakers, to provide insights into the latest advancements andemergingtrends in bacteriology and virology.

2. Conduct laboratory workshops that allow students to gain hands-on experience inbacterialculturetechniques

3. Case Study Competitions: Organize case study competitions where students canwork in teams to analyze and solve hypothetical cases related to bacteriology andvirology

4. Arrange field trips to microbiology research facilities, such as government labs,industrialsettings, or healthcareinstitutions

IIISEMESTER

COURSE5:-EUKARYOTICMICROORGANISMS

credits-_3

I. CourseOutcomes:

Onsuccessfulcompletionofthecourse,the studentswillbeableto

1. Understand the characteristics, classification, andreproductivemechanismsoffungi,algae,a ndprotozoa.
2. Recognize the importance of fungi in biotechnology, including theirrolesin food production,medicine,andagriculture.
3. Comprehend the significance of algae in various industries,theenvironment, and asasourceoffood.
4. Identify pathogenic protozoa and understand their impact on humanhealthand theenvironment.

Unit1: Fungi **No. ofHours:9**

1. Habitat, distribution, nutritional requirements, fungal cell ultra-structure,fungal wall, Outlineclassification ofFungi

2. Reproduction in different fungal groups-Phycomycetes,Ascomycetes,Basidiomycetes andDeuteromycetes

3. Heterokaryosis,heterothallismandparasexualmechanism.

4. Fungaldimorphism(Candidaalbicans)

Unit2:ImportanceofFungi **No. ofHours:9**

1. Role of fungi in biotechnology: food, medicine and pharmaceuticalindustry (baking, brewing, antibiotics, alcohols, enzymes, organic acids,andpharmaceuticals)

2. Beneficial Role of fungi in Agriculture: Biofertilizers, Myco toxins; Biologicalcontrol(Myco fungicides,Myco herbicides,Mycoinsecticides).

3. Mushroomsand itscultivation. (Whitebutton,Milky andOyster)

4. Fungi as plant and animal pathogens (Cercospora, Puccinia, Candida,Aspergillus)

Unit3:Algae **No. ofHours:9**

1. Algae- occurrence, thallus organization, algae cell ultra-structure, pigments,flagella,eyespot foodreserves, outlineclassification

2. Vegetative,asexualandsexualreproductionin Algae

3. Photosyntheticapparatus,and outlineofPhotosynthesis in Algae

Unit4:Importanceand cultivationofAlgae **No. ofHours:9**

1. Importanceofalgaeinagriculture,industry,environmentandfoodwithexa mples.

2. Algal culture techniques- Indoor, Outdoor, Closed, Open, Batch, continuous,Fedbatch

3. Culturemediaand growthparametersforalgalcultivation(Spirulina)

Unit5:Protozoa **No. ofHours:9**

1. GeneralcharacteristicswithspecialreferencetoAmoeba,Paramecium
2. PathogenicProtozoa-Plasmodium,LeishmaniaandGiardia
3. Importance of protozoa (in waste management, soil fertility, industryandscientificstudy)
4. Culturingprotozoansfromnaturalsources-Haywater,pondwater,Chalkley'ssolution
5. Haplobiontic(Nemalion),Haplontic(Chlamydomonas),Diplontic(Cladop hora),Diplobiontic(Polysiphonia)andDiplohaplontic(Cladophora)life cycles. deleted

II. SkillOutcomes:

Onsuccessfulcompletionofthecourse,the studentswillbeableto

1. Developpracticalskillsintheisolation,identification,andcultivationoffungiandalgae.
2. Acquire knowledge about the preparation of growth media and study host-pathogeninteractions.
3. Gain the ability to examine the vegetative and reproductive structures ofselectedgenerathroughmicroscopy.
4. Demonstrate proficiency in purifying and preserving pure cultures of commonalgaeandfungi.

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COURSE5:-EUKARYOTICMICROORGANISMS

credits-_1

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a.Preparation of PotatoDextroseMedium.

b.Isolation and identification of pathogenic and non-pathogenic fungi.c.Study of host-pathogeninteraction.

d. Studyofthevegetativeandreproductivestructuresoffollowinggenera through temporary and permanent slides: *Mucor, Saccharomyces,Penicillium, Agaricus* and*Alternaria*

e.Purification andpreservation of pureculturesofcommonalgaeandfungi.

References

1. Alexopoulus, C.J., Mims,C.W. and Blackwel, M, Introductory Mycology.JohnWiley,NewYork.
2. Mehrotra, R.S. and K.R.Aneja An Introduction to Mycology. New AgeInternationalpress, NewDelhi
3. Webster,J.Introductiontofungi.CambridgeUniversityPress.Cambridge,U.K.(1985).
4. Bessey E.A. Morphology and Taxonomy of fungi. Vikas Publishing House Pvt.Ltd.,NewDelhi.
5. Jhon Webster and R W S Weber. Introduction to Fungi. CambridgeUniversityPress2007.
6. A. V. S. S. .Sambamurty. A Textbook of Algae. I.K. International PublishingHousePvt.Limited,2010
7. H.D. Kumar and H.N. Singh.A Textbook on Algae (Macmillan internationalcollegeedition)

III. Co-CurricularActivities

1. Conduct hands-on microscopy workshops using to observeeukaryoticmicroorganisms

2. Organizefieldtripstonaturalhabitats,suchasforests,ponds,ormarineenvironments,whereeukaryoticmicroorganisms thrive.

3Arrange culturing workshops where students can learn how to isolate andcultureeukaryoticmicroorganisms in thelaboratory.

4. EukaryoticMicroorganism PhotographyContest

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COURSE6:-BIOMOLECULESANDENZYMOLOGY

credits-_3

I. CourseOutcomes:

Onsuccessfulcompletionofthecourse,the studentswillbeableto

1. Understandtheclassificationandpropertiesofcarbohydrates,includingmonosaccharides,disaccharides,polysaccharides,andsugarderivatives.
2. Gainknowledgeoflipidsandfattyacids,includingtheirclassification,structures,functions, and theirrolein cell signalingandmetabolism.
3. Comprehendthestructureandfunctionsofaminoacidsandproteins,includingtheir primary,secondary, tertiary, and quaternarystructures.
4. Learn about the structure and functions of nucleic acids, including DNA andRNA, as well as the concept of base composition and nucleic acid-proteininteractions.Theywillalsobeintroducedtotheroleofvitaminsinmetabolism.
5. Understand the structure of enzymes, enzyme classification, and mechanismsof action. They will also learn about the factors influencing enzyme activityandvarious types ofenzymeinhibition.

UNIT-I:Carbohydrates **No.ofhours: 9**

1. GeneralcharactersandoutlineclassificationofCarbohydrates
2. Monosaccharides- Glucose, fructose, ribose; Stereo isomerism ofmonosaccharides,epimers,mutarotationand anomersofglucose
3. Disaccharides- concept of reducing and non-reducing sugars;Sucrose,Lactose
4. Polysaccharides- Storage -Starch, glycogen, Structural-Cellulosepeptidoglycan andchitin
5. Sugarderivatives-glucosamine.

UNIT-II:Lipidsandfattyacids **No. ofhours: 9**

1.Definitionand classification of lipids. Structure and propertiesoflipids. Importanceof lipids in biologicalsystems.

2. Introductiontofattyacids:definition,structure,andnomenclature.Saturatedand unsaturatedfattyacids.
3. Triglycerides: structure, function, and metabolism.
   Phospholipids:structure, function, and role in cell membranes.
   Steroids: structure,biosynthesis, and physiological roles.Waxes: structure, functions, andapplications.

UNIT-III:AminoacidsandProteins. **No.ofhours:9**

1. Biochemicalstructureandnotationofstandardproteinaminoacids
2. Generalcharacteristicsof aminoacidsandproteins.

3. Primary,secondary,tertiaryandquaternarystructuresofProtein
4. Non protein amino acids: Gramicidin, beta-alanine, D-alanine andD-glutamicacid.

UNIT-IV:**NucleicacidsandVitamins** **No. ofhours:9**

1. StructureandfunctionsofDNAand RNA.
2. Base composition. A+T and G+C rich genomes. Basic concept ofnucleicacids proteininteractions.
3. Conceptand types of vitamins andtheirrolein metabolism.

UNIT-V:Enzymes **No. ofhours:9**

1. Structure of enzyme, Apoenzyme and cofactors, prosthetic group-TPP,coenzyme-NAD,metalcofactors;Definitionsofterms– enzymeunit,specificactivity andturnovernumber
2. Classification of enzymes, Mechanism of action of enzymes: activesite,transitionstatecomplexandactivationenergy.Lockandkeyhypothesis,andInducedFithypothesis.
3. EffectofpHand temperatureonenzyme activity.
4. Inhibitionofenzymeactivity-competitive,noncompetitive,uncompetitiveandallosteric.

III. SkillOutcomes:

Onsuccessfulcompletionofthecourse,the studentswillbeableto

1. QualitativelyIdentifymonoanddisaccharides
2. QualitativelyIdentifyspecificaminoacids
3. QuantitativelyestimateDNA
4. Quantitativelyestimateprotein

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COURSE6:-BIOMOLECULESANDENZYMOLOGY

credits-1

1. Qualitativetests forsugars
2. QualitativeAnalysisofAminoacids.
3. Colorimetricestimation DNAbydiphenylaminemethod.
4. ColorimetricestimationofproteinsbyBiuret/Lowrymethod

IV. References:

1. Berg JM, Tymoczko JL and Stryer L (2011) Biochemistry,W.H.Freeman and Company Caldwell, D.R. (1995). Microbial PhysiologyandMetabolism, W.C. BrownPublications,Iowa,USA.
2. Lehninger, A.L., Nelson, D.L. and Cox, M.M. (1993). Principles ofBiochemistry,2ndEdition,CBSPublishersandDistributors,NewDelhi.
3. Sashidhara Rao, B. and Deshpande, V. (2007). ExperimentalBiochemistry:Astudent Companion.I.K.InternationalPvt.Ltd.
4. Tymoczko JL, Berg JM and Stryer L (2012) Biochemistry: A shortcourse,2nd ed., W.H.Freeman
5. Voet,D. and Voet J.G (2004) Biochemistry 3rd edition, John Wileyand Sons
6. White, D. (1995). The Physiology and Biochemistry of Prokaryotes,OxfordUniversity Press, New York.

V. Co-CurricularActivities:

1. Organize Biomolecule Modeling Workshops where students can learn tobuildphysicalmodelsorusecomputersimulationstovisualizebiomoleculessu chasproteins,nucleicacids,carbohydrates,andlipids.Theseworkshopscanhelps tudentsunderstandthethree-dimensionalstructures and interactions of biomolecules, enhancing their comprehensionofmolecularbiologyconcepts.
2. Assign Biomolecule and Enzyme Case Studies case studies that requirestudentstoanalyzereal-worldscenariosrelatedtobiomoleculesandenzymesin medicine, biotechnology,or environmentalscience.

IIISEMESTER

COURSE7:MICROBIALANDANALYTICAL TECHNIQUES

credits-_3

I. CourseOutcomes:

Oncompletion ofthe course,the studentswill beable to

1. Understand the principles and applications of microscopy techniques, includingbright field microscopy and electron microscopy (SEM and TEM), as well asstainingtechniques.
2. Knowvarioussterilizationanddisinfectiontechniques,includingphysicalmethods(dryheat,moistheat,filtration,radiation)andchemicalmethods(disinfectants,alcohols, aldehydes,fumigants,phenols,halogens,heavymetals).
3. Performpureculture isolation,maintenanceandpreservationofcultures,cultivation of anaerobic bacteria, and accessing viable non-culturable bacteria(VNBC).
4. Understandtheprinciplesandapplicationsofspectrophotometryandchromatographytechniques,includingUV-visiblespectrophotometry,colorimetry,turbidometry,paperchromatography,andcolumnchromatography.
5. Gain knowledge of centrifugation principles and applications, electrophoretictechniques(agaroseandSDSpolyacrylamidegel),andtheprinciplesandapplicationsof radioisotopes.

Unit-1:Microscopy **No. ofHours:9hrs**

1	Microscopy: Principle, mechanism and applications of Bright fieldmicroscope.
2	Principle, mechanism and applications of electron microscope (SEMandTEM). Micrometry.
3	Staining Techniques – Simple, negative and Differential stainingtechniques(Gramstaining, sporestaining, Acidfaststaining).

Unit-2:Sterilizationanddisinfectiontechniques No.ofHours:9hrs1.Sterilization,Disinfection,Antiseptic,Germicide,Sanitizer,Fungicide,Virucide,Bacteriostatic and Bactericidal agent.

Physicalmethodsofmicrobialcontrol:Dryheat-Incineration,Hotair oven; Moistheat-Pressure cooker, autoclave; Filter sterilization- laminar air flow, Membrane filter;Radiationmethods– UVrays, Gammarays.

2Chemicalmethodsofmicrobialcontrol:disinfectants,typesandmodeofaction-alcohols,aldehydes, fumigants, phenols, halogens and heavy metals.

Unit-3:Microbiologicaltechniques

No.ofHours:9hrs 1 Pure culture isolation: Streaking, serial dilution and plating methods,micromanipulator;cultivation.

2 Maintenanceandpreservation/stockingofpurecultures:subculturing, overlaying cultures with mineral oils, lyophilization, sand cultures,storageatlowtemperature, Culturecollectioncenters(MTCC,ATCC,DSMZ);

3 Cultivation of anaerobic bacteria; Accessing Viable non-culturablebacteria(VNBC).Buffersinculturemedium.Cultivationoffungi,Actinomycetes,yeasts.

Unit-4:Spectrophotometry&Chromatography **No. ofHours: 9**

1 Spectroscopy–
Principles,lawsoflightabsorption,InstrumentationandapplicationsofUV-visiblespectrophotometer.Colorimetry andturbidometry.
2 Chromatography:Principlesandapplicationsofpaperchromatography(Ascending, Descendingand 2-D),Thin layerchromatography.

3 Principle and applications of column chromatography (Partition, adsorption, ionexchange, exclusion and affinity chromatography). Column packing and fractioncollection.

Unit-5:Centrifugation,Electrophoresis&Radioisotopes No.of Hours:9

1 Centrifugation-Principles,typesandapplications.

2 Electrophoretic technique (agarose and SDS polyacrylamide gel) itsComponents,working principleandapplications

3 Radioisotopes–
charactersandapplicationsofradioisotopes,principleofautoradiography.

II. SkillOutcomes:

Onsuccessfulcompletionofthecourse,the studentswillbeableto

1. Recognize different microscopy techniques, identify microbial cell structures,interpretmicrographimages,andunderstandingtheprinciplesofimagecontrast.
2. Prepare stained slides, differentiate stained and unstained structures, recognizingstainingtechniques,anddescribingthestainingcharacteristicsofmicrobialcells.
3. Perform the staining procedure, distinguishing between Gram-positive and Gram-negative bacteria, recognizing the importance of Gram's staining in bacterialclassification,and interpreting Gram-stained slides.
4. Understand sterilization principles, operate autoclave and hot air oven, implementproper sterilization protocols, ensure sterility of media and glassware, and recognizetheimportanceof steriletechniques in microbiology.
5. Understand streaking techniques, perform streak plate method, obtain isolatedcolonies, recognize contamination, and demonstrate proficiency in maintaining pureculturesforfurther study.

IIISEMESTER

COURSE7:MICROBIALANDANALYTICAL TECHNIQUES

credits-_1

1. Studyofbrightfield,darkfieldandphasecontrast,Electronmicroscopemicrographsto visualizemicrobial cells.
2. Simplestaining&Negativestaining.
3. Gram'sstaining.
4. SterilizationofmediumusingAutoclave,SterilizationofglasswareusingHotAirOven.
5. Isolationofpureculturesof bacteriabystreakingmethod.
6. Isolationofbacteriafromnaturalhabitatbyspreadandpourplatemethod(usingserialdilutio n method)
7. Separation of monosaccharides/amino acids by paper/thinlayerchromatography.
8. Demonstrationofcolumnpackingingelfiltrationchromatography.
9. Determinationofabsorptionmaxforanaromatic aminoacid.
10. Separation of bacterialcells(cellpellet)frombrothculture by usinga laboratoryscalecentrifuge.
11. SeparationofDNAfragmentsbyAgarosegelelectrophoresis.

VReferences:

1. Pelczar M., Chan E.C.S. and Krieg, N.R. Microbiology. Tata Mc Grew HillPublishingCo. Ltd., NewDelhi.
2. Stainier R.V., Ingraham, J.L., Wheelis, M.L. and Painter P.R. The Microbial World.Printice-HallofIndia(Pvt.) Ltd., NewDelhi
3. Wilson& Walker. Principles and Techniques in Practical B i o c h e m i s t r y . 5thEditionCambridgeUniversity Press (2000).
4. Murphy D.B. Fundamental of Light Microscopy & Electron Imaging.1st Edition.WileyLiss. (2001).
5. KLGhatak.Techniques andMethodsInBiologyPHIPublication(2011)
6. Pranav Kumar. Fundamentals and Techniques of Biophysics and Molecular Biology(2016)
7. AuroraBlair.Laboratory Techniques&ExperimentsinBiology.IntellizPress
8. D.T Plummer. An Introduction to Practical Biochemistry. McGraw Hill Publication1987
9. Beckner, W.M., Kleinsmith L.J and Hardin J. The world of cell. IV editionBenjamin/Cummings (2000)

VI. Co-CurricularActivities:

1. Competitioninperforminglaboratorytechniques likestaining
2. Artworkwithbacteriaor fungi inpetridish
3. Quizinidentifyingmicroscopictechniqueinvarious micrographs

COURSE8:-CELL BIOLOGYANDGENETICS
credits-_3

I. CourseOutcomes:

Bythe Completion ofthe coursethe learner should able to–

1. Understandcelltheory,cellorganelles,thecellcycle,andtheroleofthecytoskeleton.
2. Students will comprehend the structure and functions of the cell membrane,nuclear envelope, and nucleolus, as well as gain basic knowledge of cancerdevelopment.
3. Learnaboutproteinsorting,intracellularsignaltransductionpathways,programmedc ell death,stem cells, andspecializedchromosomes.
4. Gain knowledge of Mendelian genetics, including mono-hybrid and dihybridcrosses,inheritancepatterns, and allelefrequencies.
5. Understand the concepts of linkage, crossing over, the Hardy-Weinberg Law,natural selection, genetic drift, and the mechanisms of sex determination andinheritance.

Unit1 Hours :09

1. Cell theoryand cell organelles (Mitochondria, Chloroplasts,Lysosomes,Glyoxysomes andPeroxisomes, GolgiapparatusandER).
2. Cellcycleanditsregulation.
3. Cytoskeleton: Structure and organization of actin, myosin and intermediatefilaments,microtubules, and their role.

Unit2Hours : 09

1. Structure and functions Cell membrane, proton pumps associated (Na-K,Cacalmodulinetc.and theirdistribution), phagocytosis,pinocytosis, exocytosis.
2. Nuclear envelope, structure of nuclear pore complex, nuclear lamina, transportacrossnuclear membrane, Nucleolus.
3. Elementary knowledge of development and causes of cancer; Oncogenes andsuppressorgenes,

Unit3 Hours : 09

1. Protein sorting and Transport Intracellular signal transduction pathways (GPCR ,ERKPathway, mTOR Signaling)
2. ProgrammedCellDeath;Stemcells.
3. Specializedchromosomes(polytene,lampbrush)

UNIT4Hours : 09

1. MendalienGenetics , Mono hybrid and Dihybrid cross , Law of dominancesegregationandIndependent assortment.
2. Chromosometheoryofinheritance, Pedigree analysis, Incomplete dominanceandco-dominance,

3. Multiple alleles, Lethal alleles, Epistasis, Pleiotropy, Allele frequencies, Genotypefrequencies.

Unit– 5Hours : 09

1. Linkage and Crossing over, Molecular mechanism of crossing over. Recombinationfrequencyas ameasureof linkageintensity,
2. Hardy-Weinberg Law, roleofnaturalselection,Geneticdrift.Speciation
3. Sexdetermination–Sexlinkedinheritance, extrachromosomal Inheritance

SkillOutcomes:

Onsuccessfulcompletionofthecourse,the studentswillbeableto

1. Developproficiencyin cellcountingandviabilityassessment techniques.
2. Observe and analyze mitosis and meiosis in onion root tips, understanding theirstagesand significance.
3. Identifyandanalyzetheultrastructureofcellsthroughelectronmicrographs.
4. Recognizeandinterpretcancercellsthroughpermanentslidesorphotographs.
5. Understandgeneticconcepts like linkage, recombination, gene mapping,DNAfingerprinting, andpedigreechartanalysis

III SEMESTER

COURSE8:-CELLBIOLOGYANDGENETICS

credits-_1

1. CellcountingandViability
2. Mitosisfromonionroottips
3. Meiosisof onionroot tips
4. Study of ultrastructure of cell (Plasma membrane, Nucleus, Nuclear Pore Complex,Chloroplast,Mitochondrion, Golgi bodies, Lysosomes, SER and RER)
5. Identification and study of types of cancer, cancer cells by permanent slides/photographs.
6. Study of Linkage, recombination, gene mapping using marker-based data fromDrosophila.
7. DemonstrationofDNAfingerprinting.
8. Pedigreechartanalysis.

III. References:

1. A.J.F Griffiths, S. R Wessler, S. B Carroll & J. Doebley, An Introduction to GeneticAnalysis,.10th Ed., W.H. Freeman& Company (New York) 2010
2. GeoffreyM.Cooper andRobertE.Hausman-Thecellamolecularapproach.

3. BruceAlberts ,RebeccaHeald,et al. MolecularBiologyOfTheCell
4. Arnold Berk(Author),ChrisA. Kaiser (Author), HarveyLodish(Author),AngelikaAmon(Author), Molecular Cell Biology.
5. BenjaminLewinGenes
6. EldonJohnGardner,MichaelJ. Simmons,D. PeterSnustadPrinciplesof Genetics
7. KarpG,JohnWileyCellBiology
8. JaneB.Reece(Author),MarthaR.Taylor(Author),Eric J. Simon (Author),JeanL. Dickey , Campbell Biology:Conceptsand Connections
9. VeerBalaRastogi, GeneticsBDSingh,Genetics

IV. Co-CurricularActivities:

1. Laboratory demonstrations where students can observe and participate in variousexperimentsrelated to cell biology and genetics.
2. Guest Lectures: Invite experts and professionals from the field of cell biology andgenetics to deliver guest lectures. They can share their research, industry experiences,and advancements in the field, providing students with valuable insights and exposure toreal-worldapplications.
3. Seminars and Workshops on emerging areas, such as gene editing technologies, stemcellresearch, or personalized medicine
4. ResearchProjectonliteraturereviews,designingexperiments,andanalyzingdata.
5. Science Outreach Programs: Giving presentations at local schools, or creatingeducationalmaterials

IV SEMESTER

COURSE9:-MOLECULARBIOLOGYANDMICROBIAL GENETICS

credits-_3

I. CourseOutcomes:

Bythe Completionofthe coursethe learnershould able to–

1. Understand the nature of genetic material, its organization in prokaryotes and eukaryotes,andthe roleof DNAand RNA.
2. Explain the process of DNA replication in prokaryotes and the involvement of enzymes andfactors.
3. Recognize the characteristics, types, and applications of extra chromosomal geneticelementssuchas plasmidsand transposons.
4. Differentiate between classical and modern concepts of genes, understand gene structure,andthe processof transcription.
5. Comprehend the genetic code, translation process, and regulation of gene expression inbacteria.

6. Define and classify mutations, understand their molecular basis, and gain knowledge ofDNArepairmechanisms.
7. Familiarize with geneticrecombination in bacteria, includingconjugation,transformation, andtransductionprocesses.

Unit-1:DNA/RNAas geneticmaterial, ReplicationofDNA No. ofHours:9

ExperimentalevidencesthatestablishedDNAandRNAasgeneticmaterial.Genomeorganization in prokaryotes andeukaryotes.

Replication of DNA in prokaryotes.: Bidirectional and unidirectional replication,Semiconservative replication, Proof of Semiconservative replication (Messelson –Stahl Experiment). Mechanism of DNA Replication in Prokaryotes: step by stepprocess, Enzymes and factors involved in replication- Primase, Helicase, Gyrase,DNApolymerases,DNAligase, SSB proteins.

Extrachromosomalgeneticelements:Generalcharacters,typesandapplicationsofPlasmids and transposons.

Unit-2:Conceptofgene,Transcription No. ofHours:9

ClassicalConceptofgene:Muton,ReconandCistron;Onegene-oneenzymeandonegene-onepolypeptideand Onegene– OneProduct hypotheses.

Modern concept of gene: Definition of gene;Open reading frame; structural,constitutiveandregulatorygenes;uninterruptedgenes,Splitgenes-conceptofintronsand exons.

2,3ProteinsynthesisinProkaryotes:Transcription-Definition,differencefromreplication, promoter, RNA Polymerase, mechanism of transcription.RNA splicingineukaryotes;

Unit - 3: Translation and regulation of gene expressionNo. of

Hours:9Proteinsynthesis in Prokaryotes

Geneticcode:Salientfeatures,Wobblehypothesis.

Translation- Charging of tRNA, aminoacyl tRNA synthetases, Mechanisms ofinitiation,elongationandterminationofpolypeptides.Inhibitorsofproteinsynthesis.

Regulationofgeneexpressionin bacteria – lac operon.

Unit-4:MutationsandDNA repair No. ofHours:9

Mutations:Definitionand typesofMutations(Spontaneousandinduced,Somaticandgermline); Physical and chemicalmutagens;

Molecularbasisofmutations(basepairchanges,frameshifts,deletions,inversions, tandem duplications, insertions); Functional mutants (loss and gain offunctionmutants); Uses of mutations.

OutlinesofDNArepairmechanisms:Directrepair,Excisionrepair,MismatchRepair,Recombination Repair, SOS Repair.

Unit-5:Geneticrecombinationinbacteria **No. ofHours:9**

Conjugation- discovery,F-factor,F+ &Hfr,mechanismofconjugation,applicationsof conjugation;

Transformation- Discovery, mechanism of transformation, Competence Factorsaffectingtransformation and application oftransformation.

Transduction-discovery, mechanismandtypesoftransduction.

III. SkillOutcomes:

1. performing cell lysis and purification, quantifying DNA, and recognizing theimportanceof genomicDNA isolation.
2. Estimate DNA using UV Spectrophotometer include preparing DNA samples,measuring absorbance at 260 nm, calculating DNA concentration, and assessingDNApurity.
3. Solve Problems related to DNA and RNA characteristics, Transcription andTranslation. 4. Analyze and solve problems related to DNA and RNA structure,understanding transcription and translation processes, and interpreting the impact ofmutationson protein synthesis.
4. Prepare gels, loading DNA samples, visualizing DNA bands, analyzing fragmentsize,and understanding theprinciplesof electrophoresis.
5. Understand Mutagenesis principles, perform UV exposure, assessing mutationfrequency,andcomprehendtheeffectsofmutationsonbacterialphenotypes.

IVSEMESTER
COURSE9:-MOLECULARBIOLOGYANDMICROBIAL GENETICS
credits-1

1. IsolationofgenomicDNAfromE.coli
2. EstimationofDNAusingUVspectrophotometer(A260measurement).
3. ProblemsrelatedtoDNA andRNAcharacteristics,TranscriptionandTranslation.
4. ResolutionandvisualizationofDNAbyAgaroseGelElectrophoresis.
5. ProblemsrelatedtoDNA andRNAcharacteristics,TranscriptionandTranslation.
6. Inductionofmutationsinbacteriaby UVlight.
7. Studyofdifferentconformations ofplasmidDNAthrough agarosegelelectrophoresis.
8. Demonstrationofbacterialtransformation
9. Instrumentationinmolecularbiology–Ultracentrifuge,Transilluminator,PCR
10. StudyofdifferenttypesofDNAandRNAusingmicrographsandmodel/schematic
11. representations
12. Studyofsemi-conservativereplication of DNAthroughmicrographs/schematic
13. Representations

IV. References

Textbooks:

1. James D. Watson Tania A. Baker, Stephen P. Bell Alexander Gann, MichaelLevine, Richard Losick, 2013, Molecular Biology of the Gene, 5th Edition, PearsonEdu Publishers.
2. RogerY.Stanier,EdwardA.Adelberg,JohnL.Ingraham,1977,GeneralMicr obiology5th edition, LondonMacmillan.
3. DavidFreifelder1986MolecularBiology3rdedition, Jones& BartlettPublishers
4. T.A.Brown,GenecloningandDNAanalysis-An Introduction,4thedition
5. BernardR.GlickandJack.J.Pasternak, MolecularBiotechnology.3rd edition
6. David Freifelder.Essentials of molecular biology.Jones and Bartlett Publishers,1998

V. Co-CurricularActivities:

1. Conductposterpresentations,oralpresentations,andinteractivesessions.
2. Visitlaboratoriesemployingmolecularbiologytechniques

IVSEMESTER
COURSE10:-MICROBIALPHYSIOLOGYANDMETABOLISM
credits-_3

I. CourseOutcomes:

Onsuccessfulcompletionofthecourse,thestudentswillbeableto

1. Understandthenutritionalrequirementsofmicroorganismsandthedifferentmethods of nutrient uptake. They will also gain knowledge of different nutritionalgroupsand types ofgrowth media used formicrobial cultivation.

2. Comprehend microbial growth, including the definition of growth, generation time,and the different phases of growth. They will also learn about factors influencingmicrobialgrowth and methods formeasuring it.
3. Gainknowledgeofthermodynamicsinbiologicalsystems,includingconceptsoffree energy, enthalpy, and entropy. They will also learn about ATP structure andproperties,oxidation-reductionreactions,andcarbohydratebreakdownpathways.
4. Understandmicrobialrespiration,includingaerobicandanaerobicrespiration,chemoauto trophy,andfermentative modes.
5. Differentiate theprocesses ofoxygenicand anoxygenicphotosynthesis.

UNITI:Microbial Nutrition No. ofhours:9

1. Nutritionalrequirements ofMicroorganisms
2. Methods of uptake of nutrients by cells- Primary and secondary active transport,conceptofuniport, symportand antiportGrouptranslocation;Ironuptake
3. Nutritionalgroupsofmicroorganisms-basedonC,energyand electron.sources
4. Growth media - synthetic, nonsynthetic, selective, enrichment and differentialmedia.

UNITII: MicrobialGrowth No. ofhours:9

1. Microbial Growth- Definitions of growth, generation time and specific growth rate;differentphases of growth in batch cultures;
2. Synchronous,continuous,biphasicgrowth.
3. Factorsinfluencingmicrobialgrowth
4. Methods for measuring microbial growth - Direct microscopy, viable countestimates,turbidometry and biomass.

UNITIV:Thermodynamics;BreakdownofCarbohydrates No.ofhours:9

1. Thermodynamics in biological systems - Concept of free energy, Enthalpy, Standard FreeEnergy change of reaction, Entropy. First and Second law of Thermodynamics. Open andClosed system.
2. Structure and properties of ATP, Standard Free energy change of hydrolysis of ATP andother high energy compounds. Biological oxidation-reduction reactions. Structure andFunctionofNAD andFAD.
3. Breakdown of carbohydrates· Glycolytic pathways- EMP, HMP shunt/pentose phosphatepathwayand ED; TCA cycle.

UNITV:MicrobialRespirationandFermentation No.ofhours: 9

1. Aerobicrespiration -ETSand oxidativephosphorylation
2. Anaerobicrespiration,chemoautotrophy-oxidationofinorganiccompounds-N,S,FeandH.

3. Fermentative modes in microorganisms with special reference to alcoholic, Lacticacidfermentations

UNITV:BacterialPhotosynthesis **No. ofhours:9**

1. Photosyntheticpigments,Photosyntheticapparatusinprokaryotes
2. Outlineofoxygenicphotosynthesisinbacteria
3. Outlineofanoxygenicphotosynthesisinbacteria

II. SkillOutcomes:

Onsuccessfulcompletionofthecourse,the studentswillbeableto

1. Understandtheimpactoftemperatureandp Hon bacterialgrowthandmetabolism.
2. Gainproficiencyincolonycounting techniquesformicrobialenumeration.
3. Analyzeandinterpretgrowthcurvedatatounderstandbacterialgrowth dynamics.
4. Developskillsinobservingandidentifyingcyanobacteriaunderthemicroscope.
5. Apply knowledge of microbial growth factors and techniques to interpret and analyzeexperimentalresults.

IVSEMESTER
COURSE10:-MICROBIALPHYSIOLOGYANDMETABOLISM
credits-1

1. EffectofTemperatureonbacterialgrowth2.EffectofpHonbacterialgrowth
2. Colonycount in Plates
3. Study and plot the growth curve of E. coli by turbidometric and standard plate countmethods
4. Observationandidentification ofpermanentslides ofcyanobacteria

IV References:

1. Berg JM, Tymoczko JL and Stryer L (2011) Biochemistry, W.H.Freeman andCompany Caldwell, D.R. (1995). Microbial Physiology and Metabolism, W.C. BrownPublications,Iowa,USA.
2. Lehninger, A.L., Nelson, D.L. and Cox, M.M. (1993). Principles of Biochemistry, 2ndEdition, CBS Publishers andDistributors, New Delhi.
3. Sashidhara Rao, B. and Deshpande, V. (2007). Experimental Biochemistry: A studentCompanion.I.K.International Pvt. Ltd.
4. Tymoczko JL, Berg JM and Stryer L (2012) Biochemistry: A short course, 2nd ed.,W.H.Freeman
5. Voet,D.andVoet J.G(2004)Biochemistry3rdedition, JohnWiley andSons
6. White, D. (1995). The Physiology and Biochemistry of Prokaryotes, OxfordUniversityPress, New York.

V Co-CurricularActivities:

1. Assignmentsinnutrient utilization,energyproduction,metabolicpathways,

2. Studentscanstudymicrobialgrowthcurves,metabolicpathways,orphysiologicalresponses to environmentalfactors.

3. Organizeseminarswherestudentscandeliverpresentationsonspecifictopicsinmicrobial physiology andmetabolism.

4. Createvisualrepresentationsofmicrobialmetabolicpathways.

IVSEMESTER

COURSE11:rDNATECHNOLOGY,BIOINFORMATICSANDBIOSTATISTICS

credits-_3

I. CourseOutcomes:

Onsuccessfulcompletion ofthecourse,thestudents willbeableto

1. Learntheprinciples andtechniques ofgeneticengineering, includingg restrictionendonucleases,and DNAtransformation.
2. Understandtheuseofvectors andthebasics ofpolymerasechainreacti alsoexploretheapplicationsof geneticengineering inindustry, agr medicine.
3. Gainknowledgeof blottingtechniques, DNAlabeling, DNAsequencbasics ofintellectualpropertyrights.
4. Learnaboutbioinformaticresources,sequencedatabases,sequencealignuseofbiostatisticsindata analysis.
5. Developskillsinmeasuringcentraltendencyand dispersion,understandtypesofdata, andutilizingbiostatistical softwarefor analysis and data pr

UNIT-I:RecombinantDNATechnology No. ofHours: 9

1. Basicprinciplesofgeneticengineering. Stepsin genecloning.
2. RestrictionendonucleasesapplicationsofType IIrestrictionenzymesingeneticengineering;DNApolymerasesandligases;Use of linkersand adaptors
3. Vectors–Cosmid,Bacteriophages,BAC,YAC
4. TransformationofDNAbyChemicalmethod,Electroporation.

UNIT-II:Applicationsofr-DNA technology No. ofHours: 9

1. GenomicandC-DNALibraries,RFLP,RAPD,
2. BasicsofPolymerasechainReaction
3. Applicationofgeneticengineeringinindustry,agricultureandmedicine,HybirdomaTechnolo gy.

UNIT-III:Techniquesin geneticengineering andIPR No. ofHours: 9

1. BlottingTechniques.
2. LabelingofDNA, DNA footprinting.
3. DNASequencing-Sanger'smethod
4. Outlinesof IntellectualpropertyRights(Patents,Trademark,Copyright)

UNIT-IV:Bioinformatics No. ofHours: 9

1. Bioinformaticresources:NCBI,EBI,DDBJ,PUBMED,BIOMED.

2. SequenceDatabases–GENBANK,BLAST,FASTA,ExPasy,PDB,NDB,UNIPROT–SWISSPROT.
3. Sequencealignment–Sequence homology,pairwisesequence alignment,automatedDNAsequencing, ChIP.

UNIT-V:Biostatistics **No. ofHours: 9**

1. Measurementofcentraltendency:MEAN,MEDIAN,MODE.
2. Measurement of dispersion : RANGE, MEANDEVIATION,STANDARDDEVIATION.
3. UseofBiostatisticsoftwares.
4. Sampleandpopulation;Typesof Data ,methodsofDatapresentation.

III. SkillOutcomes:On successfulcompletion ofthecourse,thestudentwill beable to

1. Performplasmid DNAisolation, agarosegel electrophoresis
2. UnderstandtheprinciplesandapplicationsofDNAfingerprintingforgeneticprofilingandidentification.
3. Utilizenucleicacidandproteindatabasestoaccess,retrieve,andanalyzegeneticandproteinsequence information
4. Applysequencealignment algorithmsand tools
5. Developskillsusingbioinformaticstoolsanddatabases

IVSEMESTER
COURSE11:rDNATECHNOLOGY,BIOINFORMATICSANDBIOSTATISTICS
credits-1

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1. Isolationofplasmid DNAbyAgarosegelElectrophoresis.
2. PreparationofRecombinantvectorbyusingT4DNALigase.
3. ToUnderstandtheconceptofDNAfingerprintingbyRandomAmpilificationofPolymorphicDNA.
4. Nucleicacidandprotein databases.
5. Sequencealignment
6. SequencehomologyandGeneannotation.

References

1. GhoshZ.andBibekanandM.(2008)Bioinformatics:PrinciplesandApplications.OxfordUniversity Press.
2. Pevsner J. (2009) Bioinformatics and Functional Genomics. II Edition. Wiley-Blackwell.3.CampbellA.M.,HeyerL.J. (2006) DiscoveringGenomics, ProteomicsandBioinformatics. IIEdition.BenjaminCummings.CruegerW,CruegerA(1990)

Biotechnology: A text Book of Industrial Microbiology 2nd edition Sinauerassociates,Inc.

3. Demain,A.LandDavies,J.E.(1999).Manualof IndustrialMicrobiologyandBiotechnology,2nd Edition, ASM Press.
4. Glazer AN and Nikaido H (2007) Microbial Biotechnology, 2nd edition, CambridgeUniversity Press Glick BR, Pasternak JJ, and Patten CL (2010) MolecularBiotechnology4thedition,ASMPressGuptaPK(2009)ElementsofBiotechnology2ndedition, Rastogi Publications
5. Prescott, Harley and Klein's Microbiology by Willey JM, Sherwood LM, WoolvertonCJ(2014), 9th edition, McGraw Hill Publishers.
6. Ratledge,CandKristiansen,B.(2001).BasicBiotechnology,2ndEdition,CambridgeUniversityPress.
7. StanburyPF,Whitaker A,HallSJ(1995)PrinciplesofFermentationTechnology2ndedition.,ElsevierScience
8. Swartz,J.R.(2001).AdvancesinEscherichia coliproductionoftherapeutic proteins.CurrentOpinion in Biotechnology, 12, 195–201.

V Co–curricularActivities:

1. Trainingofstudentsandbasicgenecloningmethods.
2. IndustrialvisitonRecombinantproducts.
3. Prepearationofvideoson labelingofDNAandDNAsequencing.
4. Studentsparticipationinseminarsofthe copyright,Patent,TrademarkandIPR.
5. Assignments on PCR, Restriction enzymes , vectors , RFLP, RAPD, HybridomaTechnology,SequencealignmenttoolsofDNA,centraltendancy,Datacollectionandpresentation.
6. Conductinggroupdiscussion,Quiz,debateinrelatedtopics.

VSEMESTER
COURSE12A:IMMUNOLOGYANDMEDICALMICROBIOLOGY

credits-3

ICourseoutcomes:

Bythe Completion ofthe coursethe learner should able to–

1. Describe the key concepts in Immunology and how the immune system is able todiscriminateself vs. non-self
2. Explain how the innate and adaptive immune systems work together to generate aneffectiveimmune responseagainst aspecificpathogen.
3. Explainhowthe immunesystem isable torespond toso manydiverseantigens.
4. To understand the importance of pathogenic microorganisms in human disease withrespecttoinfectionsoftherespiratorytract,gastrointestinaltract, urinarytractetc
5. To understand and able to correlate disease symptoms with causative agent, isolateandidentify pathogens.

Unit-1:**ImmuneSystem** **No. ofHours:9**

1. Conceptof Innate andAdaptiveimmunity
2. Primaryandsecondaryorgansofimmunesystem- thymus,bursafabricius,bonemarrow,spleen, lymph nodes and lymphoid tissues
3. Cells of immune system- Identification and function of B and T lymphocytes, nullcells, monocytes, macrophages, neutrophils, basophils and eosinophils Componentsofinnate immunity;Complement system (in brief)

Unit-2:**Immuneresponse** No.ofHours9

1. Characteristics of antigen (Foreignness, Molecular size, Heterogeneity andsolubility)haptens.
2. Antibodies -basic structureand types.
3. **Generation of Immune Response - Primary and Secondary Generation ofHumoral Immune Response (Plasma and Memory cells), MHC Generation ofCellMediated ImmuneResponse**
4. Immune complex formation and elimination - Agglutination,Precipitation,Neutralisation, Complement fixation,Phagocytosis
5. Hypersensitivity-definitionandtypes(inbrief)

Unit-3: MicrobesinHealthandDisease **No. ofHours:9**

1. Normalfloraof humanbody.
2. Definitions - Infection, Invasion, Pathogen, Pathogenicity, Virulence,Toxigenicity,Opportunisticinfections, Nosocomialinfections.

3. General account on microbial diseases - causal organism, pathogenesis,epidemiology,diagnosis, prevention and control ofthefollowing Bacterial diseases - Tuberculosis, Typhoid, Botulism Fungal diseases - Candidiasis.ViralDiseases-Hepatitis-A and AIDS

Unit - 4: PrinciplesofDiagnosis **No. ofHours:9**

1. Generalprinciplesofdiagnosticmicrobiology-Collection,transportofclinicalsamples
2. Identificationbyculturing
3. Identificationbybiochemical/physiologicalproperties
4. Identificationbymolecularassays(PCR,DNAprobes)
5. Identificationbyserologicaltests(ELISA,Immunofluorescence,Agglutinationbasedtests, Complement fixation)

Unit-5:PreventionandTreatment **No. ofHours:9**

1. Vaccines-Active(Naturalandrecombinant)andpassive
2. Antimicrobialagents-Generalmodesofactionofantibacterial(Penicillin,Streptomycin),antifungal(AmphotericinandGriseofulvin),antiviral(Amantadine,Acyclovir)agents
3. Interferons
4. Antibioticresistance-Testsforantimicrobialsusceptibility(Discdiffusion)

II SkillOutcomes:

By the completion of the course the learner should able to–

1.Performsomeofthe ag-ab reactions
2. Carryoutthebiochemicaltestsusefulforidentificationofofbacteria
3. Performantibioticsensitivitytest
4. Identifysomecommon symptomsand relatethemtoetiology
5. Preparesome differentialmediaroutinelyusedforidentificationofbacteria

VSEMESTER

COURSE12A:IMMUNOLOGYANDMEDICALMICROBIOLOGY

credits-1

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1. Identificationofhumanbloodgroups.
2. Separateserumfromthe bloodsample (demonstration).
3. ImmunodiffusionbyOuchterlonymethod.
4. Identificationofanyofthebacteria(E.coli,Pseudomonas,Staphylococcus,Bacillus)using laboratorystrainsonthebasisofcultural,morphologicalandbiochemicalcharacteristics: IMViC, ureaseproduction and catalasetests
5. Studyofcompositionanduseofimportantdifferentialmediafor identificationof

6. bacteria: EMB Agar, McConkey agar, Mannitol salt agar, Deoxycholate citrate agar,TCBSIsolation of bacterial floraof skin byswabmethod.
7. AntibacterialsensitivitybyKirby-Bauermethod
8. Determinationofminimalinhibitoryconcentrationofanantibiotic
9. Studysymptomsofthediseaseswiththehelpofphotographs:Anthrax,Polio,Herpes,chicken pox, HPVwarts, Dermatomycoses (ringworms)
10. Isolation of Normal flora of human body (Hands, Feet, Nostrils, Teeth Surface) byswabmethod.

III References

1. AnanthanarayanR.andPanikerC.K.J.(2009)TextbookofMicrobiology.8thedition,University Press Publication.
2. Brooks G.F., Carroll K.C., Butel J.S., Morse S.A. and Mietzner, T.A. (2013) Jawetz,MelnickandAdelberg'sMedicalMicrobiology.26thedition.McGrawHillPublication.
3. Delves P, Martin S, Burton D, Roitt IM. (2006). Roitt's Essential Immunology.11theditionWiley-BlackwellScientificPublication, Oxford.
4. Goldsby RA, Kindt TJ, Osborne BA. (2007). Kuby's Immunology. 6th edition W.H.Freemanand Company,New York.
5. Kuby's Immunology.6theditionW.H.Freeman andCompany,NewYork.
6. Jawetz, Melnick and Adelberg's Medical Microbiology. 26th edition. McGraw HillMicrobiology.4th edition. Elsevier Publication.
7. Willey JM, Sherwood LM, and Woolverton CJ. (2013) Prescott, Harley and Klein'sMicrobiology. 9th edition. McGraw Hill Higher Education Practical microbiology-M.N.ReddyPractical microbiology-M.N.Reddy
8. Microbiology:alaboratorymanual/JamesG.Cappuccino,Natalie.
9. PlantpathologyandMicrobiology-K.R.Aneja
10. Mackie&MccartneyPracticalMedicalMicrobiology,

VI. Co-CurricularActivities:

1. ScreeningofBloodgroups
2. VisittoDiagnostic/Laboratory
3. Competitiononcompositionandsterilemediapreparation
4. CompetitiononIsolationand Identificationofbacteriafromasample

VSEMESTER

COURSE12B:PHARMACEUTICALMICROBIOLOGY

credits-3

CourseOutcomes:

Oncompletion ofthe coursethelearner should able to–

1. Explaintheprinciplesofbiosafetycabinetsandbiologicalwastemanagement
2. Explainthemethodsofdetectionofmicroorganismsinphamaceuticals.
3. Explain the molecular methods of detection of pathogens for qualitycontrol
4. Design/select specific media for identification of microbes inpharmaceuticalproducts
5. Practicesafetyprinciples

Unit1:Introduction toPharmaceuticalMicrobiologyNo. ofHours:9

1. Significance of microbiology in the pharmaceutical industry; Microbialcontaminationand spoilageof pharmaceutical products.
2. OverviewofcurrentGoodManufacturingPractices(cGMP)andregulatoryrequirements.
3. Principlesofasepticteчniquesandcleanrooms,BSL

Unit2:MicrobialControlinPharmaceuticals No. ofHours: 9

1. Sterilizationmethods:physicalandchemicalsterilizationtechniques.
2. Sterilitytesting:principles,methods,andinterpretationofresults.
3. Disinfection methods: types of disinfectants, their modes of action, andapplications.
4. Microbial preservation of pharmaceutical products: antimicrobial agents and theirefficacy.

Unit3:MicroorganismsofPharmaceuticalImportance No. ofHours: 9

1. Identification and characteristics of microorganisms commonly found inpharmaceuticalenvironments.
2. Pathogenicmicroorganismsandtheirsignificance inpharmaceuticalproducts.
3. Environmentalmonitoringandmicrobialenumerationtechniques;Bioburdentestingandits importance

Unit4:MicrobialQualityControl No. ofHours:9

1. Validationandqualificationofmanufacturingprocessesandequipment.
2. Controlofrawmaterials,water,and airqualityinpharmaceuticalproduction.

3. Qualitycontroltestingformicrobial limits,endotoxinlevels,andbioburden.
4. Environmentalmonitoringandtrendanalysisinpharmaceuticalfacilities.

Unit5:MicrobiologyinProductDevelopment **No. ofHours: 9**

1. Microbialaspectsofproduct developmentandformulation.
2. Microbialstabilitytestingofpharmaceuticalproducts.
3. Microbialassaysforantibioticsandotherpharmaceutical substances.
4. Microbialqualitycontrolinvaccineproduction.

SkillOutcomes: By thecompletion ofthe coursethe learnershould ableto–

1. Performsterilitytestsfor equipment.
2. Employdisinfectionmethodsofselectedinstruments
3. Performsterilitytest ofairin the lab
4. Testthesterilityofmicrobiologicalmedia
5. Testthesterilityofpharmaceuticalproducts

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COURSE12B:PHARMACEUTICALMICROBIOLOGY
credits-1

1. SterilitytestsforInstruments–Autoclave&HotAirOven
2. Disinfectionofselectedinstruments&Equipments
3. SterilitytestofAirin Laboratory.
4. SterilitytestingofMicrobiologicalmedia
5. SterilitytestingofPharmaceuticalproducts –Antibiotics,Vaccines&fluids
6. Standardqualitativeanalysisofwater.
7. AnalysisoffoodsamplesforMycotoxins

III. References

1. HarriganWF(1998)LaboratoryMethodsinFoodMicrobiology,3rded.AcademicPress
2. Garg N,GargKLandMukerjiKG(2010) LaboratoryManualof FoodMicrobiologyIKInternational Publishing HousePvt. Ltd.
3. JayJM,LoessnerMJ,GoldenDA(2005)ModernFoodMicrobiology,7thedition.Springer
4. BairdRM,HodgesNAandDenyerSP(2005)HandbookofMicrobiologicalQualitycontrol inPharmaceutical andMedical Devices,TaylorandFrancisInc.
5. Microbiology-Alaboratorymanual,Cappuccino&Sherman,6thEd,PearsonEducation
6. Manualofdiagnosticmicrobiology,Dr.B.J.Wadher&Dr.G.L.Bhoosreddy,First
7. .Ed.,Himalayapublishinghouse, Nagpur.
8. PharmaceuticalMicrobiology–W.B.Hugo
9. PharmaceuticalMicrobiology–Purohit
10. LaboratoryExercisesinMicrobiology,George.A.Wistreich&Max.D.Lechtman,3rdEd, Glencoepress, London.

IV. Co-CurricularActivities:

1. VisittopharmaceuticalCompany
2. Projecton QCand QAmethods inpharma
3. AssignmentsoncollectingSoPsfromPharma labs

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COURSE13A:APPLIEDMICROBIOLOGY
credits-3

I. CourseOutcomes:

Bythe completionofthe coursethe learner shouldable to–

1. Identifytheareasof entrepreneurship,and assessthescopeforestablishment.
2. Explainproductionoffermentationproductsandeconomics
3. Explaintheproductionmethod ofbiofertilisers andmushrooms
4. Explaintheprocessof bakingandbrewing
5. PrepareDPRandunderstandpatenting

Unit–I:Entrepreneurialskill **No ofHours: 9**

Entrepreneurial skills–Institutes involved, Government support to entrepreneurs, Incubationcenters, risk assessment. Scope for small, medium and Large scale industries inMicrobiology

Unit–II:Fermentation ProductsNoofHours:9

1. Microbialcellsasfermentationproducts-
2. Bakers yeast, food and feed yeasts, SCP, Bacterial Insecticides, Legume Inoculants,Algae.
3. Enzymesasfermentation products–
4. Bacterial and Fungal Amylases, Proteolytic Enzymes, Pectinases, Invertases, andotherenzymes
5. FermentationEconomics

Unit–III:Bio-fertilisers andMushroomsNoofHours:9

1. Mushroomcultivation–CultivationofAgaricuscampestris,Calocybaindica,Agaricus bisporus, and Volvariella volvaciae; Preparation of compost, filling traybeds,spawning,maintaingoptimaltemperature,casing,watering,harvesting,storage.
2. Biofertilizers –Chemical fertilizers versus biofertilizers, organic farming. Productionofbiofertilisers-Rhizobium sp, Azospirillumsp,Azotobactersp.
3. Microbialconsortiaforcompostingandasbiofertilisers

Unit–IV:BakingandBrewingprocessesNoofHours:9

Brewing–Media components, preparation of medium, Microorganisms involved,maturation, carbonation,packaging,keepingquality,contamination,byproducts.Breadmaking-Yeastactivation,

Unit–V:DPRandPatents **No ofHours: 9**

1. PreparationofDPR(DetailedProjectReport)
2. Patents and secret processes –History of patenting, composition, subject matter andcharacteristicsofapatent, Inventor,Infringement,cost of patent

SkillOutcomes:

Bythe completionofthe coursethe learner shouldable to–

1. PrepareMicrobialconsortiaforcomposting
2. Preparareporton theworkingofproduction unitofmushrooms/biofertiliser
3. PreparesampleDPR

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COURSE13A:APPLIEDMICROBIOLOGY

credits-1

1. PreparationofMicrobialconsortiafor composting
2. Field visit and report preparation of Mushroom cultivation unit/ Biofertiliserproductioncentre/or anyother
3. PreparationofsampleDPR

References:

1. EntrepreneurialDevelopmentinIndia-ByArora.
2. Sathyanarayana.U,Biotechnology.(2005)1stEd.BooksandAllied(P)Ltd.
3. Casida,LEJR,(2019). Industrial Microbiology.NewAge InternationalPublishers
4. K.R.Aneja,ExperimentsinMicrobiology,Plantpathology,Tissuecultureand Mushroomproductiontechnology,6thEd.SChandPublication
5. NdukaOkafor.ModernIndustrialMicrobiologyandBiotechnology.2007.CRCPre s s
6. MichaelJ.Waites,NeilL.Morgan,JohnS.Rockey,GaryHigton.IndustrialMicrobio logy: AnIntroduction.2013.WileyBlackwellPublishers.
7. A.H.Patel.IndustrialMicrobiology.2016.2ndEd.LaxmiPublications,NewDelhi.
8. DubeyRC.ATextbookofBiotechnology.(2014).SChandPublishers.

9. RobertD.Hisrich,MichaelP.Peters,“EntrepreneurshipDevelopment”,TataMcGrawHill

II. Co-CurricularActivities:

1. Preparefermentedfoods
2. Workshoponproject reportpreparationofmushroomcultivationunit
3. Visittoindustryproducingmicrobialproducts

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COURSE13B:DIAGNOSTICMICROBIOLOGY

credits-3

CourseOutcomes:

Bythecompletionof thecoursethelearnershouldableto

1. Todifferentiateandexplain variousmethodsofstaining andmediapreparation.
2. Explain the principle and application of serological and molecular methods ofdiagnosis
3. Safeguardoneself andcommunityfromantibioticmisuse.
4. Analysetheincidence,distributionanddeterminantsofdiseases.
5. Toexecutethemethodsofpreventionofvariousinfectiousdiseases

Syllabus:

UNIT-I:Collection of Clinical SamplesNo.ofhours:9

1. Clinicalsamplesassociatedwithvariousinfectiousdiseases
2. Collectionofclinicalsamples(oralcavity,throat,skin,blood,CSF,urineandfaeces)and precautions required.
3. Methodoftransportofclinicalsamplestolaboratoryandstorage.4.Laboratoryacquiredinfections, safety of laboratoryworkers

UNIT-II:Microscopic and culturemethods ofDiagnosis No. of hours:9

1. Examinationofsamplebystaining-Gramstain,Ziehl-Neelsonstainingfortuberculosis,Giemsa-stained thin blood film formalaria
2. Preparationanduseofculturemedia-Bloodagar,Chocolateagar,Lowenstein-Jensenmedium, MacConkey agar
3. Distinctcolonypropertiesofvariousbacterialpathogens.

UNIT- III: Serological and molecular methods of

DiagnosisNo.ofhours: 9

1. Agglutination,ELISA,immunofluorescence

2. PCRandItsVariationsReal-TimeandDigitalPCRforNucleicAcidQuantification;MultiplexPCR forDetection andIdentification of Microbial Pathogens
3. NonamplifiedProbe-BasedMicrobialDetectionandIdentification

UNIT-IV:Antimicrobials-sensitivityandresistance No. ofhours:9

1. Importanceofdrugresistance
2. Determinationofresistance/sensitivityofbacteriausingdiscdiffusionmethod
3. Determination of minimal inhibitory concentration (MIC) of an antibiotic byserialdoubledilution method

UNIT- V: Advances in Diagnostic Microbiology No. of hours:91.Metagenomic studies for Pathogen Detection and Identification2.TranscriptomicTechniques in Diagnostic Microbiology

3.DevelopmentsinmoleculartestsfordetectingTBand anti-TBdrugresistance.

SkillOutcomes:

1. Collect,labelandtransportclinicalspecimens
2. Isolatepureculture of bacteria
3. Toidentifycommonbacteria
4. Tomaintainandpreservestockculture

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COURSE13B:DIAGNOSTICMICROBIOLOGY
credits-1

1. Collection transport and processing of clinical specimens (Blood, Urine, Stool andSputum).
2. Receipts, Labeling, recording and dispatching clinical specimens. 3 . Isolation ofbacteriain pureculture and Antibioticsensitivity.
3. Identification of common bacteria by studying their morphology, cultural characters,Biochemicalreactions, slide agglutination andother tests.
4. Maintenanceandpreservationofstockculture.

References

1. Ananthanarayan R and Paniker CKJ (2009)Textbook of Microbiology, 8th edition,UniversitiesPress PrivateLtd.

2. Brooks G.F., Carroll K.C., Butel J.S., Morse S.A. and Mietzner, T.A. (2013) Jawetz,Melnick and Adelberg's Medical Microbiology. 26th edition. McGraw HillPublication.
3. Randhawa, VS, Mehta G and Sharma KB (2009) Practicals and Viva in MedicalMicrobiology2nd edition, Elsevier India Pvt Ltd.
4. Tille P (2013) Bailey's and Scott's Diagnostic Microbiology, 13th edition, Mosby. 5.Collee JG, Fraser, AG, Marmion, BP, Simmons A (2007) Mackie and MccartneyPracticalMedical Microbiology, 14th edition, Elsevier.

Co-CurricularActivities:

1. Hands-on training in techniques such as sample collection, microbial culture,staining, identification methods (e.g., biochemical tests), and antimicrobialsusceptibilitytesting.
2. Case Study Analysis individually or in groups to evaluate patient histories,laboratorytest results, anddiagnosticdata to reachadiagnosis.
3. Projectworkoncomparingreportsfromdifferentdiagnosticlabs

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COURSE14A:INDUSTRIALMICROBIOLOGY
credits-3

CourseOutcomes:

Bythe Completion of thecourse,the learner should able to–

1. Recognizevariousindustriallyimportantmicroorganisms
2. Identifythemethodsofscreeningofrequiredmicroorganisms
3. Identifytheappropriate methodsoffermentationtobeadaptedforproductions
4. Discussthebasicconceptsinindustrialmicrobiology,industriallyimportantmicrobesand metabolites
5. Explainthecomponentsofupstreamanddownstreambioprocessing

UNITI:Microorganismsofindustrialimportance No. ofhours:9

1. Briefhistoryanddevelopmentsinindustrialmicrobiology.
2. Microorganisms of industrial importance -yeasts (Saccharomyces cerevisiae), molds(Aspergillusniger)bacteria(E.coli),actinomycetes(Streptomyces griseus).
3. Industrially important Primary and secondary microbial metabolites- Techniquesinvolvedinselectionofindustriallyimportantmetabolitesfrommicrobes.

UNITII:ScreeningandStrain Improvement No. ofhours:9

1. Primaryandsecondaryscreening.Preservationand maintenanceofindustrialstrains
2. Outlinesofstrainimprovement.
3. Fermentation media (Crude and synthetic media; molasses, corn- steep liquor,sulphitewaste liquor,whey, yeast extractand proteinhydrolysates)

UNITIII:Bioreactors No.ofhours: 9

1. Componentsofatypicalcontinuouslystirredtankbioreactor.
2. Typesoffermenters–laboratory,pilot-scaleand productionfermenters.
3. Typesoffermentationprocesses-solidstate,liquidstate;batch,fed-batch,continuous;aerobic, anaerobic; submerged,surface

UNITIV:FermentationandDownstreamprocesses No.ofhours: 9

1. Measurementandcontroloffermentationparameters- pH,temperature,dissolvedoxygen,foaming and aeration
2. Downstream processing - filtration, centrifugation, cell disruption, solventextraction.

3. Methodsofimmobilization,advantagesandapplicationsofimmobilization,largescaleapplications of immobilizedenzymes.

UNITV:MicrobialProductions **No. ofhours: 9**

1. Productionofcitricacid,ethanolandpenicillin.
2. ProductionofGlutamicacid andvitamin B12
3. Industrialproductionand usesofamylases,proteases,lipasesandcellulases.

SkillOutcomes:

Bythe completionofthe coursethe learner shouldable to–

1. Comprehend the significance of and demonstrate microbial diversity by isolatingmicroorganismsfrom natural environments.
2. Microscopically demonstrate the microorganisms found in fermented food; preparesome of the fermented products(wine) in the laboratory to observe the associatedphysicaland chemical changes.
3. Carryoutmicrobialproductionsinsmallscale(citricacid) andestimatethe product

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COURSE14AINDUSTRIALMICROBIOLOGY
credits-1

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1. Microbialfermentationfortheproductionandestimationofethanol
2. Isolationofamylaseproducingmicroorganismsfromsoil
3. Productionofamylasefrombacteriaandfungi
4. Assayofamylase
5. Demonstrationoffermenter
6. Productionofwinefromgrapes
7. Growthcurveandkineticsofanytwoindustriallyimportantmicroorganisms.
8. Microbialfermentationfortheproduction andestimationofcitricacid

References:

1. Stanbury,P.F.,Whitaker,A.andHall,S.J.(1997). Principles ofFermentationTechnology, AdityaBooks (P) Ltd.NewDelhi.
2. Doyle,M.P.,Beuchat, L.R.andMontville,T.J.(1997). FoodMicrobiology:Fundamentals andFrontiers.ASM Press,Washington D.C.,USA.

Co-CurricularActivities:

1. Lectures/Seminaron currenttrendsinindustrialmicrobiology

2. Fieldvisit torelatedindustry
3. Assignmentson identifying and procuring industrially importantmicroorganisms

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COURSE14B:AGRICULTURALMICROBIOLOGY

credits-3

COURSEOUTCOMES:

Bythecompletion ofthe coursethe learnershould ableto

1. SoilMicrobiology:Studysoilasamicrobialhabitat,diversityofmicroorganisms,and theirinteractions.
2. HostPathogenInteraction:Understandmicrobialpathogenicity,virulencefactors,and plant defensemechanisms.
3. Control of Plant Diseases: Learn principles and practices for managing plantdiseases,includingregulatory,cultural,chemical,andbiologicalmethods.
4. SpecificPlantDiseases:Studyimportantplantdiseasescausedbyfungi,bacteria,viruses,andviroids,focusingontheiretiology,symptoms,epidemiology,and control.
5. Biofertilization,Phytostimulation,Bioinsecticides:Exploreplantgrowth-promoting bacteria, biofertilizers, mycorrhizae, and their role in enhancingplant growth. Learn about bioinsecticides and their advantages over syntheticpesticides.

Unit1:SoilMicrobiology **No ofHours:9**

1. Soil as Microbial Habitat, Soil profile and properties, Soil formation, Diversityanddistribution of microorganisms insoil.
2. Mineralizationofcellulose,hemicelluloses,lignocelluloses,ligninandhumus.
3. Microbeinteractions:Mutualism,synergism,commensalism,competition,amensalism, parasitism, predation. Microbe-Plant interaction: Symbiotic andnonsymbioticinteractions.

Unit2:HostPathogenInteraction **No. ofHours:9**

1. Microbial Pathogenicity Virulence factors of pathogens: enzymes, toxins (hostspecificandnonspecific)growthregulators.Virulencefactorsinviruses(replicase,coat protein,silencing suppressors)indiseasedevelopment.
2. Effectsofpathogensonhostphysiologicalprocesses(photosynthesis,respiration, cell membrane permeability, translocation of water and nutrients,plantgrowthandreproduction).
3. Defence Mechanisms in Plants: Concepts of constitutive defense mechanismsinplants,induciblestructuraldefences(histologicalcorklayer,abscissionlayer, tyloses, gums), inducible biochemical defences [hypersensitive response(HR), systemic acquired resistance (SAR), phytoalexins, pathogenesis related(PR)proteins, plantibodies, phenolics,quinones,oxidativebursts].

Unit3:Control ofPlantDiseases No.ofHours:9

1. Principles&practicesinvolvedinthemanagementofplantdiseasesbydifferent methods, viz. regulatory - quarantine, crop certification, avoidance ofpathogen,useofpathogenfreepropagativematerial,cultural-hosteradication,croprotation,sanitation,polyethylenetrapsandmulcheschemical-protectantsand systemicfungicides, antibiotics,resistance
2. ofpathogenstochemicals.biological-suppressivesoils,antagonisticmicrobes-bacteriaand fungi, trapplants
3. genetic engineering of disease resistant plants- with plant derived genes andpathogenderived genesand GeneticallyModifiedcrops.

Unit:4: Study ofPlant diseases No. ofHours:9 Study ofsomeimportantplantdiseasesgivingemphasisonitsetiologicalagent, symptoms, epidemiology andcontrol

1. Importantdiseasescausedbyfungi

a. Blackstemrustofwheat-*Pucciniagraministritici*
b. Wiltoftomato-*Fusariumoxysporumf.sp.lycopersici*
c. Earlyblight ofpotato-*Alternariasolani*

2. Importantdiseasescausedbyphytopathogenicbacteria:

   Angular leaf spot of cotton, bacterial leaf blight of rice, crown galls, bacterialcankersof citrus
3. Important diseases caused by viruses: Papaya ring spot, tomato yellow leafcurl.Importantdiseasescausedbyviroids:Potatospindletuber,coconutcadang cadang

Unit5:Biofertilization,Phytostimulation,Bioinsecticides NoofHours:9

1. Plant growth promoting bacteria, biofertilizers – symbiotic (Bradyrhizobium,Rhizobium, Frankia), Non Symbiotic (Azospirillum, Azotobacter, Phosphatesolubilizers,algae)
2. Importanceofmycorrizalinoculum,typesofmycorrhizaeandassociatedplants,Massinoculumproductionof VAM,fieldapplicationsofEctomycorrhizaeandVAM.
3. General account of microbes used as bioinsecticides and their advantages oversynthetic pesticides, Bacillus thuringiensis- production and Field applications,Viruses– cultivation andfieldapplications.

SkillOutcomes:

1. Understand soil composition and characteristics, measuring water activity and pHlevels, interpreting soil profiles, and recognizing the influence of these factors onsoil fertility and plant growth.
2. Identifyingsoilmicroorganisms

3. Understand Rhizobium's characteristics demonstrate field application techniques,and recognize the importance of Rhizobium inoculation in enhancing plant growthandsoil fertility.
4. Demonstrate field application techniques, and recognize the role of Azotobacter inpromotingplant growth and soil nitrogen availability.
5. Identifycellulose-degradingmicroorganisms
6. Identifytheplant diseasesbasedon sectioncuttings

VSEMESTER

COURSE 15 A:FOOD ANDDAIRY MICROBIOLOGY

credits-3

CourseOutcomes: By the Completionofthe coursethelearner should ableto–

1. Understand the factors influencing microbial growth, contamination in foods, andsourcesof microbial contamination.
2. Gain knowledge of Microflora of milk, microbial contamination of raw milk andbutter,and spoilageof various food types.
3. Use dairy starter cultures in fermented dairy products, other fermented foods, andprobiotics.
4. DifferentiateFoodbornediseases,intoxications,andinfections
5. To adopt food sanitation, control measures, Follow HACCP; Carry out tests to detectpathogens infoods

Unit1:Microbes in Foodand Dairy **No. ofHours: 9**

1. Intrinsic and extrinsic factors that affect growth and survival of microbes in foods,naturalflora and sourceofcontamination of foodsin general.
2. Microflora associated with milk and milk products and their importance. Sources ofmicrobialcontaminationof raw milk and butter
3. Sources of microbial contamination and spoilage of vegetables, fruits, meat, eggs,bread,cannedFoods;

Unit2:Food Preservation **No. ofHours: 9**

1. Principles of food preservation: temperature, canning, drying, irradiation, microwaveprocessingandasepticpackaging,chemicalmethodsoffoodpreservation:salt, sugar,organicacids,SO2, citrates, benzoates,nitriteand nitrates etc.
2. Microbialandchemicalchangesin rawmilkduringchillingandrefrigeration.
3. Naturally occurring preservative systems in milk like LP system, Immunoglobulins,Lysozyme, Lactoferrin. Food grade Biopreservatives (GRAS), Bacteriocins of lacticacidbacteria;NisinandotherantimicrobialsproducedbyLacticAcidBacteria(LAB)

Unit3:Fermentedfoods **No. ofHours: 9**

1. Dairy starter cultures, fermented dairy products: yogurt, acidophilus milk, kumiss,kefir,dahi andcheese
2. Other fermented foods: dosa, sauerkraut, soy sauce and tempeh, Probiotics: Healthbenefits,types ofmicroorganisms used, probioticfoods availableinmarket.
3. Utilizationanddisposalof dairyby-products–whey.

Unit4:Foodbornediseases **No. ofHours: 9**

1. Food borne diseases (causative agents, foods involved, symptoms and preventivemeasures)
2. Foodintoxications:Staphylococcusaureus,Clostridiumbotulinumandmycotoxins;
3. Food infections: Bacillus cereus, Vibrio parahaemolyticus, Escherichia coli,Salmonellosis,
4. Shigellosis, Yersinia enterocolitica, Listeria monocytogenes and Campylobacterjejuni

Unit5:Food Sanitation **No. ofHours: 9**

1. Foodsanitationandcontrol;HACCP;NationalandInternationalmicrobiologicalstandard sfordairy products(BIS,ICMSF, CodexAlimentariusStandards.
2. Culturalandrapiddetectionmethodsoffoodbornepathogensandintroductiontopredictive microbiology.
3. Genetically modified foods,Nutraceuticals, Biosensors in food,Applicationsofmicrobialenzymesindairy industry[Protease,Lipases].

SkillOutcomes:

1. Mastering the MBRT method and standard plate count technique, interpreting MPNresults,assessingmilkqualitybasedonmicrobialload,andunderstandingthesignific anceof microbialanalysis inensuring milk safety.
2. Check the efficiency of pasteurization of milk include understanding the principle ofthe test, performing the enzymatic reaction, interpreting results, and assessing theeffectivenessof milk pasteurization inensuring food safety.
3. Mastering aseptic techniques, perform sample preparation and isolation techniques,identify potential pathogens and spoilage microorganisms, and understand the role ofmicroorganismsin food safety and spoilage.
4. Follow yogurt fermentation protocols, controlling fermentation conditions, assessingyogurtquality,and understandingtheroleofmicrobial culturesinyogurt production.

VSEMESTER

COURSE15 A:FOODANDDAIRYMICROBIOLOGY

credits-1

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1. MBRTofmilk samplesand theirstandard plate count.
2. Alkalinephosphatasetesttocheck theefficiencyofpasteurizationofmilk.
3. Isolation of any foodborne bacteria from food products. Isolation of spoilagemicroorganismsfrom spoiled vegetables/fruits.
4. Isolationofspoilagemicroorganismsfrombread. 5.PreparationofYogurt/Dahi.

References

1. Stanbury,PF.,PrinciplesofFermentationTechnology.Whittaker,AandHall,
2. S.J2ndEdition. PergamonPress(1995).
3. Banwart, GJ. Basic Food Microbiology. CBS Publishers and Distributors, Delhi.(1989).
4. Hobbs BC and Roberts D.Food poisoning and Food Hygiene. Edward Arnold (Adivisionof Hodder and Stoughton) London.
5. Joshi. Biotechnology: Food Fermentation Microbiology, Biochemistry andTechnology.Volume2.
6. JohnGarbult.EssentialsofFoodMicrobiology.ArnoldInternational.
7. JohnC.Ayres.J.OrwinMundt.WilliamE.Sandinee.Microbiologyof Foods.
8. W.H.FreemanandCo.
9. D. J. Bagyaraj and G. Rangaswami. AGRICULTURAL MICROBIOLOGY.PrenticeHall ofIndiaPvt Ltd.2005
10. NSSubbaRao.SoilMicrobiology.OxfordandIBHpublishingCompany2009
11. PhotisPapademas.DairyMicrobiology:APracticalApproach.CRCPress
12. RaoM.K..FoodandDairyMicrobiology. ManglamPublishers
13. WilliamFrazier.FoodMicrobiology.McGrawHillEducation
14. Jay,JamesM., Loessner,Martin J.,Golden,David A. ModernFood Microbiology.Springer.

Co-CurricularActivities:

1. FoodMicrobiologyWorkshops
2. Assign projects or lab exercises where students analyze food and dairy products formicrobialquality and safety.
3. Organizevisitstofood processingfacilitiesordairy
4. Seminars on Food Safety and Quality Assurance, food regulations, and qualitymanagementsystems.

VSEMESTER
COURSE14B:AGRICULTURAL MICROBIOLOGY

credits-1

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1. Studysoilprofile,wateractivity,pH
2. Studymicrofloraofdifferent typesofsoils
3. Rhizobiumassoilinoculant,characteristics andfieldapplication

4. Azotobacterassoilinoculant,characteristicsand fieldapplication
5. Isolationof cellulosedegradingorganisms
6. DemonstrationofKoch's postulatesinfungal,bacterialandviralplantpathogens.
7. Study of important diseases of crop plants by cutting sections of infected plantmaterial(microscopicobservations)- Albugo,Puccinia,Ustilago,Fusarium,Colletotrichum.

References:

1. AgriosGN.(2006).PlantPathology.5th edition.Academicpress, SanDiego,
2. .LucasJA.(1998).Plant Pathology and PlantPathogens.3rd edition.BlackwellScience,Oxford.
3. MehrotraRS.(1994).PlantPathology.TataMcGraw-HillLimited.
4. RangaswamiG.(2005).Diseases of Crop Plants India.4th edition.Prentice Hall IndiaPvt.Ltd.,NewDelhi.
5. SinghRS.(1998).PlantDiseasesManagement.7thedition.Oxford&IBH,NewDelhi.

Co-CurricularActivities:

1. Projectoncollectingphotographsof diseasedplantsandidentification
2. Project on collecting photographs of diseased plant parts and identificationofpathogen

3. Workshops/Lecturesonnaturalfarmingmethods

VSEMESTER
COURSE15 B:ENVIRONMENTALMICROBIOLOGY

credits-3

CourseOutcomes:

Bythecompletion ofthe coursethe learnershould ableto

1. Explore ecosystems (terrestrial, aquatic, atmospheric) and microflora in soil, water,atmosphere,human/animal bodies.
2. Learn about mutualism, synergism, commensalism, competition, parasitism,predation in microbes. Study plant-microbe and animal-microbe interactions.3.Understand microbial involvement in carbon, nitrogen, phosphorus, and sulfurcycles,including organicdegradationand nutrientprocesses.
3. Study solid waste disposal (composting, landfill), liquid waste treatment (sewage),andmicrobial bioremediation (pesticides,hydrocarbons, metals).
4. Applythemicroorganismsinbioremediationprocesses

Unit1:Microorganismsandtheir Habitats **No. ofHours: 9**

1. StructureandfunctionofecosystemsTerrestrialEnvironment:Soilprofileandsoil microflora, Decomposition ofplant organicmatter.
2. Aquatic Environment: Microflora of freshwater and marine habitats.Atmosphere:Aero microfloraand dispersalofmicrobes
3. Animal Environment: Microbes in/on human body (Microbiomics) & animal(ruminants) body.

Unit2:MicrobialInteractions **No. ofHours: 9**

1. Microbeinteractions:Mutualism,synergism,commensalism,competition,amensalism, parasitism, predation Microbe-Plant interaction: Symbiotic andnonsymbioticinteractions
2. Microbe-animal interaction: Microbes in ruminants, nematophagus fungi andsymbioticluminescent bacteria.
3. ExtremeHabitats:Extremophiles:Microbesthrivingathigh&lowtemperatures,pH,highhydrostatic&osmoticpressures,salinity,&lownutrientlevels.

Unit3:BiogeochemicalCycling **No. ofHours:9**

1. Carboncycle:Microbialdegradationofcellulose,hemicelluloses,ligninandchitin
2. Nitrogencycle:Nitrogenfixation,ammonification,nitrification,denitrificationand nitratereduction
3. Phosphoruscycle:Phosphateimmobilizationandsolubilisation.Sulphurcycle:Microbes involved in sulphurcycle.

Unit4:WasteManagement **No. ofHours: 9**

1. SolidWastemanagement:Sourcesandtypesofsolidwaste,Methodsofsolidwastedisposal (composting and sanitarylandfill)
2. Liquid waste management: Composition and strength of sewage (BOD andCOD), Primary, secondary (oxidation ponds, trickling filter, activated sludgeprocessand septictank) and tertiarysewagetreatment
3. Treatment and safety of drinking (potable) water, methods to detect potabilityof water samples: (a) standard qualitative procedure: presumptive test/MPNtest, confirmed and completed tests for faecal coliforms (b) Membrane filtertechniqueand (c) Presence/absencetests

Unit5:MicrobialBioremediation **No. ofHours:9**

1. Bioremediation: Principles and degradation of common pesticides, organic(hydrocarbons,oilspills)andinorganic(metals)matter,biosurfactants.
2. Bioleaching, mineral recovery, removal of heavy metals from aqueouseffluents.Biodegradable plastics.
3. Biogasproduction:Methaneandhydrogenproductionusingmicrobialculture.

SkillOutcomes:

1. Assess soil properties (pH, moisture content, water holding capacity, percolation,capillaryaction) and understandtheirimpact onplant growth andsoil fertility.
2. Isolate bacteria and fungi from soil samples, and comprehend the diverse microbialcommunitiespresent in soil ecosystems.
3. Master techniques to isolate bacteria and fungi associated with plant roots,understand their ecological roles, and appreciate the significance of plant-microbeinteractionsin nutrient cycling and plant health.
4. Use the MPN method to evaluate microbial populations in water samples, andunderstandthe importanceof waterquality monitoringfor publichealth.
5. Measure BOD and COD in wastewater, and comprehend their significance inassessingpollution levelsand wastewatertreatmentefficiency.

VSEMESTER
COURSE15 B:ENVIRONMENTALMICROBIOLOGY

Practical 02hr/week credits-1

1. Analysis of soil - pH, moisture content, water holding capacity, percolation,capillaryaction.
2. Isolationofmicrobes(bacteria&fungi) fromsoil.
3. Isolationofmicrobes(bacteria&fungi)fromrhizosphereandrhizoplane.
4. Assessmentofmicrobiologicalquality ofwaterby MPNmethod.
5. DeterminationofBODofwastewatersample.
6. DeterminationofCODofwastewatersample
7. Study the presence of microbial activity by detecting (qualitatively) enzymes(dehydrogenase,amylase, urease) insoil.
8. Isolationof Rhizobiumfrom rootnodules.
9. Isolationof Azotobacterfromsoil.
10. Designand functioning ofabiogasplant.

III. References

1. AtlasRMandBarthaR.(2000).MicrobialEcology:Fundamentals&Applications.4th edition.Benjamin/CummingsSciencePublishing, USA
2. MadiganMT,MartinkoJMandParkerJ.(2014).BrockBiologyofMicroorganisms. 14th edition. Pearson/ BenjaminCummings
3. MaierRM,PepperILandGerbaCP.(2009).EnvironmentalMicrobiology.2ndedition, AcademicPress
4. Okafor,N(2011).EnvironmentalMicrobiologyofAquatic&Wastesystems.1stedition, Springer, New York
5. Singh A, Kuhad, RC & Ward OP (2009). Advances in AppliedBioremediation. Volume 17,Springer-Verlag, BerlinHedeilberg

6. BartonLL&NorthupDE(2011).MicrobialEcology.1stedition,WileyBlackwell,USACampbellRE.(1983).MicrobialEcology.BlackwellScientificPublication, Oxford,England.
7. Coyne MS. (2001). Soil Microbiology: An Exploratory Approach. DelmarThomson Learning.
8. Lynch JM & Hobbie JE. (1988). Microorganisms in Action: Concepts &ApplicationinMicrobialEcology.BlackwellScientificPublication,U.K.
9. Martin A. (1977). An Introduction to Soil Microbiology. 2nd edition. JohnWiley& Sons Inc.NewYork & London.
10. StolpH.(1988).MicrobialEcology:OrganismsHabitatsActivities.CambridgeUniversity Press, Cambridge,England.
11. SubbaRaoNS.(1999).SoilMicrobiology.4thedition.Oxford&IBHPublishingCo. New Delhi.
12. WilleyJM,SherwoodLM,andWoolvertonCJ.(2013).Prescott'sMicrobiology.9th edition. McGrawHillHigherEducation.

IV. Co-CurricularActivities:

1. Projectworkonassessmentofdifferentsoiltypes
2. PrepareaModel ofBiogasplant
3. Prepare amodel ofsewagetreatmentplant

Document : 3 (5) B.A Syllabus-2023

ANDHRAPRADESHSTATECOUNCILOFHIGHEREDUCATION
(w.e.f.AcademicYear2023-24)
Programme:B.A.HonoursinPublicAdministration

Semester	NameoftheCourse	Hours	Credits
I	1. FundamentalsofSocialSciences	4	4
	2. Perspectiveson IndianSociety	4	4
II	3. IntroductiontoPublicAdministration	4	4
	4. IndianAdministration	4	4
III	5. TheoryofPublicAdministration	4	4
	6. IndianAdministrationEmergingIssues	4	4
	7. UrbanGovernance	**4**	**4**
	8. IndianConstitution	**4**	**4**
IV	9. PublicRelationsandCommunications Skills	**4**	**4**
	10. SocialWelfareAdministration	**4**	**4**
	11. HumanRights-ConceptsandPrinciples	4	4
V	12. PublicPolicy	4	4
	13. AdministrativeLaw	4	4
	14. OrganizationBehavior	4	4
	15. ManagementofPublicEnterprises	4	4
VI	Internship		
VII	7.1DevelopmentAdministration(OR) 7.1SocialWork AssessmentMethods	4	4
	7.2Theory andModels ofComparativePublicAdmin.(OR) 7.2PanchayatRajSysteminIndia	4	4
	7.3OfficeManagement (OR) 7.3PersonnelAdministration	4	4
	7.4BasicResearchWritingSkills(SkillCourse)(OR) 7.4PersonalityDevelopmentandCommunicationSkills	4	4
	7.5SecretarialPractice (OR) 7.5DataBaseAdministration(SkillCourse)	4	4
VIII	8.1LegislativeProcedureandPractice (OR) 8.1LegalLiteracy-RightsAwareness	4	4
	8.2StateAdministration (OR) 8.2LocalAdministration	4	4
	8.3E-Governance (OR) 8.3Internationallaw	4	4
	8.4(A) IntroductiontoComputers (OR) 8.4PublicSpeaking(SkillCourse)	4	4
	8.5LifeSkill(SkillCourse)(OR) 8.5Co-operativeTheoryandPractices	4	4

Paper –

1FundamentalsofSocialSciences

Learning objectives: The student will be able to understand the nature, variousapproaches,organsofthestate,socialperspectivesand applicationof ICT.

LearningOutcomes:Onsuccessfulcompletion of the coursethe studentwill beable to :

1. Learn aboutthenatureandimportanceofsocial science.
2. UnderstandtheEmergenceof CultureandHistory
3. Knowthepsychologicalaspectsofsocialbeahaviour
4. Comprehendthenatureof PolityandEconomy
5. Knowledgeonapplicationofcomputer technology

Unit–I–WhatisSocial Science?

1. DefinitionandScopeof SocialScience –DifferentSocialSciences
2. DistinctionbetweenNaturalScienceandSocialSciences
3. InterdisciplinaryNatureofSocialSciences
4. Methods and Approaches of Social

SciencesUnit-II:Understanding HistoryandSociety

1. DefiningHistory, ItsNatureandScope
2. History-AScienceoranArt
3. ImportanceofHistoryinthePresentSociety
4. Types of History and Chronology of Indian

HistoryUnit– III– SocietyandSocial Behaviour

1. Definition,NatureandScopeof Psychology
2. ImportanceofSocial Interaction
3. NeedofPsychologyfor presentSociety
4. Thought process and Social

BehaviorUnit– IV– PoliticalEconomy

1. UnderstandingPoliticalSystems
2. PoliticalSystems–OrgansofState
3. UnderstandingoverEconomics -MicroandMacro concepts
4. Economic Growth and Development - Various aspects of

developmentUnit-V– Essentials ofComputer

1. MilestonesofComputerEvolution-Computer–BlockDiagram,Generationsof Computers
2. Internet Basics – Internet History, Internet Service Providers – Types of Networks – IP– Domain Name Services– Applications
3. EthicalandSocialImplications–NetworkandSecurityconcepts– Informationassurancefundamentals
4. Cryptography–SymmetricandAsymmetric–malware–Firewalls–FraudTechniques– Privacyand Data Protection

ReferenceBooks

1. The social sciences: An Integrated Approach by James M. Henslin and Danniel F.Chambliss
2. TheWonderthatwasIndia–A.L.Bhasham

3. Introductionto Psychology–MorganandKing
4. PrinciplesofPoliticalScience–A.C.Kapoor
5. ContemporaryPoliticalTheory–J.C.Johari
6. M.L.Jhingan–Economic Development –Vikas,2012
7. MLSeth–MacroEconomics -Lakshminarayana Agarawal,2015
8. FundamentalsofComputersby V.RajaRaman
9. CyberSecurityEssentialsbyJamesGraham, RichardHoward,RyanOlson

Activities:

1. GroupProjectWork
2. PPTPresentation,ParticipationinWebinars
3. Fieldvisits
4. GroupDiscussion
5. SurveyandAnalysis
6. ChartsandPosterpresentation
7. Identifying the attributes of network (Topology, service provider, IP address andbandwidthofyourcollegenetwork)andpreparereportcoveringnetworkarchitecture.
8. Identifythetypesofmalwaresandrequiredfirewallstoprovidesecurity.
9. LatestFraudtechniques usedbyhackers.

Paper –

IIPerspectivesonIndianSociety

Learning objectives: The student is expected to demonstrate the significance of socialsciences through better understanding of various fields of social experience and wouldbeable to apply methodsand approaches to socialphenomena.

LearningOutcomes: Onsuccessful completionofthecoursethe studentwill beable to :

1. Learn aboutthesignificanceofhumanbehavior andsocialdynamics.
2. Remembersthe Indian Heritageand freedomstruggle
3. ComprehendthephilosophicalfoundationsofIndianConstitution
4. KnowledgeonIndian Economy

Unit– 1 – Man in Society

1. HumanNatureandReal-LifeEngagement
2. SocialGroupsandSocial Dynamics
3. IndividualismandCollectivism –EthicalConcerns
4. Human Life – Social Influence and Social

ImpactUnit-

II:IndianHeritageandFreedomStruggleinIndia

1. Cultural&Heritagesites ofTourisminIndia
2. IndianDance,Musicand Yoga
3. RiseofNationalismUnder British Rulein brief(1857-1947)
4. ContemporaryhistoryofIndia-
   integrationofPrincelyStates,abolitionofZamindari,formationof linguisticstates

Unit–3– IndianConstitution

1. PhilosophicalFoundationsof IndianConstitution
2. Elementsof IndianConstitution
3. StudyofRights in IndianConstitution
4. Directive principles to

StateUnit– 4. IndianEconomy

1. IndianEconomy- Features–Sectoralcontributioninincome
2. RoleofFinancialInstitutions-RBI-CommercialBanks
3. MonetaryandFiscalPoliciesforEconomicDevelopment
4. Economic Reforms - Liberalization - Privatization-

GlobalizationUnit– 5 -Impact on Society & Analytics

1. RoleofComputer, impactof Computers onhuman behavior, e-mail,
2. SocialNetworking-
   WhatsApp,Twitter,facebook,impactofSocialNetworksonhumanbehavior.
3. Simulating, Modeling, and Planning, Managing Data, Graphing, AnalyzingQuantitativeData,
4. ExpertSystemsandArtificialIntelligenceApplicationsintheSocialSciences

References

1. IntroductiontoPsychology–AtkinsonRC
2. Historyofthefreedommovement inIndia –Tarachand
3. IndiasinceIndependence–Bipinchandra
4. IntroductiontotheConstitutionofIndiaD.D.Basu
5. S.KMisra&V.K Puri – IndianEconomy, HimalayaPublishing House, 2015
6. GovernmentofIndia,EconomicSurvey(Annual), NewDelhi

7. InformationandCommunicationTechnologyby APCCE
8. Computer Applications in the Social Sciences by Edward E. Brent, Jr. and Ronald E.Anderson

Activities:

1. Assignment
2. PPTPresentation,ParticipationinWebinars
3. Fieldvisits
4. GroupDiscussion
5. SurveyandAnalysis
6. ChartsandPosterpresentation
7. Identify the peripherals connected to a system and label them as either Input orOutput or both.
8. Identify the Operating System loaded in your system and compare the features withotherexisting OperatingSystem.
9. Collectlatestcensusdata anddraw agraphindicatingthegrowthrate.
10. Predicting the risk of depression, substance dependency, drinking, obsessivecompulsivedisorders, and suicide using AI.

SEMESTER –II
3.INTRODUCTIONTOPUBLICADMINISTRATION

Learningoutcomes

1. Awarenessabouttheevolutionand growthofthediscipline ofPublicAdministration.
2. Learningofbasic principlesandapproaches of PublicAdministration.
3. Theoreticalclarityofbasicconceptsanddynamics(bothecologicalandothers)relatingtoPublicorganizations.

UNIT– I

Public Administration as a Discipline: Meaning, Nature, Scope, Dimensions andSignificance of the discipline and its relations with Political Science, Management, Law andEconomics. Public and Private Administration. Evolution of Public Administration,MinnowbrookConferences (I,II&III)

UNIT– II

Growth and Trends in Public Administration: New Public Administration (NPA), NewPublic Management (NPM), Globalization and Public Administration, Paradigm Shift fromGovernmentto Governance.

UNIT– III

Organization and its Principles: Organization: Meaning, Basis and Forms of Organizations.Principles of Organization: Hierarchy, Unity of Command, Span of Control, Coordination,Authority and Responsibility, Supervision and Control, Centralization, Decentralization andDelegation

UNIT-IV

Chief Executive: Chief Executive: Meaning, Types, Functions and Role; Line, Staff andAuxiliaryAgencies.

UNIT-V

Administrative Behaviour: Decision Making, Communication, Leadership-Types andFunctions.

RecommendedReadings:

Avasthi, A and Maheshwari, S R (2013) Public Administration. Lakshmi Narain Agarwal:Agra

Basu, Rumki (2008) Public Administration: Concepts and Theories. Sterling Publishers: NewDelhi

Bhagwan, Vishnoo; Bhushan, Vidhya and Mohla, Vandana (2010) Public Administration. S.Chand:Jalandhar

Bhambri, C. P. (2010) Public Administration Theory and Practice(21stEdition). EducationalPublishers:Meerut

Bhattacharaya, Mohit (2008) New Horizons of Public Administration. Jawahar Publishers andDistributors:New Delhi

Bhattacharya,Mohit(2000)PublicAdministration.WorldPress:Calcutta

Henry, Nicholas(2013). Public Administration and Public Affairs (13thEdition). Taylor andFrancis:New York

Denhardt, Janet V and Denhardt, Robert B (2015) The New Public Service: Serving, NotSteering(4th Edition). Routledge: New York

SuggestedCo-CurricularActivities

1) InvitedLectures

2) Casestudyanalysis.

3) DebatesonAdministration

4) Seminars,GroupDiscussions, Quiz,etc.

5) Assignments

6) AlumniInteractions

7) PeriodicalinteractionswithExecutivesandPeoplesRepresentatives

SEMESTER –II
4. INDIANADMINISTRATION

Learningoutcomes

1. Knowledgeaboutthe evolutionandgrowthof Indian Administration

2. FamiliaritywiththeconstitutionalframeworkonwhichIndianAdministrationisbased.

3. GraspingtheroleofUnionExecutive

4. Understandingthein-builtcontrolmechanismsoverconstitutionalbodiesinparticularandadministration in general

5. Delineatingtheconstitutionalprovisionsanddynamicsofunion-staterelationships

6. Awarenessabouttheinstitutionsandmechanism inforceforcitizen-stateinterface

UNIT– I

Evolution & Constitutional Framework: Evolution of Indian Administration duringAncient,MedievalandBritishperiod;ConstitutionalFrameworkofIndianAdministration;and Salient Features of Indian Administration

UNIT– II

UnionGovernment: President;PrimeMinister&CouncilofMinisters;Vice-President:CentralSecretariat

UNIT– III

StateGovernment: Governor,ChiefMinisterandCouncilofMinisters,StateSecretariat.

UNIT– IV

Constitutional Institutions, Union State Relations & Control over Administration: ElectionCommissionofIndia;UnionPublicServiceCommission;UnionStateRelations(Legislative,Executiveand Financial).

UNIT-V

CitizenandStateInterface: Citizens'GrievancesRedressalInstitutionsandMechanisms; Institutional Mechanism for Prevention of Corruption: Central VigilanceCommission;Lok Pal and Lok Ayukta;

RecommendedReadings:

1. Arora,RameshK.andGoyal,Rajni(1997)IndianPublicAdministration:InstitutionsandIssues. New Age International Publishers: New Delhi
2. Avasthi,AandAvasthi,AP(2004)IndianAdministration.LaksmiNarainAggarwal:Agra
3. Balfour,LadyBetty(2015)LordLytton'sIndianAdministration1876-1880TheUntoldHistory. Gyan Books: New Delhi
4. Basu,DD(2013)IntroductiontotheConstitutionofIndia(21stEdition).LexusNexus:New Delhi
5. Chakraborty,Bidyut(2016)IndianAdministration.Sage:NewDelhi
6. Fadia, B L and Fadia, Kuldeep (2017) Indian Administration, (New Edition).SahityaBhawan: Agra
7. Ghuman,BS;Monga,AnilandJohal,RamanjitKaur(Eds.)(2012)CorruptionandQuality of Governance: Experiences of Select Commonwealth Countries. AalekhPublishers:Jaipur
8. KangleRP(1972)The KautilyaArthshastra.MotilalBanarsidass:NewDelhi
9. Kapur,Devesh;Mehta,PratapBhanuandVaishnav,Milan(Eds.)(2017)RethinkingPublicInstitutionsin India.OxfordUniversityPress: NewDelhi
10. Maheshwari,SR(2000)Indian Administration.OrientLongman:NewDelhi
11. Palmer,ND(1961) IndianPoliticalSystem. GeorgeAllenandUnwin:London
12. Sarkar,JadunathSir(1972)MughalAdministration.M.C.Sarkar:Calcutta

13. Sharma,Ashok(2016)AdministrativeInstitutionsinIndia.RBSAPublishers:Jaipur
14. Sharma,M(2007)IndianAdministration.Anmol:NewDelhi
15. Sharma,PrabhuDattaandSharma,BM(2009)IndianAdministration:RetrospectandProspect. Rawat Publications: Jaipur
16. Singh, MandSingh,H (1989)Public Administrationin India. SterlingPublishers:NewDelhi.

SuggestedCo-CurricularActivities

1) InvitedLectures

2) Casestudyanalysis.

3) DebatesonStructureofoffices

4) Seminars,GroupDiscussions, Quiz,etc.

5) Assignments

6) AlumniInteractions

7) PeriodicalinteractionswithExecutives.

5.THEORIESOFPUBLICADMINISTRATION

Learningoutcomes

1. Understandingthetheoreticalbackgroundofpublicadministration.
2. Understanding the contributions of different social science thinkers to the theoryof publicadministration.
3. Learningthatpublicadministrationfunctioninanenvironment.

UNIT– I

Classical Approaches: Classical Approaches- Henry Fayol, Luther Gullick and LyndallUrwick

ScientificManagementApproach-F.W.Taylor.

UNIT– II

Bureaucratic Approach: Bureaucratic Approach – Max Weber and Karl MarxHumanRelations Approach: Elton Mayo.

UNIT– III

BehavioralApproach: BehaviouralApproach –H.ASimon

Socio-Psychological Approach: Hierarchy of Needs: Abram Maslow.TheoryXandTheory Y-DouglasMc Gregor.

UNIT– IV

Ecological Approach: Comparative Public AdministrationEcologicalApproach–F.W. Riggs

UNIT– V

SystemsApproach:SystemsApproach, DevelopmentAdministration.

RecommendedReadings:

PrabutvaPalanaSastram:Bhavanalu,Siddantalu,TeluguAcademy

D.Raveendra Prasad and Y.Parthasarathi (EDS) Public Administration concepts, theories andprinciples(English), Telugu Academy, Hyderabad (2011)

Avasthi, Amareswar and Maheswari, SriRam, Public Administration (30th) Edition, LakshmiNarayanaAgrawal, Agra. 2010.

RumkiBasu, Public Administration concepts and theories (5th revised) Publishers, New Delhi2004.

Nicholas, Henry, Public Administration and public affairs (10th) Edition, PHI, New Delhi2007.

SuggestedCo-CurricularActivities

1) InvitedLectures

2) Casestudyanalysis.

3) Debatesontopics

4) Seminars,GroupDiscussions, Quiz,etc.

5) Assignments

6) AlumniInteractions

6.INDIAN ADMINISTRATION – EMERGING ISSUES

Learningoutcomes

1. Learningtheinfluencesofvariousemergingissueson IndianAdministration
2. Understanding the issues confronted by Public Administration currently the means toaddressthem.
3. GainingknowledgeofvariousActsforweakersections andutilizingthemindaytolife.

UNIT–I

Citizen Grievances: Right to Information Act, (RTI),Nationaland StateHuman Rights Commission.

UNIT–II

Welfare Programmes: Administration of welfare Programmes of Weaker Section, SCs, STs,BCs-Women and Minorities, SC and STAtrocity Act.

UNIT–III

Emerging Issues: Mechanism for Disaster Management – Cyclones, Earth Quakes and Floods.GovernanceandE-GovernanceApplications inIndian Administration.

UNIT–IV

Public and Private Partnership: Public and Private Partnership and voluntary sector.PublicCorporations, Independent Regulatory Commission.

UNIT–V

Local Self Administration: Rural and Urban Structure and functions – 73rd and 74thConstitutional Amendment Acts – Revitalizations of Local Institutions -Issues andChallenges.

RecommendedReadings:

IndianGovernmentandPolitics,TeluguAcademy,Hyderabad,2007.

Avasthi and Avasthi, Indian Administration, (6th edition), Lakshminaraya Agrawal, Agra, 2010-2011.

DisasterManagementAct, 2005.

Siuli Sarkar, Public Administration in India, PHI, New Delhi, 2010.Reportsofthe theAdministraive Reforms Commission.

SuggestedCo-CurricularActivities

1) InvitedLectures

2) Casestudyanalysis.

3) Debatesontopics

4) Seminars,GroupDiscussions, Quiz,etc.

5) Assignments

6) AlumniInteractions

7) PeriodicalinteractionswithExecutives.

7.URBANGOVERNANCE

LearningOutcomes:

- Understandthevarious aspectsof urbangovernanceand the roleoflawand policytherein.
- .Haveabasic understandingof legal processesand documentsand how toread them.
- Appreciate the role played by socio-political processes in the implementation of law andpolicy.
- . Evaluate the functioning of laws, policies and institutions of urban governance from theperspectiveof democraticgovernanceand other constitutionalvalues.
- Understandtheneedfor reformsinurbangovernanceandthesteps takeninthisdirection

UNIT –I :Introduction to Urban Governance in India - Constitutional history of the 74thConstitutional Amendment - Overview of legislation on urban local bodies –Smart CitiesandAMRUT urban development.

. **UNIT II**: Institutions and processes -Types of urban local bodies Constitution of India:Article 243-Q - Composition of urban local bodies - Elections and reservation; Councillorsand wards Constitution of India: Articles 243-R, 243-T, 243-U - Mayor in Council -Standing Committee and other committees - Municipal Commissioner and other officers -Functions of urban local bodies -Devolution of functions from state governments to urbanlocalbodies ConstitutionofIndia: TheTwelfth Schedule

UNIT –III Finance -Overview of Municipal Finances - State Finance Commission - Functionaries: municipal auditors and accountants Constitution of India: Articles 243-I, 243-Y - Municipal Funds; Special Funds - Municipal budgeting and Introduction to municipaltaxation - Property tax; classification and assessment of buildings- Octroi; water, sanitationand other taxes Constitution of India: Articles 243-X, 265 and 15 th Finance Commissionrecommendationswith respect to the Urban localbodies.

UNIT–IVPlanningandRegulation

The importance of planning: “ideal” cities and the rule of law • Role of the law in regulatingdevelopment: formal and informal settlements Institutions and systems - City developmentauthorities and their functioning - Town & Country Planning Departments - Para-statals andtheir relationship with other agencies -Development Plans, Master Plans, DevelopmentControlRegulations-Violations of theplanned city

UNIT-VEnvironmentandurbangovernancerelationship

Sources of Indian Environmental Law Constitution of India: Articles 21, 48A, 51A B.Institutions - Ministry of Environment, Forests and Climate Change- Central and StatePollution Control Boards - National Green Tribunal C. Environmental governance and thecity - Polluter Pays; Sustainable development; Precautionary Principle. - Overview of UrbanWater,Sanitation and Hygiene(WASH)-Discussion ofCases

ReferenceBooks

1. PlanningCommission,Report oftheWorking grouponUrban Governance(2011)

2. Chetan Vaidya, Urban Issues, Reforms and Way Forward in India, Department of EconomicAffairs,Government ofIndia (2009

3. Ministry of Urban Development, JNNURM Reform Papers on: (i) e- governance (ii)PropertyTax (iii) Community Participation Law

4.K.C. Sivaramakrishnan, Governing Megacities: Fractured Thinking, Fragmented Setup,Introduction(Oxford University Press: 2014)

5. Anuj Bhuwania, Courting the People: Public Interest Litigation in Post-Emergency India(CambridgeUniversity Press: 2017)

6. PraveenDonthi,The RoadtoGurgaon, CaravanMagazine (January2014)

7. Reserve Bank of India, Municipal Finance in India: An Assessment, Chapter 3 (December2007)5. ParthaMukhopadhyay, Unsmart Cities, Livemint (June2016)

SuggestedCo-CurricularActivities

1) InvitedLectures

2) Casestudyanalysis.

3) Debatesoninteresting topics

4) Seminars,GroupDiscussions, Quiz,etc.

5) Assignments

6) AlumniInteractions

7) PeriodicalinteractionswithExecutivesandPeoplesRepresentatives

8. INDIANCONSTITUTION

LearningOutcomes:

Onsuccessfulcompletion ofthe coursethestudents willbeableto;

- Summarizetheevolutionandhistoricalimportanceoftheindian Constitutionfrom1858to 1947.
- Explainvariousstagesinthe compositionoftheIndianConstitution.
- Developawarenessabouttheirprimaryrightsandduties&buildup theircivicsense.
- Comprehendthedistributionofpowersbetweenthecenterandstates.
- Summarizeandsketchthespecificrolesofheadsof Nationandthefunctioningoflegi slativebodies.

UNIT-I

Historical Perspective of the Indian Constitution–A brief discussion of variousActsi.e.from1858to1947passedbytheBritish Government.

UNIT-II

Constitution of India: Preparation of Indian constitution by Constituent Assembly ofIndia, Preamble or Philosophy of the Indian Constitution, Salient features of theIndianconstitution.

UNIT-III

Fundamental Rights- the unimportance & Limitations, Fundamental Duties and theimportance, Directiveprinciplesof thestatepolicyandtheir implementation

UNIT-IV

Indian Federalism: Distribution of powers between Union and State Governments,Legislative,ExecutiveandFinancialrelationsbetweenUnionandState Governments

UNIT-V

ParliamentaryformofGovernmentinIndia

1. UnionExecutive

a) PresidentofIndia-Powersandfunctions

b) Vice-President-Powersandfunctions

c) PrimeMinisterandCouncilofMinister-Powersandfunctions

2. UnionLegislature

a) RajyaSabha–PowersandFunctions

b) LokSabha-PowersandFunctions

c) Amending Procedure-Important Constitutional Amendments–42nd, 44thConstitutionalAmendment Acts.

d) Judiciary–SupremecourtofIndia-PowersandFunctions

References

1. DDBasu-IntroductiontoftheConstitutionofIndia–18thEdition.Prentice –HallofIndiaPrivateLtd-NewDelhi-1998
2. GranvilleAustin(1972)theIndianConstitution,CornerstoneofaNation,Oxfo rduniversity Press,New Delhi
3. Madhavkhosla(2012) the Indian Constitution, Oxford University Press, NewDelhi

1.4. Granville Austin (1999) Working a Democratic Constitution; History of theIndianExperience, OxfordUniversity Press,New Delhi

4. Zoya Hasan, Sridharan EandSudharshanR(Eds)2002 India‟s livingConstitution,Permanentblack, New Delhi
5. BaxiUpendra(1980)theIndianSupremeCourtandPolitics,EasternBookCo,Lucnow.

SuggestedCo-CurricularActivities

1) InvitedLectures
2) casestudy analysis.
3) Debatesoninteresting topics
4) Seminars,GroupDiscussions, Quiz,etc.
5) Assignments
6) AlumniInteractions
7) PeriodicalinteractionswithPeoplesRepresentativesandExecutiveOfficials.
8) StudentPresentations.

9.PUBLICRELATIONSANDCOMMUNICATION SKILLS

LearningOutcomes:

Onsuccessfulcompletion ofthe coursethestudents willbeableto;

- Understandthehistoricalbackgroundandrole PublicRelationsinvariousareas
- Haveinsightintotheuseof thetechnologicaladvancementsinPublicRelations
- ComprehendtoolsofPublicRelationsinordertodeveloptherequired skills.
- Understandthe ethicalaspectsandfutureofPublicRelationsinIndia
- DevelopwritingskillsfornewspapersandcreationofBlogs.

UNIT-I

a) PublicRelations:Meaning,Definition,Nature andScope,HistoricalBackground

b) MinistryofInformationandBroadcasting-Organizations,Functions.

UNIT-II

a) ConceptsofPublicRelations-Press,Publicity, Lobbying,Propaganda,Advertising,SalesPromotionand CorporateMarketing Services,

b) Tools of Public Relations- PressConferences,Meets,PressReleases,Announcements, Webcasts

UNIT-III

a) PublicRelationsandMass Media,Presentand futureofPublic RelationsinIndia,

B) Theories of Mass Communication- Cognitive Theory, Authoritarian Theory,LibertarianTheory.

UNIT-IV

a) Employee andStakeHolderRelations.

b) EducationandCommunityRelations.

UNIT-V

A) EthicsofPublicRelationsandSocialResponsibility

B) PublicRelationsandWriting-PrintedLiterature,Newsletters,OpinionpapersandBlogs

References

1. Brown,Rob,PublicRelationsandtheSocialWeb,KoganPageIndia,NewDelhi,2010.
2. Cutlipscottetal,EffectivePublicRelations,London,1995.
3. BlackSam,PracticalPublicRelations,UniversalPublishers,1994.
4. S.M.Sardana,PublicRelations:TheoryandPractice.
5. J.V.Vilanilam,PublicRelationsinIndia:NewTasksandResponsibilities,SAGEPublicationsIndiaPvtLtd,New Delhi2011.
6. WebsitesonPublicrelations.

SuggestedCo-CurricularActivities

1) InvitedLectures

2) casestudy analysis.

3) Debatesoninteresting topics

4) Seminars,GroupDiscussions, Quiz,etc.

5) Assignments

6) AlumniInteractions

7) PeriodicalinteractionswithPublicRelationsStaff

8) StudentPresentations.

10.SOCIALWELFAREADMINISTRATION

LearningOutcomes:

Studentsat thesuccessful completionof the coursewill be able to;

- UnderstandthefundamentaldynamicsofSocialWelfareadministrationespeciallyfromthecontextofIndian system.
- Abilitytoanalyzeandelucidatevariouspoliciesbythegovernment of India.
- Criticalevaluatethesocialplanningsystemsandstructuresin India.
- UnderstandingthedynamicsofDevelopmentandSustainabledevelopmentindicesandprocedures.
- Criticalthinkingtowardsvariouswelfaremeasures&policiesdraftedtowardsdevelopmentalperspective.

UNIT-1

Definition,nature&scopeofsocialwelfare,Conceptsofsocialwelfare,socialadministrationinIndia,CSWB ,models of welfare-familial, institutional, Titmus.

Unit2:

INTRODUCTIONTOSOCIALPOLICY

Definition, meaning and nature of social policy, Objectives of social policy, types of social policy,National Women's policy, National children's policy and National youth policy, Tribal Policy, Policyforaged,Disability policy and Population policy

Unit3:

INTRODUCTIONTOSOCIALPLANNING

Meaning&definition,TypesofPlanning-Tactical,Operational&Strategic,Typesofplan-Fiveyearplan, annual plan, short term plans, and long term plans. NitiAayog, features, objectives, constitution,nitiaayogas astrategyfor new India,AtalInnovation Mission.

Unit4:

INTRODUCTIONTODEVELOPMENT,SOCIAL&SUSTAINABLEDEVELOPMENT:

Meaning&Definitions,natureofdevelopment,indicatorsofdevelopment,distinctionbetweendeveloped, developing and under developed nations, MDG and models of development – Capitalistic,Communistic,Socialistic&Mixed-Economy,GandhianapproachtodevelopmentorSarvodayamovement

Unit5:

CONSTITUTIONALFUNCTION&ROLESOFSOCIALMANAGERS:(15Hrs)Constitutionof India,fundamentalrights,DPSP,Currentbudgetreview.Roleofsocialmanagersinwelfareadministration,Policy formulation and development.

ReferenceBooks:

1. SocialWork&SocialWelfareAdministration:Methods&Practices,RameshwariDeviRaviPrakash,VolI&II1998,Mangal DeepPublications, Jaipur.
2. SocialWelfare,Edited byASKholi, 1997,AnmolPublications, NewDelhi.
3. SocialWelfare& SocialWork,JainendraKumarJha, 2002,AnmolPublications, NewDelhi.
4. NGO's&GovernmentalOrganisations-Role, Duties&Functions,NCDobriyalsumitenterprises.
5. SocialWelfareAdministrationinIndia,DrDRSachdeva,KitabMahalPublications.
6. NGO'sandSocialWelfare-NewResearchapproaches,DavidLewis&NRavichandra,RawatPublication.
7. SocialPolicy,John Baldock,NickManning &etal,Oxford UniversityPress.
8.SocialPolicy-Themes&Approaches,PaulSpicker,2ndedition,RawatPublication,Jaipur9.SocialPolicy& Social Work, AK Rizwi, Mohit Publication.
10. SocialPolicyb&SocialWork,DavidDenney,OxfordUniversityPress.

SuggestedCo-CurricularActivities

1) InvitedLectures
2) Casestudyanalysis.

3) Debatesoninteresting topics
4) Seminars,GroupDiscussions, Quiz,etc.
5) Assignments
6) AlumniInteractions
7) PeriodicalinteractionswithExecutivesandPeoplesRepresentatives

11. HUMANRIGHTS:CONCEPTS ANDPRINCIPLES

LearningOutcomes:

- Tofamiliarizethestudentsontheuniversaldeclarationofhumanrightsanditsimplications.
- TointroducethestudentsonNational,StateHumanRightscommissionandhumanrightscourts.

Unit-1:

IntroductiontoHumanRights

DefinitionofHumanRights—CharacteristicsofHumanRightsTheoriesofHumanRights— Theconcepts of Liberty,Equality and Justice.

Unit-2:

GlobalPerspective

UnitedNationandHumanRights-UnitedNationHumanRightsCommission-UniversalDeclarationofHuman Rights.

Unit-3:

HumanRightsinIndia-NationalHumanRightsCommission—StateHumanRightsCommission — HumanRights Courts.

Unit-4

ClassificationofRights-CivilRights-PoliticalRights—EconomicRights—SocialRights —CulturalRights.

Unit5:

VulnerableGroupsRightsChildrenRights —RightsofMinorities —Prisoners'Rights.

III. References

1. BasuD.D.,HumanRightsinConstitutionalLaw,1995.
2. SubramanianS.,HumanRightsTraining,NewDelhi:ManasPublications,1999.
3. SubramanianS., HumanRights: International Challenges, NewDelhi: Manas Publications,1999.
4. VijayK.Gupta(Ed.),PerspectivesonHumanRights,NewDelhi:VikasPublishingHousePvt. Ltd., 1996.
5. HumanRightsEducationforCitizenship,AmnestyInternational,1997.

SuggestedCo-CurricularActivities

1) InvitedLectures
2) Casestudyanalysis.
3) Debatesoninterestingtopics
4) Seminars,GroupDiscussions, Quiz,etc.
5) Assignments
6) AlumniInteractions
7) PeriodicalinteractionswithHumanRightsActivitistsandLawers.

12.PUBLIC POLICY

LearningOutcomes:

Onsuccessfulcompletion ofthe coursethestudents willbeableto;

- Understandingthebasicconceptssuchaspublicpolicy,policyanalysis,publicpolicypr ocess and governance
- KnowledgeofdifferentstagesofthePublicpolicyprocessintermsoftheoreticalformulat ionand the process
- NecessarycompetencetoundertakepolicyanalysisTeachingLearningmethods

UNIT-I

PublicPolicy:Concept,SignificanceandScope.

PolicyAnalysis:ConceptandSignificance andimplications

UNIT-II

PublicPolicyApproachesandModelswithspecialreferencetotheIncrementalismandRationalistPar adigms

UNIT-III

PolicyFormulationand Implementation.

RoleofPoliticalPartiesinPolicyFormulation

UNIT-IV

RoleofBureaucracy inPublicPolicyMaking.

Non-GovernmentalOrganizationsinPolicyMaking.

UNIT-V

Good-governanceandPublicPolicyMaking.

RoleofInformationTechnologyinPublicPolicyProcess.

References

1. Anderson,JE (2005)PublicPolicy Making(6th Edition).HoughtonMifflin: NewYork
2. Ayyar,VaidyanathanRV(2009)PublicPolicyMakinginIndia.Pearson:NewDelhi
3. Basu,DD(2011)ConstitutionofIndia(20thEdition).PrenticeHallof India:NewDelhi
4. Chakraborti,Rajesh(2017)PublicPolicyinIndia. OxfordUniversityPress:NewDelhi
5. Chakraborty,BidyutandChand,Parkash(2016)PublicPolicy:Concept,TheoryandPractice.Sage: New Delhi
6. Dolowitz, D P and Marsh, D (2000) Learning from Abroad: The Role of Policy Transfer inContemporaryPolicy-Making,Governance:AnInternationalJournalofPolicyandAdministration,13(1), Pp.5-24.
7. Dubhashi,P R(1986)PolicyandPerformance.Sage:NewDelhi
8. DyeThomas (2002) UnderstandingPublicPolicy. Pearson:Singapore/New Delhi
9. Ghuman, B S (1994) The Use of Input-Output Analysis in Regional Planning: A Case StudyofPunjab. Ajanta Publications: Delhi
10. Ghuman, B S (2014) Nehruvian Model of Development Planning: Rhetoric and Reality inGhuman, Ranjit Singh and Singh, Indervir (Eds.), Nehruvian Economic Philosophy and itsContemporaryRelevance.CentreforResearchinRuralandIndustrialDevelopment:Chandigar h.
11. Giuseppe,Marcon(2014)PublicValueTheoryinthecontextofPublicSectorModernizationin the book Public Value Management, Measurement and Reporting (Studies in Public andNon-ProfitGovernance),Vol.3, Guthrie,
12. SapruRKandY.Sapru,PublicPolicy:Formulation,ImplementationandEvaluation,SterlingPubli cationsPrivate Limited, 2020.
13. Laxmikanth,M(2011)GovernanceinIndia.Tata McGraw HillEducation:NewDelhi
14. Madan, K D (1982) Policy Making in Government. Publications Division, Government ofIndia:New Delhi
15. Radhakrishan Sapru, Public Policy: A Contemporary Perspective, Sage Publications IndiaPrivateLimited, New Delhi, 2017.

SuggestedCo-CurricularActivities

1) InvitedLectures
2) casestudy analysis.
3) Debatesoninteresting topics
4) Seminars,GroupDiscussions, Quiz,etc.
5) Assignments
6) AlumniInteractions
7) PeriodicalinteractionswithExecutivesandPeoplesRepresentatives.

13.ADMINISTRATIVELAW

LearningOutcomes:

Onsuccessfulcompletion ofthe coursethestudents willbeableto;

- Developinganunderstandingofprinciplesofnaturaljustice,ruleoflaw,administrativelegislation ,adjudication and much more
- Distinguishingbetweenconstitutionallaw,administrativelawanddroitadministrative
- Delineatingtheconcept,meritsanddemeritsofadministrativetribunalsandespeciallyCentralAd ministrativeTribunal
- Grasping the genesis,growthandconceptofombudsman, lokpalandlokayukta andcentralvigilancecommission

UNIT-I

Administrative Law: Definition, nature and scope of Administrative Law, Distinction betweenConstitutionalLaw and AdministrativeLaw andDroitAdministrative

UNIT-II

RuleofLaw;PrinciplesofNaturalJustice;AdministrativeTribunals,ReasonsfortheGrowthofAdmini strativeTribunals and its Structure.

UNIT-III

Delegated Legislation-concept,rationale, merits and demerits, Reasons for the growth ofdelegatedLegislation, Legislativeand Judicial Controlover delegatedlegislation.

UNIT-IV

Ombudsman: Institution of Ombudsman: concept and genesis; Central Vigilance Commission:structure,functions,roleandsignificance;andLokPalandLokAyuktainIndia- composition,powers, functions and significance.

UNIT-V

JudicialControlofadministrativeactionandremedies,OrdinaryRemedies,JudicialReview,Writs.

References

1. Chhabra,S(1990)AdministrativeTribunals.DeepandDeep:NewDelhi
2. Diwan,P(2007).Indian Constitution(2ndEdition).LawAgency:Allahabad
3. Kagzi,MC J(2008)IndianAdministrativeLaw(2ndEdition).Metropolitan:Delhi
4. Massey, IP(2008) AdministrativeLaw.EasternBook Company:NewDelhi
5. Mehta,SM(1990) IndianConstitutionalLaw.DeepandDeep:New Delhi
6. Sathe,SP (1998)AdministrativeLaw(6thEdition).Tripathi:Bombay
7. Sharma, S K (2007) Directive Principles and Fundamental Rights. Deep and Deep:NewDelhi
8. Swami, P M (1989) Swami's Manual of Disciplinary Proceedings for CentralGovernmentEmployees.Swami Publishers: Madra

SuggestedCo-CurricularActivities

1) InvitedLectures
2) casestudy analysis.
3) Debatesoninteresting topics
4) Seminars,GroupDiscussions, Quiz,etc.
5) Assignments
6) AlumniInteractions
7) PeriodicalinteractionswithJudicialStaffandExecutiveOfficials.
8) StudentPresentations.

14.ORGANISATIONAL BEHAVIOUR

LearningOutcomes:

Studentsat thesuccessful completion of thecoursewill beable to;

a. UnderstandPersonnelAdministration thatcanbeappliedtoacareer.
b. Acquire knowledge on recruitment, selection and training and identify jobcompetencies.
c. UnderstandtheimportanceandroleofcivilservicesinIndianGovernance.
d. Provideanoverviewonissuesin administration.
e. Enhanceskills, strategiesandtechniquesforredressal ofgrievances inadministration

UNIT-1

Introduction to Management – Principles of Management – Functions of management – Decisionmaking process - Social responsibility of Management – Fundamentals of Planning, Organising,Staffing,Leading, and Controlling.

UNIT-2

Introductionto OB -Learning – Personality Theories– Perception – Learning Process, andTheories– Values & Attitudes.

UNIT-3

Motivation Theories – Managing Motivation in Small and large organizations – EffectiveGroups & Teams – Leadership Theories, Styles – Group Dynamics – Power, Politics, andConflict– Resolving Conflicts.

UNIT-4

Organization Culture & Climate– Organizational Ethos – Functionality of Culture – Process andimplementation of Change – Managing Resistance to Change - Organization Structure andCommunication

UNIT-5

Organizational Development – Phases and Interventions of OD – Johari Window – TransactionalAnalysis-ManagerialInterpersonal Styles-Managing Stress &Burnout.

References:

1) FredLuthans:OrganizationBehaviour(McGrawHill)
2) StephenPRobbins:OrganizationBehaviour(Pearson)
3)RobinFinchanandPeterRhodes:OrganizationalBehaviour(Oxford)
4) J.PrakashReddy,Managementand:OrganizationalBehaviour(Himalaya)

SuggestedCo-CurricularActivities

1. Trainingofstudents byarelatedfieldexpertinPersonnelAdministration.
2. ReadingLocalDailynewspapereitherprintoronline.
3. ReadingEditorialpages,blogsandwebsitesforvariousideologicalperspectives.
4. Assignments.
5. Discuss the debates around any recent Ordinance, Bill or Act in the Parliament or StateLegislaturewith regard to servicematters of civilservants.
6. Planandorganizeacapacitybuildingsessionforthestakeholders
7. Seminars,Groupdiscussions, Quiz,Debatesetc.
8. Invitedlectures andpresentationsonrecentglobaltrendsinPersonnelAdministration.
9. MakevisittoaGovernmentofficeorreputedindustry,interactwithitsmembersandrecordtheirexperiencesonjobsatisfaction,promotions,motivationandinstitutionalarrangementsforgrievances.

15.MANAGEMENTOFPUBLICENTERPRISES

LearningOutcomes:

Studentsat thesuccessful completion of thecoursewill beable to;

a. UnderstandPersonnelAdministration thatcanbeappliedtoacareer.
b. Acquireknowledge onrecruitment,selectionandtrainingandidentify jobcompetencies.
c. Understandtheimportanceandroleofcivilservicesin IndianGovernance.
d. Provideanoverviewonissuesin administration.
e. Enhanceskills, strategiesandtechniquesforredressal ofgrievances inadministration

UNIT-1

Introduction: Meaning and Definitions of PSE's ; Features of PSE's ; Importance, advantagesand limitations of PSE's; Historical background and Current state of PSE's in India ;Forms ofPSE's; Contribution ofPSE'sin GDP.

UNIT-2

GoverningBodies: Meritsandmeritsoffunctionalpolicybodies;Lineandstafffunctions;Thecomposition,size and tenureof governing board.

Unit-3

Financial administration: Pattern of the share holdings and borrowings, Investment policy.Pricingpolicies, dividend decisions,budgeting, purchasesand sales policies.

Unit-4

PublicAccountability: Parliamentary,Perennialadministrablecontrol,Governmentdirectivesandinformal contacts; Autonomy of publicenterprises.

Unit-5

Personnel Administration: Workers participation in the administration of public enterprises;Labourrelations,Tradeunionismandcollectivebargaining;Provisionofamenitiesandadministrationofwelfarefund;Problems of recruiting,training and promotion.

References:

1) Ramanadhan V.V:StrectureofPublic EnterprisesinIndia.

2) KheraS.S:Government inBusiness.

3) Laxminarain:PublicEnterprisesin India.

4) RobsonW.A:NationalIndustry andPublicOwnership.

SuggestedCo-CurricularActivities

1. Trainingofstudents byarelatedfieldexpertinPersonnelAdministration.
2. ReadingLocalDailynewspapereitherprintoronline.
3. ReadingEditorialpages,blogsandwebsitesforvariousideologicalperspectives.
4. Assignments.
5. Discuss the debates around any recent Ordinance, Bill or Act in the Parliament or StateLegislaturewith regard to servicematters of civilservants.
6. Planandorganizeacapacitybuildingsessionforthestakeholders
7. Seminars,Groupdiscussions, Quiz,Debatesetc.
8. Invitedlectures andpresentationsonrecentglobaltrendsinPersonnelAdministration.
9. MakevisittoaGovernmentofficeorreputedindustry,interactwithitsmembersandrecordtheirexperiencesonjobsatisfaction,promotions,motivationandinstitutionalarrangementsforgrievances.

7.1DEVEOPMENTADMINISTRATION

LearningOutcomes:

Studentsat thesuccessful completion of thecoursewill beable to;

- UnderstandPersonnelAdministration thatcanbeappliedtoacareer.
- Acquireknowledgeon recruitment, selection andtraining and identify job competencies.
- Understandtheimportanceandroleofcivilservicesin IndianGovernance.
- Provideanoverviewonissuesin administration.
- Enhanceskills, strategiesandtechniquesforredressalofgrievances inadministration

Unit-1

DevelopmentAdministration:ConceptualAnalysis,ScopeandSignificanceofDevelopmentAdministration,Growthof Development Administration.

Unit-2

Development Strategy an d Planning: Mixed Economy Model: Goals of Development, NationalPlanning,StatePlanning,District Planning.

Unit-3

DecentralizationandDevelopment: ConceptofDecentralization, DecentralizedPlanning, RoleofVoluntaryAgencies, Cooperatives andSpecialized DevelopmentAgencies

Unit-4

CitizensParticipationinDevelopment,People'sEmpowerment,WomenEmpowerment,WelfareAdministrationof Scheduled Caste, Scheduled Tribes

Unit-5

BureaucracyandDevelopment:ChangingRoleoftheDistrictCollector,RoleofBlockDevelopmentOfficer, OtherDevelopment Officials atDistrict and BlockLevel.

References:

1. Katz,SaulM.,"ASystemsApproachtoDevelopmentAdministration",inRiggs,1970,
2. Esman, Milton, "The Politics of Development Administration" in John Montgomery andWilliamSiffin,eds.,ApproachestoDevelopment:Politics,AdministrationandChange,McGraw-Hill,New York, 1966.
3. Swerdlow(ed),DevelopmentAdministration:ConceptsandProblems,Syracuse,UniversityPress,1963)
4. BraibantiRalph,(ed):PoliticalandAdministrativeDevelopment,Durham,N.C.,DukeUniversity Press,1969
5. SapruR.K:Development Administration,SterlingPublication,N.Delhi,2002,p.83
6. ChaterjeeS.K.:DevelopmentAdministration:withspecialreferencetoIndia,SurjeetPublications,1996.

SuggestedCo-CurricularActivities

1. Trainingofstudents byarelatedfieldexpertinPersonnelAdministration.
2. ReadingLocalDailynewspapereitherprintoronline.
3. ReadingEditorialpages,blogsandwebsitesforvariousideologicalperspectives.
4. Assignments.
5. Discuss the debates around any recent Ordinance, Bill or Act in the Parliament or StateLegislaturewith regard to servicematters of civilservants.
6. Planandorganizeacapacitybuildingsessionforthestakeholders
7. Seminars,Groupdiscussions, Quiz,Debatesetc.
8. Invitedlectures andpresentationsonrecentglobaltrendsinPersonnelAdministration.
9. MakevisittoaGovernmentofficeorreputedindustry,interactwithitsmembersandrecordtheirexperiencesonjobsatisfaction,promotions,motivationandinstitutionalarrangementsforgrievances.

SOCIALWORKASSESSMENTMETHODS

LearningOutcomes:

Studentsat thesuccessful completion of thecoursewill beable to;

- UnderstandPersonnelAdministration thatcanbeappliedtoacareer.
- Acquireknowledgeon recruitment, selection and training and identify jobcompetencies.
- UnderstandtheimportanceandroleofcivilservicesinIndianGovernance.
- Provideanoverviewonissuesin administration.
- Enhanceskills, strategiesandtechniquesforredressal ofgrievances inadministration

Unit-1:

Case work: Concept, objectives and principles, Phases of case work process. Case work toolsand techniques: Home visit, Resource mobilization, Referral Service, Case work relationship.**Unit-2:**

Social group work: Definition, Philosophy and objectives, Principles of Group work method,Groupprocess, Leadership:Styles and Functions.

Unit-3:

Socialgroupworkpracticeinvariousfields: Objectives,programmemedia,worker'srole,Familyservice agency, Youth services.

Unit-4:

Community organization: Concept,principlesandthe process,Typesof leadersandtheirrolein community organization, recording in community Organisation, Role of community worker.**Unit-5:**

Social work research: Meaning and scope differences between social work research and socialresearch,stagesofsocialworkresearch.Sampling-definition,typesofsampling,advantagesanddisadvantagesofsampling,toolsofdatacollection,questionnaire,interviewschedule,observationetc; dataanalysis and report writing.

References:

1)Perlman,H.H.-SocialCaseWork- Aproblemsolvingprocess.
2. Friedlander,W.A.-Conceptsand Methodsof SocialWork
3. Ross Murray, G. - Community Organisation.4)Arthur,H.,CommunityOrganizationand dPlanning.

SuggestedCo-CurricularActivities

1. Trainingofstudents byarelatedfieldexpertinPersonnelAdministration.
2. ReadingLocalDailynewspapereitherprintoronline.
3. ReadingEditorialpages,blogsandwebsitesforvariousideologicalperspectives.
4. Assignments.
5. Discuss the debates around any recent Ordinance, Bill or Act in the Parliament or StateLegislaturewith regard to servicematters of civilservants.
6. Planandorganizeacapacitybuildingsessionforthestakeholders
7. Seminars,Groupdiscussions,Quiz,Debatesetc.
8. InvitedlecturesandpresentationsonrecentglobaltrendsinPersonnelAdministration.
9. Make visit to a Government office or reputed industry, interact with its members andrecord their experiences on job satisfaction, promotions, motivation and institutionalarrangementsforgrievances.

THEORYANDMODELSOFCOMPRAIVEPUBLICADMINISTRATION

I. LearningOutcomes:

Studentsat thesuccessful completionof the coursewill beable to;

- Highlight the factors that led to the evolution of comparative public administration Ability toanalyzeand elucidatevarious policiesby thegovernment ofIndia.
- Explainthemeaningofcomparativepublicadministrationinthecontextofitsgoalsandobjectives.
- Discussthenatureofcomparativepublicadministrationintermsofimportanttrendsinitsstudy;
- Analysethescopeofcomparativepublicadministrationinrelationtoitsvariegatedstudiesandtheir content; and
- Explaintheintellectualaswellasappliedsignificanceofcomparativepublicadministration.

Unit-I ComparativeMethodasanapproachtothestudyofPublicAdministration,TheConcept,Nature, Scope and Significance of comparative Public Administration, Approaches to the StudyofComparativePublicAdministration.

Unit-II TheoriesandModelsofComparativePublicAdministration:interpretationofFredRiggsandFerrel Heady.

Unit-III ComparativeStudyofGovernmentalSystemsinUK,USA,France;Executive,LegislativeandJudiciary.ComparativestudyofvariousControlMechanismsofAdministrationinUK, USAand France,Control Mechanismsover Administrationin U.K.& U.S.A.

Unit- IV Citizens & Administration: A comparative study of various mechanisms for Redessalof citizens' grievances in U.K., U.S.A &France , Emerging Trends in Comparative PublicAdministration. International systems: IMF, IBRD, WTO, World Bank. International Agencies:UNESCO,UNICEF,ILO, WHO.

UNITVTYPESOFCIVILSERVICEANDLOCALGOVERNMENTS:ComparativeStudy of Civil Services in UK, USA and France Comparative Study of Local Government InstitutionsinUK, USA and France

ReferenceBooks

1. S.SPahlya,RavindraSingh,NewDelhi,SterlingPublishersPvt,Ltd,NewDelhi,2012
2. RathodP.B.ComparativePublicAdministration,AbdPublishersJaipur-2007
3. JudithaBaraAndMarkPennigtonComparativePolitics,SagePublicationNewDelhi,2009.
4. Chatorvedi.T.N.ComparativePublicAdministrationAssociatedPublishingHouse,NewDelhi2002.
5. Arora,RameshK.2021.ComparativePublicAdministration:AnEcologicalPerspective.NewDelhi: NewAgeInternational
6. .Heady,Ferrel.1995.PublicAdministration:AComparativePerspective.NewYork:MarcelDekker.
7. Henry,Nicholas.2004.PublicAdministrationandPublicAffairs.UpperSadleRiver,N.J.:Pearson.
8. Sahni, Pradeep and E. Vayunandan. 2009. Administrative Theory. New Delhi: Prentice-Hall9.Waldo, Dwight. 1955. The Study of Public Administration. New York: Double day

SuggestedCo-CurricularActivities

1) InvitedLectures
2) Casestudyanalysis.
3) Debatesoninteresting topics

4) Seminars,GroupDiscussions, Quiz,etc.

5) Assignments

6) AlumniInteractions

7) PeriodicalinteractionswithExecutivesandPeoplesRepresentatives

PANCHAYATIRAJSYSTEMIN INDIA

LearningOutcomes:

- Studentswilllearnthesalientfeaturesofthe73rd AmendmentAct
- StudentswilllearntheworkingofPanchayatRajsystemindifferentpartsof India

Unit—I:Introduction

Gandhian Vision of Gram Swaraj - Panchayati Raj in Constitutional Assembly DebatesPanchayati Raj in Directive Principles — Local government in Ancient India — Localgovernmentduring theBritish period — Local Government after1947.

Unit — II: Evolution of Panchayati Raj System and Democratic Decentralization inIndia

Community Development Programme - BalwantRai Mehta Committee Report andImplementation of the Three Tier System - Ashok Mehta Committee Report — L.M.SingviCommitteeReport.

Unit—III:Constitutionalization ofPanchayatiRaj

73rd Constitutional Amendment Act 1992 (salient features) - Powers and functions ofPanchayatiRajInstitutions-PanchayatiRajinScheduledAreas—PESAAct,1996 —ScheduledAreas-6thSchedule —5th Schedule-EleventhSchedule.

Unit—IV:PanchayatiRajSystem in AndhraPradesh

Panchayati Raj System in Andhra Pradesh - Structure, Powers and Function - CriticalAppraisal

Unit—V:ComparativePanchayati Raj System

Comparative Panchayati Raj System - Kerala -West Bengal - Karnataka — Criticalappraisalof theworkingof Panchayati Raj Systemin India

References

1. Palanithurai,G.(ed.)DynamicsofNewPanchayatiRajSystemsinIndiaVol.I&II,NewDelhi:Concept Publishing House, 2002.
2. Palanithurai,G.,NewPanchayatiRajinTamilNadu(withtheActinoriginal)NewDelhi:Concept Pub.,2003
3. Sanyal,B.M.India:decentralizedplanning, themesandissues,Concept,NewDelhi,2001.
4. Pattnayak,Raimann(ed.)LocalGovernmentAdministrationReform, NewDelhi:AnmolPublications,2002.
5. Verma,B.M.Social Justiceand PanchayatiRaj,New Delhi:MittalPublications, 2002.
6. D.Bandyopadhyay(ed.).NewIssuesinPanchayatiRaj.NewDelhi:ConceptPublishingCompany, 2004.
7. P.S.K.Menon(ed.).PanchayatiRajinScheduledAreas:ACriticalStudy.NewDelhi:ConceptPublishingCompany, 2003.
8. R.P.Joshi.ConstitutionalizationofPanchayatiRaj:AReassessment.NewDelhi:RawatPublications ,1998.

.**SuggestedCo-CurricularActivities**

1) InvitedLectures
2) Casestudyanalysis.
3) Debatesoninteresting topics
4) Seminars,GroupDiscussions, Quiz,etc.
5) Assignments
6) AlumniInteractions
7) PeriodicalinteractionswithExecutivesandPeoplesRepresentatives.

OFFICEMANAGEMENT

LearningOutcomes:

Students at thesuccessful completion of thecoursewill beable to;

1. Understand fundamental knowledge of Office Management that can be applied to acareer.
2. Haveknowledgeonofficeadministrationand identifyjobcompetencies.
3. Understandtheimportanceofrecordmanagementandalliedsections.
4. Comprehendtheadministrativeprocessinoffice
5. IdentifythechallengesinthebackgroundofICT.
6. Enhanceskills,strategiesandtechniquestocompetewiththeglobalcompetenciesinoffi cemanagement.

Unit:1

Introduction to Office,Office structure-OfficeManagement: Meaning,Nature,Importance,ElementsandFunctions ofOfficeManagement-Basic Principlesofofficemanagement.

Unit:2

Office organization: Definition, Characteristics-Office Planning, Accommodation, Layout andOfficeEnvironment.

Unit:3

OfficeRecordManagement-ObjectivesandImportance-FilingSystem:Stepsinfiling,Essentialsforfiling,Classificationandarrangementsoffiles,Modernfilin gmethodsusingInformationandCommunication Technology and devices-Indexing: Essentials of a good indexing and Recordsretentionand Microfiling.

Unit:4

Office Communication: Meaning and mailing, Barriers to communication -Correspondence andReportWriting-Types-Periodical reports.

Unit:5

FormLetters:Meaning,Principles,Factorsindesigningofficeforms-SupervisorySkills-Importance of Motivation and Leadership-Issues in Office Management-Recent trends: e-office,useof modernappliancesandapplication ofITinofficemanagement.

References:

1. R.S.N.Pillai&Bagavathi,OfficeManagement,S.ChandPublishers,NewDelhi,2014.
2. R.K.Chopra,OfficeManagement,HimalayaPublishingHouse,NewDelhi,2016.
3. B.N.Tandon, Manual of Office Management and Correspondence, S.Chand Publications,NewDelhi, 2014.
4. Sudhir Andrews, Front Office Management and Operations, Tata McGraw Hill PublishingCo.Ltd,India,New Delhi, 2008.
5. BalachandranV,OfficeManagement,TataMcGrawHillPublishingCo.Ltd,India,NewDelhi, 2009.
6. BhatiaR.C,PrinciplesofOfficeManagement,Lotus Press,NewDelhi,2005.
7. Sharma,R.K&Others,OfficeManagement,KalyaniPublishers,NewDelhi,1991.
8. Chopra,R.K,ModernOfficeandItsManagement,HimalayaPublishingHouse,Hyde rabad,2008.
9. NirajKumar,ModernOfficeManagement,NewRoyal BookCo,Lucknow,2013.
10. Gopal Krishnan and Sundaresan, M, Material Management: An Integrated Approach,PrenticeHall ofIndia, New Delhi, 2014.

11. Satyasnarayana,J,E-Government,PrenticeHallofIndia,NewDelhi, 2015.
12. Kooiman, J (ed), Modern Governance: New Government-Society Interactions, SagePublications, London, 2014.
13. Bhatnagar, S.C, E-Government: From Vision to Implementation, Sage Publications, NewDelhi,2014.
14. Singhal. A and Evertt, Rogers, India's Information Revolution, Sage Publications, NewYork,1990.
15. SrinivasVallabhan,S.V,ComputerApplicationinBusiness,Sultan Chand&Sons,NewDelhi,2014.
16. Web resources suggested by the Teacher concerned and the College Librarian includingreadingmaterial.

SuggestedCo-CurricularActivities

1. Trainingofstudents bya relatedfield expertinOfficeManagement.
2. ReadingLocalDailynewspapereitherprintoronline.
3. ReadingEditorialpages,blogsandwebsitesforvariousideologicalperspectives.
4. Assignments.
5. Discussthedebatesaroundanyrecenttrends,technologicaladvancementsandinventionofnew appliancesthat aretobeused in modern officer management.
6. Planandorganizeacapacitybuildingsessionforthestakeholders.
7. Seminars,Groupdiscussions, Quiz,Debatesetc.
8. Invitedlectures andpresentationson recentglobaltrendsinofficemanagement.
9. MakevisittoaGovernmentofficeorreputedindustryorprivatefirminteractwithitsmembersand record their experiences and gain Hands on Experience of records maintenance, indexingandfiling procedures.

PERSONNELADMINISTRATION

LearningOutcomes:

Studentsat thesuccessful completion of thecoursewill beable to;

1. UnderstandPersonnelAdministration thatcanbeappliedtoacareer.
2. Acquireknowledgeonrecruitment,selectionandtrainingandidentifyjobcompetencies.
3. Understandtheimportanceandroleofcivilservicesin IndianGovernance.
4. Provideanoverviewonissuesin administration.
5. Enhanceskills, strategiesandtechniquesforredressalofgrievances inadministration

Unit:1

PersonnelAdministration:Concept,Nature,ScopeandSignificance-HierarchyinPersonnelAdministration-RolesandResponsibilitiesofPersonnelAdministrativeOfficers-Bureaucracy:Meaning,Characteristics,Nature,Importance anditsroleinmodernstate.

Unit:2

Recruitment: Meaning and Importance, Types of Recruitment, Methods of recruitmentwithregard to All India, Central and State Services-Union Public Service Commission and StatePublicServiceCommissions-ConstitutionalprovisionsandComposition,FunctionsandRole.

Unit:3

Training:Meaning,Objectives,TypesandSignificance-TrainingInstitutionsinIndia-Promotion-Promotion procedure-Career Planning, Evaluation and Development-Motivation and Morale-PerformanceAppraisal.

Unit:4

AdministrativeEthics-Integrityinadministration-CodeofConduct-CommonLapsesandDisciplinaryProcedure-Employeeand EmployerRelations-Rights ofCivilServants.

Unit:5

Problems in Personnel Administration-Employees participation in administration-Grievances-Institutional arrangements for settlement of disputes-Change in work place, Counseling andTimeManagement.

References:

1. AvasthiMaheswari,PublicAdministration,LakshminarayanAgarwal,Agra,2008.
2. Goel,S.L,PersonnelAdministration,DeepandDeepPublications,NewDelhi,2009.
3. Sharma,M.P,PublicAdministrationTheoryandPractice,KitabMahal,Allahabad,2005.
4. TripathiP.C,HumanResourceDevelopment,S.ChandPublications, NewDelhi,2016.
6. DavidE.Kalaignar,Public PersonnelManagement,IPMA,PrenticeHallInc, EaglewoodChiffs,NewJersy, 1986.
7. C.M.Jain,PublicPersonnelAdministration, CollegeBookDepot, Jaipur,2003
8. K.Aswarthappa,HumanResourceManagement:TextandCases,TataMcGrawHill,NewDelhi,2008
9. V.S.P.Rao,HumanResourceManagement,ExcelBooks,NewDelhi,2007
10. O.GlennStanl,PublicPersonnelAdministration,OxfordIBHPublicationCo,NewDelhi,2008.

11. Chatterjee.Bhaskar,HumanResourceManagement,SterlingPublications,NewDelhi,2009.
12. AdministrativeReformsCommission,1969,ReportonPersonnelAdministration.
13. GovernmentofIndia,SecondARC,TenthReportonRefurbishingofPersonnelAdministration.
14. Jain,R.B,AspectsofPersonnelAdministration,IIPA,NewDelhi,2008.
15. MaheswariSriram,PublicAdministrationinIndia:TheHigherCivilService,OxfordUniversityPress, New Delhi,2007.
16. Naff,KatherineC,NormaM,Riccucci,PersonnelManagementinGovernment,Politics and Process, Tayolr& Francis, New York,2014.
17. Tead,Ordway,PersonnelAdministration,UniversityofCaliforniaLibraries.
18. PundrikOjha&KiranSharma,PersonnelAdministration, RajPublishers,Agra,2018.
19. WebresourcessuggestedbytheTeacherconcernedandtheCollege Librarianincludingreadingmaterial.

SuggestedCo-CurricularActivities

1. Trainingofstudents byarelatedfieldexpertinPersonnelAdministration.
2. ReadingLocal Dailynewspapereitherprintoronline.
3. ReadingEditorialpages,blogsandwebsitesforvariousideologicalperspectives.
4. Assignments.
5. DiscussthedebatesaroundanyrecentOrdinance,BillorActintheParliamentorStateLegislaturewith regard to service mattersof civilservants.
6. Planandorganizeacapacitybuildingsessionforthestakeholders
7. Seminars,Groupdiscussions,Quiz,Debatesetc.
8. InvitedlecturesandpresentationsonrecentglobaltrendsinPersonnelAdministration.
9. MakevisittoaGovernmentofficeorreputedindustry,interact withitsmembersandrecordtheir experiences on job satisfaction, promotions, motivation and institutionalarrangementsforgrie

BASIC RESEARCH WRITING SKILLS(SKILLCOURSE)

LEARNINGOUTCOMES:

Studentsatthesuccessfulcompletion ofthecoursewill beable to

- Describewhyresearchisimportant.
- Describescientificmethods.
- Describeresearchreport.
- Describelibraryuse.
- Demonstratedictionaryusage.
- Demonstratethesaurususage.
- Demonstrateencyclopedias,almanacs,andatlasesusage.
- Demonstrateinternetsearchenginesusageforresearch.
- IdentifyInternetnewssources.
- Identifyinternetmagazines,blogs,andimages.
- Identifyjournals,papers, andmore.
- Summarizebibliographiesandtheirusageinresearch.

UNIT-I:

IntroductiontoResearch

Conceptofresearch–Importanceofresearch–Typesofresearch–Variousmethodsofresearch-Scientificmethods of research

UNITII:

Writingskills

Basicconceptsofwriting-introductiontowriting-reports-importanceofreports-typesofreports.

UNITIII:

ContentsofReport

PlanningofReportWriting-FormatofResearchReport

UNITIV:

PrinciplesofWriting

Principlesofwriting-Bibliography-DocumentationofBibliography

UNITV:

EvaluationofReport

TypingtheReport-Evaluating theResearchreport

REFERENCEBOOKS:

1. Ballou,Stephen.V,*AModelforThesesandResearchPapers*,Boston:HoughtonMifflibn,1970.
2. Barzun,JacquesandHenryF.Graff,*TheModernResearcher*,NewYork:Harcourt,Brace&World, 1970.
3. Berenson,ConradandRaymodColton,*ResearchandReportWritingforBusinessandEconomics,*New York:Random House, 1971 chapters8 to 17.
4. Bernstein,Theodore,*TheCarefulWriter:AModernGuidetoEnglishUsage,*NewYork:Athenеum,1965.
5. Bowers,Fredson,*PrinciplesofBibliographicalDescription*,NewYork:Russell&Russell, 1949.
6. Campbell, William GiIes and Stephen Vaughan Ballou*Formand Style: Theses,Reports,* TermPapers. inCo. 1974.
7. Corbett,EdwardP.J.,*ClassicalRhetoricfortheModernStudent,*NewYork:OxfordUniversity Press, 1971.
8. Dawe,Jessamon,*WritingBusinessandEconomicsTermPapers,ThesesandDissertations,* Totowa, NJ.: Littefield Adams andCo., 1965.

9. Flower,H.W.*ADictionaryofModernEnglishUsage,*NewYork:OxfordUniversityPress,1965
.
10. Gallagher, William J,,*ReportWriting for Management,*Reading,Mass:
AddisonWesleyPublishing Co., 1969.
11. Jonis.J.Harold,*TheBusinessResearchPaper,*NewYork:Hobbs Dorman &Co.,1967.
12. Kapp,R.O., *ThePresentationof Technical Information*,London: Constable, 1948.
13. Strunk,William,Jr.,andE.b.White,*TheElementsofStyle*,NewYork:Macmillanm,1972.
14. Jurabian,KateL.,*AManualforWritersofTermPapers,ThesesandDissertations,*
Chicago:UniversityofChicagoPress,1971.
15. UniversityofChicago,*A Manualof Style*,Chicago:University ofChicago,1969.
16. Zeisel,Hans,*Sayit*

SuggestedCo-CurricularActivities:

1. Trainingofstudentsby a relatedexpert.
2. Assignments
3. Planningareport,Evaluating areportetc.
4. Presentationsbystudents onReportand Writingskills.
5. InvitedlecturesandpresentationsonrelatedtopicsbyExpertssuchasEnglishTrainers,Researc
hScholars etc.

PERSONALITY DEVELOPMENT AND COMMUNICATION SKILLS(SKILLCOURSE)

LEARNINGOUTCOMES:

Studentsat thesuccessful completionof the coursewill beable to

- Understandthemeaning,process,importance, typesandbarrierstocommunication;
- Developpublicspeaking, oralandwritten communicationskills;
- Understandtheimportanceofpreparationofcommunicationmaterial;
- Gainknowledgeofmediaofcommunication.
- Identifyhowtotheparticipateinmeetingsandinterviews;
- Understand the concept of personality and personality development and itssignificance.
- Understandanddevelopthetraitsandfactorsdeterminingpersonalityand
- Knowhowtoassessandenhanceone'sownpersonality

UNIT-I:

IntroductiontoPersonalityDevelopment

The concept of personality - Dimensions of personality – Theories of Freud & Erickson- Significanceofpersonalitydevelopment.Theconceptofsuccessandfailure:Whatissuccess? - Hurdles in achieving success - Overcoming hurdles - Factors responsible forsuccess– What is failure-Causes of failure.SWOT analysis.

UNITII:

Attitude&Motivation

Attitude-Concept-Significance-Factorsaffectingattitudes-Positiveattitude–Advantages– Negative attitude- Disadvantages - Ways to develop positive attitude - Differences betweenpersonalities having positive and negative attitude. Concept of motivation - Significance –Internalandexternalmotives- Importance of self- motivation- Factors leading to de-motivation

UNITIII:

Self-esteem

Termself-esteem-Symptoms-Advantages-Do'sandDon'tstodeveloppositiveself-esteem – Low self-esteem - Symptoms - Personality having low self esteem - Positive and negativeselfesteem.InterpersonalRelationships– Definingthedifferencebetweenaggressive,submissiveand assertivebehaviours– Lateral thinking.

UNITIV:

IntroductiontoCommunication

Meaning and Definition – Process – Functions – Objectives – Importance – Essentials ofGood Communication – Communication Barriers – Overcoming Communication Barriers –CrossCultural Communication.

UNITV:

TypesofCommunication&Essentialsoftskills

(a) WrittenCommunication

Need and functions of business letters – Planning and layout of business letters – Essentials of effective correspondence – Advantages and limitations of writtencommunication.

(b) OralCommunication

Meaning, nature and scope – Principles of Effective Oral Communication – Techniques ofEffective Speech – The Art of Listening – Principles of Good Listening – Advantages andLimitationsofOralCommunication.(Principlesandgoodpracticesinonlinecommunication e.g.Telephonic,Internet –VOIPVoiceover InternetProtocol.)

(c) Essentialsoft skills

(i) Groupdiscussion

(ii) Presentationskills

(iii) Problem-solving
(iv) Decision-making
(v) Creativity
(vi) Innovation
(vii) TeamWork

REFERENCEBOOKS:

1. Agrawal,Vijay.Dr.*PersonalityDevelopmentforstudents*.NewDelhi.BentenBooks.2014
2. Mile,D.J*Power ofpositivethinking*.New Delhi.Rohan BookCompany, 2004.
3. PraveshKumar.*AllaboutSelf-Motivation*.NewDelhi.GoodwillPublishingHouse.2005.
4. Smith,B.*BodyLanguage*.New Delhi:RohanBook Company.2004
5. Hurlock,E.B.*PersonalityDevelopment*,28thReprint.NewDelhi:TataMcGrawHill.2006
6. Mohan,Krishna.MeeraBenerjee.*DevelopingCommunicationskills*.MacmillanIndiaLtd,NewDelhi. 1990,
7. Barker,Alan.*ImproveyourCommunicationSkills*.KoganPageIndiaPrivateLtd.NewDelhi.2008.
8. Sing,O.P.*ArtofeffectiveCommunicationinGroupDiscusssionandInterview-ForCompetitiveExaminations*. New Delhi. S.Chandand Company Ltd. 2012.

SuggestedCo-CurricularActivities:

1. Trainingofstudentsby a relatedexpert.
2. Assignments
3. Seminars,GroupDiscussions,Debatesetc.
4. PresentationsbystudentsonpersonalityDevelopmentandcommunicationskills.
5. InvitedlecturesandpresentationsonrelatedtopicsbyExpertssuchasEnglishTrainers,Psychologistsetc.

SECRETARIAL PRACTICE(SKILLCOURSE)

LearningOutcomes:

Studentsat thesuccessful completionof the coursewill beable to;

1.Understandfundamentalknowledgeof**SecretarialPractices**thatcanbeappliedtoacareer.2.Haveknowledgeon officeadministration and identifyjob competencies.

3. Understandtheimportanceofrecordmanagementandalliedsections.

4. Comprehendtheadministrativeprocessinoffice

5. Identifythechallenges inthebackgroundofICT.

6. Enhanceskills,strategies andtechniquesto competewiththeglobalcompetenciesin

Unit:1

Sources of Corporate Finance Understand the concept of Corporate Finance and its Importance- Understand meaning of capital structure of a company - Understand various sources of ownedandborrowed capital-Comparedifferentsourcesof finance.

Unit:2

Capital raising: Understand the provisions and procedures related to Issue of Shares, DebenturesandAcceptanceof Public Deposits.

Unit:3

Secretarial Correspondence-Develop Communication skillsrelated to Members, Debentureholdersand Deposit holders.

Unit:4

Depository System:Understand the concept of Depository system and its Importance-Know theconstituentsof Depository System -Learn the Functioningof Depository System..

Unit:5

Payment of Dividend and Interest: Understand the concept of Dividend and Interest. • Comparebetween Interim and Final Dividend. • Learn about provisions on sources and for Declarationand PaymentofDividend.

References:Books:

1.CompanyLawandPractice-A comprehensive TextBookonCompaniesAct2013–

2.As amendedbycompanies (Amendment) Act2019- Dr.G. K.Kapoor andDr.Sanjay Dhamija - TaxmannPublicationsPvt.Ltd.24thEdition.CompaniesAct2013andRulesandFormswithconcisecommentary andReferences–

3 Corporate Professionals, 2019 Edition.Taxmann's Corporate Laws - By Anil

Kumar4Taxmann'sCorporateLaw andPractice-Majumdarand Kapoor.

5Business Finance - Principles and Problems - By P. V. Kulkarni - Himalaya

Publishing6.House-1988.FinancialManagement-ByDr.R.H.ShrivastavaPragatiPrakashan-1979.

7Corporate Finance - By B. L. Mathur - Subline Publication –

20028ManagerialFinance - Fred WestonandEvgeneFBrigham

9Principlesof CorporateFinance-Richard Breakey,StewardMyers

SuggestedCo-CurricularActivities

1. Trainingofstudentsbya relatedfieldexpertinOfficeManagement.
2. ReadingLocalDailynewspapereitherprintor online.
3. ReadingEditorialpages,blogsandwebsitesforvariousideologicalperspectives.
4. Assignments.
5. Discussthedebatesaroundanyrecenttrends,technologicaladvancementsandinventionofnewapplia ncesthat areto beused inmodern officer management.
6. Planandorganizeacapacitybuildingsessionforthestakeholders.
7. Seminars,Groupdiscussions,Quiz,Debatesetc.
8. Invitedlecturesandpresentationsonrecentglobaltrendsinofficemanagement.
9. MakevisittoaGovernmentofficeorreputedindustryorprivatefirminteractwithitsmembersand record their experiences and gain Hands on Experience of records maintenance, indexingandfiling procedures.

7.5 DATA BASE ADMINISTRATION(SKILLCOURSE)

LearningOutcomes:

Studentsat thesuccessful completion of thecoursewill beable to;

- Gainknowledgeof Databaseand DBMS.
- Understand the fundamental concepts of DBMS with special emphasis on relational datamodel.
- Demonstrate an understanding of normalization theory and apply such knowledge to thenormalizationofadatabase
- ModeldatabaseusingERDiagramsanddesigndatabaseschemasbasedonthemodel.
- Createasmall databaseusing SQL.
- Store,Retrievedataindatabase.

UNITI

Overview of DatabaseManagement System: Introduction to data, information, database,databasemanagementsystems,file-basedsystem,Drawbacksoffile-BasedSystem,ClassificationofDatabaseManagement Systems,advantages ofdatabaseapproach

UNITII

Entity-Relationship Model: Introduction, the building blocks of an entity relationship diagram,classificationofentitysets,attributeclassification,relationshipdegree,relationshipclassification.

UNITIII

Relational Model: Introduction, CODD Rules, relational data model, concept of key, relationalintegrity,relational algebra, relational algebraoperations.

UNITIV

Structured Query Language: Introduction, History of SQL Standard, Commands in SQL,DataTypesin SQL, Data Definition Language

UNITV

StructuredQueryLanguage: SelectionOperation,ProjectionOperation,Aggregatefunctions,DataManipulationLanguageSet Operations,View, Sub Query.

References:

1. Database System Concepts by Abraham Silberschatz, Henry Korth, and S. Sudarshan,McGrawhill
2. DatabaseManagement SystemsbyRaghuRamakrishnan,McGrawhill
3. PrinciplesofDatabaseSystemsby J.D. Ullman
4. FundamentalsofDatabaseSystemsbyR.ElmasriandS.Navathe
5. SQL:TheUltimateBeginnersGuidebySteveTale.

SuggestedCo-CurricularActivities

1. Trainingofstudents byarelatedfieldexpertinPersonnelAdministration.
2. ReadingLocalDailynewspapereitherprintoronline.
3. ReadingEditorialpages,blogsandwebsitesforvariousideologicalperspectives.
4. Assignments.
5. DiscussthedebatesaroundanyrecentOrdinance,BillorActintheParliamentorStateLegislaturewith regard to service mattersof civilservants.
6. Planandorganizeacapacitybuildingsessionforthestakeholders
7. Seminars,Groupdiscussions,Quiz,Debatesetc.
8. Invitedlectures andpresentationsonrecentglobaltrendsinPersonnelAdministration.
9. MakevisittoaGovernmentofficeorreputedindustry,interactwithitsmembersandrecordtheirexperiencesonjobsatisfaction,promotions,motivationandinstitutionalarrangementsforgrievances.

LEGISLATIVEPROCEDUREANDPRACTICE

LearningOutcomes:

Studentsat thesuccessful completion of thecoursewill beable to;

1. Makefamiliarwithlegislativeproceduresandpractices.
2. Equipthestudentswiththeadequateskillsofparticipationindeliberativeprocessesanddemocratic decision making.
3. Understandcomplexpolicyissues,draftnewlegislation,analyzeongoingbills,makespeeches andfloorstatements.
4. Provideskillstobepartofalegislativesupportteamandexposethemtoreallifelegislativework.
5. Enhanceunderstandingofprocedures,practices,differentcommitteesandmotionsintheHouse.

Unit:1

Brief Introduction on Legislative bodies, roles and responsibilities-Constitutional Provisions ofLegislativeProcedures:Articles107-122,KindsofBills:OrdinaryBills,MoneyBills,FinanceBills,Constitution Amendment Bills and PrivateMemberBills.

Unit:2

PowersandFunctionsofPeople'sRepresentativesinLegislativeProcess:MembersofParliament,MembersofStateLegislatures, PoliticalHeads of Rural andUrbanLocalGovernments.

Unit:3

DraftingoftheBill-FirstReadingandDepartmentalStandingCommittee-SecondandThirdReading-Framing rules and regulations, Passage of the Bill, Consent by the President of IndiaandGazetteNotifications.

Unit:4

Legislative Committees in India: Role in reviewing government policies, finances, programmesand legislation, Types of Committees: Department Standing Committees, Select Committees,JointParliamentaryCommittees,PublicAccountsCommittee,EstimatesCommittee, BusinessAdvisoryCommittee, Ethics Committeeetc.

Unit:5

Budget process: Reviewing the Union Budget, Examination of Demands for Grants of Ministries,Working of Ministries-Motions and Hours in the House: Question Hour : Rules of puttingquestions,TypesofQuestions-RulesrelatingtoCallingAttentionMotion,AdjournmentMotion, Privilege Motion, Censure Motion, No-Confidence Motion, Cut Motion includingResolutions, Discussionand Short Discussion

I. References:

1. Basu,D.D,IntroductiontoConstitutionofIndia,Nagpur,LexisNexisButterworths,2018.
2. Jayal,N.G.,andMehta,P.(eds),TheOxfordCompaniontoPoliticsinIndia,OxfordUniversityPress, New Delhi, 2007.
3. Bhambri,P.C.,Parliamentary ControloverStateEnterprizeinIndia,DelhiMetropolitanBookDept, New Delhi, 1998.
4. H.Karla,PublicEngagementwiththeLegislatureProcess,PRSCentreforPolicyResearch,NewDelhi, 2011available athttp://www.prsindia.org.
5. Kaul,M.N.&S.L.Shakdher,PracticeandProcedureofParliament,NewDelhi,LokSabhaSecretariat, 2016.
6. Mehra,A.K,TheIndianParliamentandDemocraticTransformation,NewDelhi,Routledge,

2017.
7. Pai,Sudha&Kumar,A,(eds),TheIndianParliament:ACriticalAppraisal,OrientBlackSwan,New Delhi, 2014.
8. Shankar,B.&RodriguezV,TheIndianParliament:ADemocracyatWork,OxfordUniversityPress, New Delhi,2011.
9. Singh,D,TheIndianParliament:BeyondtheSealandSignatureofDemocracy,UniversalLawPublishing, Gurgaon, 2016.
10. Kapur,DandP.Mehta(eds),PublicInstitutionsinIndia:PerformanceandDesign,OxfordUniversity Press, New Delhi, 2005.
11. Kapur,D.,Mehta,P.&Vaishnab,M(eds),RethinkingPublicInstitutionsinIndia,OxfordUniversity Press, New Delhi,2017.
12. Kashyap,S.ReviewingtheConstitution,ShipraPublications,NewDelhi,2000.
13. Kashyap,S.OurParliament, NationalBookTrust,NewDelhi,2015.
14. WebresourcessuggestedbytheTeacherconcernedandtheCollegeLibrarianincludingreadingmaterial.

SuggestedCo-CurricularActivities

1. Trainingofstudentsbya relatedfieldexpert.
2. ReadingLocalDailynewspapereitherprintoronline.
3. Watchinglivestream ofsessionsofParliamentorStateLegislature.
4. ReadingEditorialpages,blogsandwebsitesforvariousideologicalperspectives.
5. Assignments.
6. DiscussthedebatesaroundanyrecentOrdinance,BillorActintheParliamentorStateLegislature.
7. Discussanycontemporarypracticeoreventthatviolatesthetruespiritofdemocracyandpolitical equality.
8. Seminars,Groupdiscussions,Quiz,Debatesetc.
9. Invitedlectures andpresentationsonrelatedtopicsbyexpertsinLegislativeProcedures.
10. ReadtheguidelinesissuedbySupremeCourtinlandmarkcasesrelatingtoPoliticalDefections ,Anti-democracyacts of political parties.

8.1.LEGAL LITERACY-RIGHTSAWARENESS

LearningOutcomes:

Studentsat thesuccessful completion of thecoursewill beable to;

1. Acquaintstudentwith thestructureandmannerof functioningofthelegalsystem inIndia.
2. UnderstandofthelawsrelatedtorightsapplicableinIndia.
3. Provideanoverviewofaccesstocourtsandenforcementofrights.
4. Develop an understanding of the formal and Alternate Dispute Redressal (ADR)mechanism that exist in India.

Unit:1

BriefunderstandingofLegalLiteracy-RightsandDutiesofcitizens-IndianConstitution-Fundamental Rights and other constitutional rights and enforcement of certain rights underArticle21with emphasis on Public InterestLitigation.

Unit:2

Laws relating to criminal jurisdiction-Provisions relates to FIR, Arrest, Bail, Search and Seizure-ImportantoffencesunderIndianPenalCode-OffencesagainstWomen-Dowry,Sexualharassmentandviolence,Juvenile justice.

Unit:3

Anti-terrorist laws-Implication of security and protection of Human Rights-Laws relating toConsumerrights and Cybercrimes.

Unit:4

System of Courts and Tribunals and their jurisdiction in India-Civil and Criminal courts, Writjurisdiction,specialized courts such as Juvenilecourts, Mahila courts etc.

Unit:5

Legal Services Authority Act, 1987 and Right to Free Legal Aid-Alternate Dispute ResolutionMechanism (ADR), Lok Adalats and Conduct of Legal Literacy camps-Role of NGOs inpromotinglegal awareness.

References:

1. Basu,D.D,IntroductiontoConstitutionofIndia, Nagpur,LexisNexisButterworths,2018.
2. Kashyap,S,OurConstitution:AnIntroductiontoIndia'sConstitutionandConstitutionalLaws,New Delhi, National Book Trust, 1994.
3. D.Srivastava, Sexual Harassment and Violence against Women in India : Constitutional andLegalPerspectivesinC.KumarandC.Chockalingam(eds)HumanRights,JusticeandConstitutionalEmpowerment, Delhi,OxfordUniversityPress,2015.
4. B.L.Wadhera, Public Interest Litigation- A Handbook, Universal Publications, NewDelhi,2016.
5. Aggarwal,N.,Womenand Lawin India,NewCenturyPublishingHouse,NewDelhi,2019.
6. KamalaSankaranandUjwalSingh(eds),CreatingLegalAwareness,OxfordUniversityPress,New Delhi, 2017.
7. IndianSocial Institute,NewDelhi,LegalLiteracyBooklets.
8. P.C.RaoandWilliamSheffiled,AlternateDisputeResolution:WhatitisandHowitworks,UniversalLawBooksand Publishers, New Delhi,2012.
9. ParmanandSingh,AccesstoJusticeandtheIndianSupremeCourt,10&11,DelhiLawReview,1981-82.
10. J.Kothari, CriminalLaw on Domestic Violence,Economic and PoliticalWeekly, 2005,Vol.40(46),pp., .4843-4849.
11. CentreforGood Governance,Rightto Information Act,2005:ACitizen'sGuide

12. A.Pandey,RightsoftheConsumer,NewDelhi, IndianSocialInstitute,2004.
13. Pandey,LawsrelatingtoCriminalJustice:ChallengesandProspectsinK.SankaranandU.Singh ,TowardsLegalLiteracy,NewDelhi,OxfordUniversityPress,2008,pp.61-77.
14. S.K.Garg,GuidetoLokAdalatsandFreeLegalServicesunderLegalServicesAuthoritiesAct,New Delhi, 2018.
15. WebresourcessuggestedbytheTeacherconcernedandtheCollegeLibrarianincludingreading material.

SuggestedCo-CurricularActivities

1. Trainingofstudentsbya relatedfield expert.
2. ReadingLocal Dailynewspapereitherprintoronline.
3. ReadingEditorialpages,blogsandwebsitesforvariousideologicalperspectives.
4. Assignments.
5. Discuss the debates around any recent Ordinance, Bill or Act in the Parliament or StateLegislature.
6. Discussanycontemporarypracticeoreventthatviolatestheequalityandprotectionagains t discrimination laws.
7. Seminars,Groupdiscussions,Quiz,Debatesetc.
8. Witness any incident occurred in surroundings that would be considered offensive underthe penal code and make a class-room presentation on it. Example: Offenses relates to IPC,ConsumerProtection Act, 1986, Filing a petition under RTIAct, 2005etc.,
9. Invited lectures and presentations on related topics by experts in jurisprudence andADRMechanism.
10. Read the guidelines issued by Supreme Court in landmark cases relating to Childabuse,domestic violence, sexualharassment atworkplace.

STATEADMINISTRATION

LearningOutcomes:

Studentsat thesuccessful completion of thecoursewill beable to;

- Understandthepoliticalsystemandgovernancestructureof AndhraPradesh.
- Identifytherolesandresponsibilitiesofvariousstategovernmentinstitutionsandbodies.
- Analyze the relationships between the executive, legislative, and judicial branches of the stategovernment.
- Gainknowledgeof thepolicy-making processinAndhraPradesh.
- Evaluatetheimpact ofpublicpolicies ondifferentsectors ofthestate.
- Developskillsinanalyzingpolicyalternativesandmakinginformedrecommendations.
- Explore the system of local governance, including panchayats andmunicipalities, in AndhraPradesh.
- Understandthe rolesand responsibilitiesoflocalgovernmentinstitutions.

Unit 1: Introduction to Andhra Pradesh
GovernmentFormationandhistory of AndhraPradesh
state
Thestructureof thestategovernment
Constitutionalprovisionsrelatedto thestategovernment
Role and functions of the Governor, Chief Minister, Council of Ministers, and the LegislativeAssembly

Unit2:StateLegislatureandLawmaking

The Andhra Pradesh Legislative Assembly and Legislative CouncilComposition, powers, and functions of the state legislatureLegislativeprocess: Introduction, consideration,andpassingofbillsCommitteesand theirrolein thelegislativeprocess

Unit3: StateExecutiveandAdministration

Structureandfunctions ofthestateexecutive
RoleandpowersoftheChiefMinisterandCouncilofMinistersStateb ureaucracy:Rolesandresponsibilitiesofcivilservants
Administrativedivisionsanddistrictadministration

Unit4:LocalGovernmentinAndhraPradesh

PanchayatiRajsysteminAndhraPradesh
Rural and urban local bodies: Gram Panchayats, Mandal Parishads, and MunicipalitiesPowers,functions, and financeof local governments
Decentralizedplanning anddevelopmentinitiatives

Unit5:PublicPolicyandWelfarePrograms

PublicpolicyformulationandimplementationinAndhraPradeshMaj or welfare programs and initiatives by the state governmentSocial welfare schemes for marginalized sections of societyHealth,education,and infrastructuredevelopmentprograms

References:

1. AndhraPradeshStateGovernment officialwebsite,textbookson Indianpolityandgovernance

2. AndhraPradeshPanchayatRajandRuralDevelopmentDepartment,textbooksonIndianpolityandgovernance

SuggestedCo-CurricularActivities

1. Trainingofstudents byarelatedfieldexpertin StateAdministration.
2. ReadingLocalDailynewspapereitherprintoronline.
3. ReadingEditorialpages,blogsandwebsitesforvariousideologicalperspectives.
4. Assignments.
5. Discuss the debates around any recent Ordinance, Bill or Act in the StateLegislature withregardto servicemattersofcivilservants.
6. Planandorganizeacapacitybuildingsessionforthestakeholders
7. Seminars,Groupdiscussions,Quiz,Debatesetc.
8. Invitedlecturesandpresentationsonrecentglobal trendsinStateAdministration.

LOCALADMINISTRATION

LearningOutcomes:

Students at thesuccessful completion of thecoursewill beable to;

1. UnderstandtheexistingcontextofLocalGovernmentInstitutionsinIndia.
2. HaveknowledgeontheneedofempowermentandautonomyofLGIs.
3. Provideanoverviewonfinancialresources andconstitutionalprovisions.
4. Analysetheissues,problemsandconflictsinLocalAdministration.
5. Developcommunicationskills tointeractwiththeelectedmembersandofficials.
6. Enhanceskills forobservation,organizing,networking, documentation.

Unit:1

LocalGovernment:Meaning,NatureandImportance,ThoughtsonLocalGovernmentsbyM.K.Gandhi, Jawaharlal Nehru and Dr.B.R.Ambedkar, Important Committees: BalwantRaiMehta(1957), Ashok Mehta (1978),L.M.Singhvi(1986).

Unit:2

Decentralization of powers (Political, Administrative and Economic) from the States to LocalInstitutions- 73rd and 74thConstitutional Amendment Acts-Empowering Local Governments-Decision making powers during crisis and disasters-Relationship between local governmentauthorities and Central and State Government service providers-Role of District Collector instrengtheningLGIs.

Unit:3

Revenue raising avenues for Local Governments-Grants, Aid and support from Centre and StateGovernments-Public Private Partnerships-Concept of Local Development-Village as aunit,SWOC analysis of a village, existing conditions, expected developmental opportunities, thegap,natural,governmentandprivateresources,year-wiseplanning,financesrequired-RoleofLocalGovernmentsinimplementationofwelfareanddevelopmentalprogrammesi.e.,(MGNREGS),(SGSY),(IAY)and(PURA).

Unit:4

Challenges for Local Administration, Financial, administrative and Political Constraints-Publicrelations in Local Administration-Need for training for elected representatives and otherstakeholders-Audit trainingand Participatorytraining.

Unit:5

PreparationofReports-MinutesandDocumentation-TypesofReports,ContentofMinutes-MethodsofDocumentation-BestpracticesofReportingonfunctioningofLocalAdministration-UseofICT in documentation.

References:

1. Basu,D.D,IntroductiontoConstitutionofIndia,Nagpur,LexisNexisButterworths,2018
2. NirajaGopalJayal,RepresentingIndia:EthnicDiversityandGovernanceofPublicInstitutions, 2006, PalgraveMcMillan Publications.
3. RVenkataRavi,EmpoweringRuralIndia:ExperimentsandExperiences,KanishkaPublishers,New Delhi, 2006.
4. SawaliaBihariVerma,EmpowermentofthePanchayatiRajInstitutionsinIndia,SarupandSons,New Delhi, 2006.
5. WorldBank,EmpowermentinPractice:AnalysisandImplementation,WorldBankInstitute,WashingtonD.C.

6. S.Chandrasekhar,PanchayatiRajandFinancialResources,RegalPublications,2008,NewDelhi.
7. RajeshTondonandMohiniKak(Eds),CitizenParticipationandDemocraticGovernance,NewDelhi, 2016.
8. AnandPrakash,StateandDistrictAdministration, WisdomPress,NewDelhi,2008.
9. N.Lalitha,RuralDevelopmentinIndia:EmergingIssuesandTrends,DominantPublishers,NewDelhi, 2014.
10. WebresourcessuggestedbytheTeacherconcernedandtheCollegeLibrarianincludingreading material.

SuggestedCo-CurricularActivities

1. Trainingofstudentsbya relatedfieldexpert.
2. ReadingLocal Dailynewspapereitherprintoronline.
3. ReadingEditorialpages,blogsandwebsitesforvariousideologicalperspectives.
4. Assignments.
5. DiscussthedebatesaroundanyrecentOrdinance,BillorActintheParliamentorStateLegislature.
6. Carryoutaresourcemappingofaselectedarea.
7. Planandorganizeacapacitybuildingsessionforthestakeholders
8. Seminars,Groupdiscussions,Quiz,Debatesetc.
9. InvitedlecturesandpresentationsonrelatedtopicsbyexpertsinLocalAdministration.
10. Make visit to a Self-Help Group or NGO, interact with its members and record theirexperiences.
11. Conduct an interview with an important person at the District Level using a structuredschedule (DistrictPanchayatOfficer /CEO ofZilla Parishad/DistrictCollector) anddocumenttheirinterventions inlocaladministration and recordtheirexperiences.

E-GOVERNANCE

Learningoutcomes

1. Gainingtheoreticalunderstandingabouttheconcept,theoryandmodelsof e-governance
2. Learningpracticalapplicationofe-governance indifferentwalksoflife
3. Awareness of various e-governance initiatives undertaken to deliver Public services to thestakeholders
4. Developingnecessary skillstouseandoperate e-governanceordigitalservicedelivery

UNIT– I

Introduction to E- Governance and Digital Technology: E-Governance – Meaning, ScopeandImportance.
DigitialTechnologyand ServicesDelivery.

UNIT– II

E-Governance and theoretical aspects: E-Governance Thories, Public and PrivatePartnership,Information Technology Act, 2000.

UNIT– III

Organization of Government Information in various departments: Detailed study ofinformationand Broadcasting Ministry ofGovernment ofIndia,
E-Governance in Agricultural and Rural
DevelopmentE-GovernanceinUrbanAdministration
E-GovernanceinSocial WelfareDepartment

UNIT– IV

Application of E-Governance in several Department of Andhra Pradesh: Mee-Seva, CARDandE-Procurement,
E-Governancein HigherEducation.
E-Governance in Health
Administration.E-Hearing.

UNIT– V

E-Governance – Security Issues: Accountabilty and Transparency. IT Security, Hacking, CyberCrimes,E-Goveranceopportunities, Challengeand Barriers.

RecommendedReadings:

1. Bellamy, Christine and John, Taylor (1998) Governing in the Information Age. OpenUniversityPress: Buckingham
2. Bhatnagar,SC(2004)E-Government:FromVisiontoImplementation.Sage:NewDelhi
3. Bouwman, Harry; Hooff, Bart van den; Vingaert, Lidwien van de; and Dijk, Jan van (2005)Information and Communication Technology in Organizations: Adoption, Implementation,Usesand Effects, SagePublications: New Delhi
4. Gosling, P. (1997) Government in the Digital Age. Government Information Quarterly, Vol.18,No. ER2. Bowerdean: London
5. Heeks, Richard (2006) Implementing and Managing eGovernment: An International text.Sage:London
6. Jones, S. G. (Ed.)(1995) Cyber Society, Computer mediated communication and Community.Sage:Thousand Oaks CA
7. Kooiman, J. (Ed.) (1993) Modern Governance: New Government – Society Interactions. Sage:London
8. Layne, K. and Lee J. (2001) Developing Fully Functional e-Government: A Four StageModel.GovernmentInformationQuarterly,18(2001),pp.122-36.Elsevier: Manchester UK

9. Marchionini, G. (1995) Information Seeking in Electronic Environments. The Press SyndicateoftheUniversity of Cambridge: New York

SuggestedCo-CurricularActivities

1. Trainingofstudentsbya relatedfieldexpert.
2. Reading Daily newspaper either print or online about the misuse of technology whichleadstocybercrimes.
3. Readingarticles,blogsandwebsitesforvariousideologicalperspectives.
4. Assignments.
5. Discussthedebatesaroundanyrecent technologicaladvancements.
6. Discussthecaselawsandjudgments reportedonE-Governanceinitiatives.
7. Seminars,Groupdiscussions,Quiz,Debatesetc.
8. Invited lectures and presentations on related topics by experts in Cyber SecurityespeciallythePolicepersonnel associatedwith thecasesofIT Act.

INTERNATIONALLAW

LearningOutcomes:

1. Evaluatethesubstanceandscopeofinternationallaw.
2. Awareofdevelopmentandenvironment.
3. Understanddifferent environmentalmanagements.
4. Assimilatethedynamics ofpeople'smovementsandenvironment.
5. Familiarizewithtechnosupportforenvironment.

Unit–1:Introduction

1. InternationalLaw:Nature,Scope,andEvolution
2. SourcesofInternationalLaw:Treaties,Customs,Conventions
3. DifferencesbetweenInternationalLawandMunicipalLaw.

Unit–II:InternationalOrganizations&Treaties

1. RecognitionofState
2. InternationalOrganizationsandSovereignty
3. InternationalTreaties

Unit–III:BasicConceptsofInternational Law

1. ExtraditionandAsylum
2. JurisdictionofStates:BasicPrinciplesandIssues
3. ProblemsofJurisdictionoverWaters,Land,AirSpaceandOuterSpace

Unit–IV:PrivilegesandImmunities

1. DiplomaticPersonnel:Classification,Privileges,andImmunities.
2. IndividualasaSubjectofInternationalLaw1:Nationality,Citizenship,Aliens,
3. IndividualasaSubjectofInternational Law2:Extradition,Exile,Asylum,Statelessness

Unit–V:DisplacedPersons

1. Refugeesandissues
2. Immigrantsandissues
3. Warand Prisoners ofWar

References

1.R.P.Anand,NewStatesandInternationalLaw(Vikas,).
2. AddaBozeman,TheFutureofLawinaMulticulturalWork(Princeton,)
3. CharlesDeVisscher,TheoryandRealityinPublicInternationalLaw,trans.PercyE.Corbet t(Princeton,)
4. DavidP.Forsythe,ThePoliticsofInternationalLaw(LynnRienner,)

Activities:

Assignments–Quiz–GroupDiscussion–ClassroomDebates–CurrentInternationalPolicies-DiscussiononPrevious Question papers–News Paper Clippings

INTRODCTION TO COMPUTERS(SKILLCOURSE)

LearningOutcomes:

Onsuccessfulcompletion ofthe coursethe studentswill beable to;

- Thestudentsare familiarizedwiththeevolutionofcomputers,HardwareandSoftware
- Thestudentsare enabledtoknowabouttheprogramminglanguagesincomputer.
- ThestudentsunderstandtheCharacteristicsofcomputersanditsimpactonbusinessandsociety.
- ThestudentswillunderstandtheimportanceofROM,RAMandHardDiskinworkingofcomputer.
- Thestudents'assesthemainfunctionsofoperatingsystemandtypesofoperatingsystem
- ThestudentswillunderstandtheworkingprocessofM.S.Office.
- ThestudentsunderstandtheMicrosoftword,workingtables,columns'
- Thestudentsfamiliarizedwith theM.S.EXCEL
- Thestudentsare familiarizedwiththeuseofPowerPoint presentations
- Thestudentsareenabledtoknowthemodern-daycommunicationwhichinvolvesTechnology

UNIT-I

HISTORYOFCOMPUTERS

a) Stagesintheevolutionofcomputer

b) Generationsofcomputer

c) Hardwareandsoftware

d) Stemsoftware:1)operating system2)languages 3)devicedrivers 4)utilityprograms.

e) 1).packages2).programminglanguages

UNIT-II

COMPUTER-INTRODUTION:

A) Characteristicsofcomputer

B) Blockdiagramof acomputer

C) Impactofcomputers onbusinessandsociety

D) Elementsofcomputer

i) DataAcceptingSysteminComputer

ii) DataStorage:a)PrimaryMemory(MainMemory):

- ROM
- RAM

b)SecondaryMemory

- HardDisk
- FloppyDisk
- CompactDisk

E) Typeof computers

F) Inputand outputdevices

UNIT-III

1). OPERATINGSYSTEM(OS)

A) Mainfunctionsofoperatingsystem

B) Typeofoperatingsystem

C) Diskoperatingsystem(dos)

D) Functionsofdiskoperatingsystem

E) Directoryandfile

F) Doscommands:

a) InternalCommandsinDOS

b) ExternalCommandsinDOS

2). MICROSOFT-OFFICE(M.S.OFFICE)

A) Commonofficeelements

B) HistoryofMicrosoftofficeversions1995to2011

C) Windows–basics

D) Mainicons in windowstheir ruses

E) Filemanagementunderwindows

F) Accessoriesinwindows

UNIT-IV

1) MICRO-SOFT-WORD(M.S.WORD)

A) wordprocessing-features

B) introductiontoM.Sword

C) creatingadocumentinM.Sword

D) workingwithtablesandcolumns

2).MICRO-SOFT-EXCEL(M.S.EXCEL)

A) Theexcelsheet–enteringnumbersin thesheet

B) FormulaeinExcel

C) FunctionsinExcel

D) Chartsand graphsinM.S. EXCEL

UNIT-V

1) POWERPOINT

A) Howto create slidesin power point

B) Creatingslidesthroughblankpresentation

C) Preparingforslideshow

2) MODERNCOMMUNICATION

A) Multimediadevices

B) Network-types andtopologies

C) Internet

D)Worldwide web(www)

E) Electronicmail(e-mail)

References

1. DR.K.KIRANKUMAR : FUNDAMENTSOFCOMPUTER.
2. PROF.J.L.NEOGY : RAPIDEXCOMPUTER COURSE.
3. A.V.REDDY : COMPUTERFUNDAMENTALS.
4. AMITGUPTA : PUSTAKMAHAL
5. V.K.JAIN : COMPUTERFORBEGINNERS
6. V.K.JAIN : BASICCOMPUTERPROGRAMMING
7. JAYANTNEOGY : INTERNETANDe-MAIL

SuggestedCo-CurricularActivities

1) InvitedLectures

2) casestudy analysis.

3) Debatesoninteresting topics

4) Seminars,GroupDiscussions, Quiz,etc.

5) Assignments

6) AlumniInteractions

7) PeriodicalinteractionswithSoftwareProfessionals

8) StudentPresentations.

PUBLIC SPEAKING(SKILLCOURSE)

LearningOutcomes:

- Todeveloppublic speakingskillsamong thestudents
- Totrainstudentsusepublicspeakingskillsforpersonalandsocialdevelopment

Unit-IIntroduction
PublicSpeaking—ImportanceforPersonal andSocialGrowth
Unit— IIElements ofPublicSpeaking
Speakers- Audience— Purpose— Massage— Medium-Response-Situation -Outcome
Unit— III Developing Capacity
Free from Fear — Practice - Physical Fitness-Breathing - Voice Modulation - KnowledgeExpansion
Unit—IV Preparations
FixingPurpose,Subject-TakingNotes-PPT,Videos,EntertainmentElements--1BodyLanguage
Unit—VPracticalsinPublicSpeaking
With Preparation - Without Preparation — Debates: for and against - Recording andReviewing

References

1. DaleCarnegie,HowtoDevelopSelf-ConfidenceandInfluencePeoplebyPublicSpeaking,Simon & Schuster, 2010
2. SwamiAmartyananda, EffectiveLifeManagement,AdvaitaAshrama,Kolkatta,2010
3. DaleCarnegie,HowtoenjoyyourLifeandYourJob,SimonandSchusterpublishers,2010

SuggestedCo-CurricularActivities

1) InvitedLectures

2) Casestudyanalysis.

3) Debatesoninteresting topics

4) Seminars,GroupDiscussions, Quiz,etc.

5) Assignments

6) AlumniInteractions

7) PeriodicalinteractionswithPeoplesRepresentatives.

LIFE

SKILLS(SKILLCOURSE)

LearningOutcomes:

- Tohelpstudentsinternalizelifeskills
- Totrainthestudents inapplyinglifeskillstoget successinlife.

Unit-I:Introduction

Identifyingself,innerpotentialsandsettinggoalsfor life.

Unit—II:OrganizingThoughtsandAttitude

Self Analysis — Critical Thinking — Creative Thinking — Focusing Mind on Goals-AchievingGoals

Unit— III:OrganizingBehavior and Daily Life

Formation of basic life habits and behavior — practicing habits and behaviors toEnhanceprogress in life

Unit—IV:SocialSkills

SocialSkills —Communication-Networking-Empathy

Unit—V:Decision MakingSkills

DecisionMaking-ExecutionSkills-RiskTakingAbility

References

1. LifeSkillTeachersManual,CBSE,NCERT,2019.
2. Swami Amartyananda, Effective Life Management, AdvaitaAshrama, Kolkatta,2010

SuggestedCo-CurricularActivities

1) InvitedLectures
2) Casestudyanalysis.
3) Debatesoninteresting topics
4) Seminars,GroupDiscussions, Quiz,etc.
5) Assignments
6) AlumniInteractions
7) PeriodicalinteractionswithExecutivesand

8.5 CO-OPERATIVE THEROY AND PRACTICE(SKILLCOURSE)

LearningOutcomes:

- Understand the various aspects of cooperative and the role of cooperative societiesandpolicy therein.
- .Haveabasic understandingof legal processesand bylaws.
- Appreciate the role played by socio-political processes in the implementation of lawsandpolicies pertaining tothe CooperativeSocieties.
- . Evaluate the functioning of laws, policies and institutions of Cooperative Societiesfromtheperspectiveofempowermentand other constitutional values.
- Understand the need for reforms in cooperative administration and the steps taken inthisdirection

UNIT–I

Meaninganddefinition ofandScopeandsignificanceof co-operation-features -objectives – benefits of co-operation- Co-Operation as a Form of Business Organization - International Co-OperativeAlliance(Ica) Principles

UNIT-II

Co-Operation as a Form of Business Organization - Cooperation Vs Capitalism - Co-Operation V/S Socialism - Co-Operation V/S Communism- evolution of cooperativemovementin India

UNIT-III

Co-Operative Education & Training - Origin And Growth Of Cooperative Education AndTraining In India- National Council For Cooperative Training- National CooperativeUnion Of India – Ncui- National Centre For Co-Operative Education-Ncce-CooperativeStructure InIndiaAnd AndhraPradesh

UNIT-IV

Types Of Cooperatives And Cooperative Credit- Legislative Framework With Respect ToIndia- Co-Operative Banking In India - Primary Agricultural Credit Societies (Pacs)-DistrictCentral Co-OperativeBanks(Dccb) -StateCooperativeBanks (Scb)

UNIT-V

Intuitional Framework For Cooperative Societies – Nabard- Consumer Co-Operatives-Dairy Cooperatives- Marketing Cooperatives- Scheduled Caste Cooperatives AndScheduled Tribe Cooperatives- Urban Co-Operative Banks- Employees Cooperatives/EmployeesCredit Societies

REFERENCEBOOKS

1 T.N.Hajela,. Cc-operepion-Principles, Problems and Practices, Konark Publishers PvtLtd.,Delhi 2000.

2 B.S.Mathur.Co-operationinIndia,SahityaBhawanAgra.

3.ICApublicationspertainingtostatementonCo-operativeIdentity.

4 G.R Madan,Co-operative movement in India, A Critical Appraisal,Mittal Publications,NewDelhi.

5Achievementsof thedairyco-operatives duringthelast100 years' .www.amuLcomlachievementsdairycoop.h1IV1'

6 "Cabinet Clears 110llI Constitutional Amendment Bill on Coop Societies'.www.newkerala.comlnkfullnews-I-140549.html

7 'Co-operation".www.agricoop.nic.in/AnnualReport06-07/COOPERATION.pdf

SuggestedCo-CurricularActivities

1) InvitedLectures
2) Casestudyanalysis.
3) Debatesoninteresting topics
4) Seminars,GroupDiscussions, Quiz,etc.
5) Assignments
6) AlumniInteractions
7) PeriodicalinteractionswithExecutivesandPeoplesRepresentatives

Document : 3 (5) B.Sc Zoology Syllabus-2023

ANDHRA PRADESH STATE COUNCIL OF HIGHEREDUCATION

Programme:B.Sc.Honoursin Zoology(Major)

w.e.f.AY2023-24

COURSESTRUCTURE

Year	Semester	Course	Titleof theCourse	No. ofHrs /Week	No. ofCredits
I	I	1	IntroductiontoClassicalBiology	3+2	4
	I	2	IntroductiontoAppliedBiology	3+2	4
	II	3	AnimalDiversity-I BiologyofNon-Chordates	3	3
			Animal Diversity-IBiologyofNon-ChordatesPracticalCourse	2	1
	II	4	CellandMolecularBiology	3	3
			CellandMolecularBiologyPractical Course	2	1
II	III	5	AnimalDiversity-IIBiologyof Chordates	3	3
			AnimalDiversity-IIBiologyof ChordatesPracticalCourse	2	1
		6	PrinciplesofGenetics	3	3
			PrinciplesofGeneticsPracticalCourse	2	1
		7	AnimalBiotechnology	3	3
			AnimalBiotechnologyPracticalCourse	2	1
		8	EvolutionandZoogeography	3	3
			EvolutionandZoogeographyPractical course	2	1
	IV	9	Embryology	3	3
			EmbryologyPractical Course	2	1
		10	AnimalPhysiology: LifeSustaining Systems	3	3
			AnimalPhysiology: LifeSustaining SystemsPracticalCourse	2	1
		11	Immunology	3	3
			ImmunologyPracticalCourse	2	1

Year	Semester	Course	Titleof theCourse	No. ofHrs /Week	No. ofCredits
III	V	12	PoultryManagement-I(PoultryFarming)	3	3
			PoultryManagement-I(PoultryFarming) PracticalCourse	2	1
		13	PoultryManagement-II(Poultry ProductionandManagement)	3	3
			Poultry Management-II (PoultryProductionandManagement)Practical Course	2	1
		14A	SustainableAquaculture Management	3	3
			SustainableAquacultureManagement PracticalCourse	2	1
		OR			
		14 B	LiveStockManagement-I(Biologyof DairyAnimals)	3	3
			LiveStockManagement-I(Biologyof DairyAnimals)PracticalCourse	2	1
		15A	Post-HarvestTechnologyofFishand Fisheries	3	3
			Post-HarvestTechnologyofFishand FisheriesPracticalCourse	2	1
		OR			
		15 B	LiveStock Management-II(Dairy ProductionandManagement)	3	3
			LiveStock Management-II(Dairy ProductionandManagement)Practical Course	2	1
	VI	Internship			
	VII		Courseswillbeavailable induecourse of time		
	VIII		Courseswillbeavailable induecourse of time		

SEMESTER-I

COURSE 1:INTRODUCTIONTOCLASSICALBIOLOGY

Theory Credits:4 5hrs/week

Learningobjectives

Thestudentwillbeabletolearnthediversityandclassificationoflivingorganismsandunderstandtheirchemical, cytological, evolutionaryandgeneticprinciples.

LearningOutcomes

1. Learntheprinciplesof classificationandpreservation ofbiodiversity
2. Understandtheplantanatomical,physiologicalandreproductiveprocesses.
3. Knowledgeonanimalclassification,physiology,embryonicdevelopmentandtheirecono micimportance.
4. Outlinethecellcomponents,cellprocesseslikecelldivision,hereditydandmolecularprocesses.
5. Comprehendthechemicalprinciplesinshapinganddrivingthemacromoleculesandlifeprocesses.

Unit1:Introductiontosystematics,taxonomyandecology.

Systematics–Definitionandconcept,Taxonomy–Definitionandhierarchy.

Nomenclature–ICBNand ICZN,Binomialandtrinomialnomenclature.

Ecology–Concept ofecosystem,Biodiversityand conservation.

Pollution and climate change.Unit2:EssentialsofBotany.

Theclassificationofplantkingdom.

Plant physiological processes (Photosynthesis, Respiration, Transpiration,phytohormones).

Structureofflower–Microandmacrosporogenesis,pollination,fertilizationandstructureofmonoand dicot embryos.

2.4Mushroomcultivation,floricultureandlandscaping.Unit3: EssentialsofZoology

3.1.TheclassificationofKingdomAnimaliaandChordata.

AnimalPhysiology–BasicsofOrganSystems&theirfunctions,HormonesandDisorders

DevelopmentalBiology–Basicprocessofdevelopment(Gametogenesis,Fertilization,CleavageandOrganogenesis)

EconomicZoology–Sericulture,Apiculture,AquacultureUnit4:Cellbiology,Geneticsand Evolution

Celltheory,Ultrastructureofprokaryoticandeukaryoticcell,cellcycle.

Chromosomesandheredity–Structureofchromosomes,concept ofgene.

CentralDogmaofMolecularBiology.

Originoflife

Unit5:Essentialsofchemistry

Definitionandscopeofchemistry,applicationsofchemistryindailylife.

Branchesofchemistry

Chemicalbonds–ionic,covalent,noncovalent–VanderWaals,hydrophobic,hydrogenbonds.

Green chemistryReferences

1. SharmaO.P.,1993.Planttaxonomy.2nd Edition.McGrawHillpublishers.
2. PandeyB.P.,2001.ThetextbookofbotanyAngiosperms.4th edition.S.Chandpublishers,NewDelhi,India.
3. JordanE.L.,VermaP.S.,2018.ChordateZoology.S.Chandpublishers,NewDelhi,India.
4. Rastogi, S.C., 2019. Essentialsof animal physiology.4th Edition. New AgeInternationalPublishers.
5. VermaP.S.,AgarwalV.K.,2006.Cellbiology, genetics,MolecularBiology,EvolutionandEcology.S. Chand publishers, NewDelhi,India.
6. SathyanarayanaU.,Chakrapani,U.,2013.Biochemistry.4th Edition.Elsevierpublishers.
7. JainJ.L.,SunjayJain,NitinJain,2000.FundamentalsofBiochemistry.S.Chandpublishers,New Delhi,India.
8. Karen Timberlake,WilliamTimberlake,2019.Basicchemistry.5th Edition.Pearsonpublishers.
9. SubrataSenGupta,2014.Organicchemistry.1st Edition.Oxfordpublishers.

ACTIVITIES:

1. Makeadisplaychart oflifecycleof nonfloweringplants.
2. Makeadisplaychartof lifecycleofflowering plants.
3. Studyofstomata
4. Activityto provethat chlorophyll is essentialforphotosynthesis
5. Studyofpollen grains.
6. Observationofpollen germination.
7. Ikebana.
8. Differentiatebetweenedibleandpoisonousmushrooms.
9. Visitanearbymushroomcultivationunitandknowtheeconomicsofmushroomcultivation.

10. DrawtheUltrastructureofProkaryoticandEukaryoticCell

11. VisittoZoologyLabandobservedifferenttypesofpreservationofspecimens

12. Hands-onexperienceofvariousequipment–
Microscopes,Centrifuge,pHMeter,ElectronicWeighingBalance,LaminarAirFlow

13. VisittoZoo/Sericulture/Apiculture/Aquacultureunit

14. Listoutdifferenthormonal,geneticandphysiological disordersfromthesociety

SEMESTER-I

COURSE2:INTRODUCTIONTOAPPLIEDBIOLOGY

Theory Credits:4 5hrs/week

Learningobjectives

Thestudentwillbeabletolearnthefoundationsandprinciplesofmicrobiology,immunology,biochemistry,biotechnology,analyticaltools,quantitativemethods,andbioinformatics.

LearningOutcomes

1. Learnthehistory,ultrastructure,diversityandimportanceofmicroorganisms.
2. Understandthestructureandfunctionsofmacromolecules.
3. Knowledgeonbiotechnologyprinciplesand itsapplicationsinfoodandmedicine.
4. Outlinethetechniques,toolsandtheirusesindiagnosisandtherapy.
5. Demonstratethebioinformaticsandstatisticaltoolsincomprehendingthecomplexbiological data.

Unit1:EssentialsofMicrobiologyandImmunology

History and Major Milestones of Microbiology; Contributions of Edward Jenner, LouisPasteur,Robert Kochand JosephLister.

GroupsofMicroorganisms–

StructureandcharacteristicsofBacteria,Fungi,ArchaeaandVirus.

Applicationsofmicroorganismsin–Food,Agriculture,Environment,andIndustry.

Immunesystem–

Immunity,typesofimmunity,cellsandorgansofimmunesystem.Unit2:EssentialsofBiochemistry

BiomoleculesI–Carbohydrates,Lipids.

BiomoleculesII–Aminoacids& Proteins.

Biomolecules III–Nucleicacids-DNAandRNA.

Basics of Metabolism – Anabolism and catabolism.Unit3:EssentialsofBiotechnology

History,scope,andsignificanceofbiotechnology.ApplicationsofbiotechnologyinPlant, Animal,Industrial and Pharmaceuticalsciences.

EnvironmentalBiotechnology–

BioremediationandBiofuels,BiofertilizersandBiopesticides.

Geneticengineering–

Genemanipulationusingrestrictionenzymesandcloningvectors;Physical, chemical, and biologicalmethodsofgenetransfer.

Transgenicplants–Stresstolerantplants(bioticstress–BTcotton,abioticstress–salttolerance).Transgenicanimals–Animal and disease models.

Unit4:Analytical Toolsandtechniquesinbiology –Applications

Applicationsinforensics –PCRandDNAfingerprinting

Immunologicaltechniques–ImmunoblottingandELISA.

Monoclonalantibodies–Applicationsindiagnosisand therapy.

Eugenicsand Genetherapy

Unit5:BiostatisticsandBioinformatics

Datacollectionandsampling.Measuresofcentraltendency–Mean,Median,Mode.

Measuresofdispersion–range,standarddeviationandvariance.Probabilityandtestsofsignificance.

Introduction,Genomics,Proteomics,typesofBiologicaldata,biologicaldatabases-

NCBI,EBI,GenBank; Protein3D structures, Sequencealignment

AccessingNucleicAcidandProteindatabases,NCBIGenomeWorkbench

REFERENCES

1. GerardJ.,Tortora,BerdellR.Funke,ChristineL.Case.,2016.Microbiology:AnIntroduct ion.11thEdition.Pearson publications,London, England.

2. Micale,J.PelczarJr.,E.C.S.Chan.,NoelR.Kraig.,2002.PelczarMicrobiology.5thEdition.McGr aw Education, NewYork, USA.

3. SathyanarayanaU.,Chakrapani,U.,2013.Biochemistry.4thEdition.Elsevierpublishers.

4. JainJ.L.,SunjayJain,NitinJain,2000.FundamentalsofBiochemistry.S.Chandpublishers,New Delhi,India.

5. R.C.Dubey,2014.AdvancedBiotechnology.S.ChandPublishers,NewDelhi,India.

6. ColinRatledge,Bjorn,Kristiansen,2008.BasicBiotechnology.3rdEdition.CambridgePublishe rs.

7. U. Sathyanarayana, 2005. Biotechnology. 1st Edition. Books and Allied Publishers pvt. ltd.,Kolkata.

8. Upadhyay,UpadhyayandNath.2016.BiophysicalChemistry,Principlesand Techniques.HimalayaPublishingHouse.

9. ArthurM.Lesk.IntroductiontoBioinformatics.5thEdition.Oxfordpublishers.

10. APKulkarni,2020.BasicsofBiostatistics.2ndEdition.CBSpublishers.

ACTIVITIES

1. Identificationofgivenorganismasharmfulorbeneficial.
2. Observationofmicroorganismsfromhousedustundermicroscope.
3. Findingmicroorganismfrompondwater.

4. Visittoamicrobiologyindustryorbiotech company.
5. Visittoawastewatertreatmentplant.
6. RetrievingaDNAorprotein sequenceofagene’
7. PerformingaBLASTanalysisforDNAandprotein.
8. Problemsonbiostatistics.
9. Fieldtripandawarenessprogramsonenvironmentalpollutionby differenttypesofwastesandhazardousmaterials.
10. Demonstrationonbasicbiotechnologylabequipment.
11. Preparationof3Dmodelsofgeneticengineeringtechniques.
12. Preparationof3Dmodels oftransgenicplantsand animals.

[**NOTE**: In the colleges where there is availability of faculty for microbiology and biotechnology, thosechapters need to be handled by microbiology and biotechnology faculty.In other colleges, the above topicsshallbedealtbyBotany andZoology faculty]

SEMESTER-II

COURSE3:ANIMALDIVERSITY-IBIOLOGY OFNON-CHORDATES

Theory Credits:3 3hrs/week

LEARNINGOBJECTIVES:

- Tounderstand thetaxonomicpositionofprotozoato helminthes.
- Tounderstand thegeneralcharacteristics ofanimals belongingto protozoatohemichordata.
- Tounderstandthestructuralorganizationofanimalsphylumfromprotozoatohemichordata.
- Tounderstand the originand evolutionary relationship of different phylafrom protozoa to hemichordata.
- Tounderstandtheoriginandevolutionaryrelationshipofdifferentphylumfrom annelidstohemichordates.

LEARNINGOUTCOMES:Bythecompletionofthe coursethegraduate should ableto–

- Describeconceptofanimalkingdomclassificationandgeneralcharactersof Protozoa
- ClassifyPoriferaand Coelenteratawithtaxonomickeys
- ClassifyPhylumPlaty&Nemathelminthes using examples, parasiticadaptation
- DescribePhylumAnnelida&Arthropodausingexamplesandeconomicimportanceofvermicomposting&economicimportanceofinsects.
- DescribeMollusca,Echinodermata&Hemichordatawithsuitableexamplesinrelationtothephylogeny

SYLLABUS:

UNIT-I

WhittakersfivekingdomconceptandclassificationofAnimalKingdom.
ProtozoaGeneralCharactersandclassificationuptoclasseswithsuitableexamples
ProtozoaLocomotion&nutrition
Protozoareproduction

Activity:Assignment/Seminarontheabove
Evaluation:Marks tobeawarded forwritten andoralpresentations

UNIT–II

PoriferaGeneralcharacters andclassification uptoclasseswithsuitableexamples
Canalsysteminsponges
Coelenterata Generalcharactersandclassificationuptoclasseswithsuitableexamples
Polymorphismincoelenterates&Coralsandcoral reefs

Activity:Assignment/Seminar/Quiz/Projectontheabove
Evaluation:EvaluationofWrittenpart+EvaluationoforalPresentation,AssessmentofstudentsinQuizparticipationandRanking-EvaluationofProjectReportandoralpresentation

UNIT– III

PlatyhelminthesGeneralcharactersand classification uptoclasseswith suitableexamples
ParasiticAdaptationsinhelminthes
NemathelminthesGeneralcharactersandclassificationuptoclasseswithsuitableexamples
Lifecycleandpathogenicityof*Ascaris lumbricoides*

Activity:Assignment/Seminar/Quiz/Project/Peerteachingontheabove
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

UNIT– IV

AnnelidaGeneralcharactersandclassificationuptoclasseswithsuitableexamples
Vermiculture-
Scope,significance,earthwormspecies,processing,Vermicompost,economicimportanceofvermicompost
ArthropodaGeneralcharactersandclassificationup toclasseswithsuitableexamples
Peripatus-Structureandaffinities

Activity:Assignment/Seminar/Quiz/Project/Peerteachingontheabove
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

UNIT– V

MolluscaGeneralcharactersandclassificationup toclasseswithsuitableexamples
PearlformationinPelecypoda
EchinodermataGeneralcharactersandclassificationuptoclasseswithsuitableexamplesWater vascularsysteminstarfish
Hemichordata Generalcharactersandclassificationup toclasseswithsuitableexamples
Balanoglossus-Structureandaffinities

Activity:Assignment/Seminar/Quiz/Project/Peerteachingontheabove
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

Co-curricularactivities(suggested)

- Preparationofchart/modelof phylogenictreeoflife,5-kingdomclassification
- VisittoZoologyMuseumorCoralIsland as partofZoological tour
- Chartsonpolymorphism
- Claymodelsofcanalsysteminsponges
- Plaster-of-parismodelof*Peripatus*
- Constructionofavermicompostineachcollege,manufactureofmanurebystudentsanddonatingto local farmers
- Charton pearl forminglayers usingclay
- Visittoapearlculturerearingindustry/institute
- Livemodelofwatervascularsystem
- Observationof Balanoglossusforitstubicoloushabit

REFERENCEBOOKS:

- L.H.Hyman,„*TheInvertebrates'VolI,IIandV*.–M.C.GrawHillCompanyLtd.

- Kotpal,R.L.1988-1992Protozoa,Porifera,Coelenterata,Helminthes,Arthropoda,Mollusca,Echinodermata.Rastogi Publications, Meerut.
- E.L.JordanandP.S.Verma,,*InvertebrateZoology'*S.ChandandCompany.
- R.D.Barnes,,*InvertebrateZoology'*by:W.B.SaundersCO.,1986.
- Barrington.E.J.W.,,,*InvertebratestructureandFunction'*byELBS.
- P.S.DhamiandJ.K.Dhami.InvertebrateZoology.S.ChandandCo.NewDelhi.
- Parker,T.J.andHaswell,,*AtextbookofZoology'*by,W.A.,MacMillanCo.London.
- Barnes,R.D.(1982).*InvertebrateZoology*, VEdition"

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SEMESTER-II

COURSE3:ANIMALDIVERSITY-IBIOLOGYOFNON-CHORDATES

Practical Credits: 1 2hrs/week

LEARNINGOBJECTIVES

- Tounderstandtheimportanceofpreservationofmuseumspecimens
- Toidentifyanimalsbased onspecialidentifyingcharacters
- Tounderstanddifferentorgansystemsthroughdemo orvirtualdissections
- Tomaintainaneat,labelledrecordofidentifiedmuseum specimens

SYLLABUS:

Studyofmuseumslides/specimens/models(Classificationofanimalsuptoorders)

- Protozoa: Amoeba*, Paramoecium, Paramoecium Binary fission and Conjugation,Vorticella,Entamoebahistolytica, Plasmodium vivax*
- Porifera:*Sycon,Spongilla,Euspongia,Sycon*-T.S&L.S,Spicules,Gemmule
- Coelenterata: *Obelia – Colony & Medusa, Aurelia, Physalia, Velella, Corallium,Gorgonia,Pennatula*
- Platyhelminthes: *Planaria, Fasciola hepatica, Fasciola* larval forms – Miracidium,Redia,Cercaria,*Echinococcusgranulosus,Taeniasolium, Schistosomahaematobium*
- Nemathelminths:*Ascaris(Male&Female),Drancunculus,Ancylostoma,Wuchereria*
- Annelida:*Nereis,Aphrodite,Chaetopteurs,Hirudinaria,*Trochophorelarva
- Arthropoda:Cancer,*Palaemon*,Scorpion,*Scolopendra,Sacculina,Limulus,Peripatus,* Larvae-Nauplius,Mysis,Zoea,Mouthpartsofmale&female*Anopheles*and*Culex,*Mouthpartsof HouseflyandButterfly.
- Mollusca:*Chiton,Pila,Unio,Pteredo,Murex,Sepia, Loligo,Octopus,Nautilus,* Glochidiumlarva
- Echinodermata:*Asterias, Ophiothrix,Echinus,Clypeaster,Cucumaria,Antedon,* Bipinnarialarva
- Hemichordata:*Balanoglossus,*Tornarialarva

Dissections:

Computer-aidedtechniquesshouldbeadoptedorshowvirtualdissectionsDissectionofedible(Prawn/Pila)invertebrateas per UGCguidelines

An“Animalalbum”containingphotographs,cutouts,withappropriatewriteupabouttheabove-mentionedtaxa.Differenttaxa/topicsmaybegiventodifferent setsofstudents forthis purpose

RFERENCEWEBLINKS:

- https://virtualmicroscopy.peabody.yale.edu/
- https://tnhm.in/category/assorted-gallery-for-vertebrates-and-invetebrates/invertebrates/
- http://www.nhc.ed.ac.uk/index.php?page=24.25.312
- https://biologyjunction.com/invertebrate-notes/
- https://lanwebs.lander.edu/faculty/rsfox/invertebrates/
- http://www.zoologyresources.com/uploadfiles/books/dc64b77d8769325515d17c945e461b45.pdf

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SEMESTER-II

COURSE4:CELL&MOLECULARBIOLOGY

Theory Credits:3 3hrs/week

LEARNINGOBJECTIVES

- Tounderstandthe cell and distinguish betweenprokaryoticandeukaryoticcell
- Tounderstandtheroleofdifferentcellorganellesin maintenanceoflifeactivities
- Toacquaintthe students withtheconceptsof celldivisionandcellcycle
- Toacquaintstudent withbasicconceptsofmolecularbiologyasto howcharacters are expressedwithacoordinatedfunctioningofreplication, transcription andtranslation inalllivingbeings
- Toacquaintthestudentsonthebiologicalimportanceofbiomolecules.

LEARNINGOUTCOMES:

The overall course outcome is that the student shall develop deeper understanding of what life isand how it functions at cellular level. This course will provide students with a deep knowledge inCelland molecularbiologybythecompletion ofthe coursethegraduateshall able to–

- Understand the basic unit of the living organisms and to differentiate the organisms by their cellstructure.
- Describe fine structure and function of plasma membrane and different cell organelles ofeukaryoticcell.
- Explainthecellcycleandbioenergeticsofthecell
- Understand the central dogma of molecular biology and flow of genetic information from DNAto proteins

- Understandthe geneexpressionphenomenonandbiologicalimportanceofbiomolecules

SYLLABUS:

UNIT– I CellBiology-I

Definition,history,prokaryoticandeukaryoticcells,virus,viroids,mycoplasma
Electronmicroscopic structureofanimalcell.
Plasmamembrane–ModelsandFluidmosaicmodel
Transportfunctions ofplasmamembrane-Active–passive-facilitated.

Activity:Modelpreparationofcell/Assignment/StudentsSeminar/Quiz/Project/Peerteachingon theabove
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

UNIT– IICellBiology-II

StructureandfunctionsofGolgicomplex&EndoplasmicReticulum
StructureandfunctionsofLysosomes&Ribosomes
StructureandfunctionsofMitochondria&Centriole
StructureandfunctionsofNucleus &Chromosomes

Activity: Model preparation of cell organelles/Assignment /Students Seminar /Quiz/Project/Peerteachingon theabove
Evaluation:Instructorsupposedtoprepareadetailed Rubricsfortheevaluationoftheaboveactivity

UNIT– IIICell Biology-III

CellDivision-mitosis, meiosis
Cellcycle–stages- checkpoints-regulation
Abnormalcell growth-cancer-apoptosis
Bioenergetics-Glycolysis-Krebscycle-ETS

Activity:Modelpreparationcelldivision/Assignment/StudentsSeminar/Quiz/Project/Peerteaching/ Reportwritingafter watching anyvideo on theabove
Evaluation:Instructorsupposedtoprepareadetailed Rubricsfortheevaluationoftheaboveactivity

UNITIV:MolecularBiology-I

CentralDogmaofMolecularBiology
Basicconceptsof-DNAreplication–Overview(Semi-conservativemechanism,Semi-discontinuousmode, Origin&Propagation ofreplication fork)
Transcriptioninprokaryotes–Initiation,ElongationandTermination,Post-transcriptionalmodifications(basics)
Translation– Initiation,ElongationandTermination

Activity:ModelpreparationofDNA/Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwritingafter watching anyvideo on theabove
Evaluation:Instructorsupposedtoprepareadetailed Rubricsfortheevaluationoftheaboveactivity

UNITV: MolecularBiology-II

GeneExpressioninprokaryotes(LacOperon);GeneExpressionineukaryotes
Biomolecules-Carbohydrates(Glucose-structure-properties-biological importanceonly)
Biomolecules-Protein(Aminoacid-structure- properties-biologicalimportanceonly)
Biomolecules- Lipids(Fattyacid-structure-properties-biologicalimportanceonly)

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwritingafterwatchinganyvideo on theabove
Evaluation:Instructorsupposedtoprepareadetailed Rubricsfortheevaluationoftheaboveactivity

Co-curricularactivities(Suggested)

- Modelofanimalcell
- Workingmodel ofmitochondria toencouragecreativityamongstudents
- Photoalbum ofscientistsofcell biology
- Chartsonplasmamembranemodels/cellorganelles
- Chartsoncentraldogma/lacoperon/geneticcode
- Modelofsemi-conservativemodelofDNAreplication
- Powerpoint presentationofanyofthe abovetopicsbystudents

REFERENCES:

- Lodish,Berk,Zipursky,Matsudaria,Baltimore,Darnell,„MolecularCellBiology"W.H.Freemanandco mpanyNewYork.
- CellBiologybyDeRobertis
- BruceAlberts,Molecular BiologyoftheCell
- Rastogi,Cytology
- Varma&Aggarwal,CellBiology
- C.B.Pawar,Cell Biology
- Molecular BiologybyFrei fielder
- InstantNotes in MolecularBiologybyBiosscientificpublishers andVivaBooksPrivateLimited
- JamesD.Watson,NancyH.Hopkins,„MolecularBiologyoftheGene"

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SEMESTER-II

COURSE4:CELL&MOLECULARBIOLOGY

Practical Credits: 1 2hrs/week

LEARNINGOBJECTIVES

- Acquaintingandskillenhancementintheusageof laboratorymicroscope
- Hands-onexperienceofdifferent phasesofcelldivision byexperimentation
- Developskillsonhumankaryotypingandidentificationofchromosomaldisorders
- Toapplythebasicconceptofinheritanceforappliedresearch
- Togetfamiliarwithphylogeny adgeologicalhistoryoforigin&evolutionofanimals

SYLLABUS:

1. Preparationoftemporaryslides ofMitoticdivisionswith onionroot tips
2. ObservationofvariousstagesofMitosiswithpreparedslides
3. ObservationofvariousstagesofMeiosiswithpreparedslides
4. Mountingofsalivarygland chromosomes ofChironomus
5. Testforcarbohydrateingivenbiologicalsample(Benedictstest)
6. TestforProteiningiven biologicalsample(Nitricacidtest-whitering)
7. Testforlipidinthe given biologicalsample (Saponificationtest)

RFERENCEWEBLINKS:

- https://cbi-au.vlabs.ac.in/
- https://www.youtube.com/watch?v=xhnUZAyNdQk
- https://www.youtube.com/watch?v=l8LXQq5_VL0
- https://www.labster.com/simulations
- https://www.sciencecourseware.org/BiologyLabsOnline/protected/TranslationLab/index.php
- https://virtual-labs.github.io/exp-analysis-of-carbohydrates-au/procedure.html
- https://www.labxchange.org/library/items/lb:LabXchange:f10fd7ad:lx_simulation:1
- http://www.zoologyresources.com/uploadfiles/books/dc64b77d8769325515d17c945e461b45.pdf

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SEMESTER-III

COURSE5:ANIMALDIVERISTY-IIBIOLOGY OFCHORDATES

Theory Credits:3 3 hrs/week

LEARNINGOBJECTIVES

- Tounderstandtheanimal kingdom.
- TounderstandthetaxonomicpositionofProtochordatatoMammalia.
- Tounderstandthe generalcharacteristicsofanimalsbelongingtoFishestoReptilians.
- Tounderstand the bodyorganization ofChordata.
- TounderstandthetaxonomicpositionofProtherianmammals.

LEARNINGOUTCOMES: Bythe completionof thecoursethegraduateshould able to–

- Describegeneraltaxonomicrulesonanimalclassificationofchordates
- ClassifyProtochordatatoMammaliawithtaxonomickeys
- UnderstandMammalswithspecificstructuraladaptations
- Understandthesignificanceofdentitionandevolutionarysignificance
- Understand the origin and evolutionary relationship of different phyla from Prochordata toMammalia.

SYLLABUS:

UNIT-I

GeneralcharactersandclassificationofChordatauptoclasses
SalientfeaturesofCephalochordata,SalientfeaturesofUrochordata
Structure and life history of *Herdmania*, Retrogressive metamorphosis –Process andSignificance
Cyclostomata,Generalcharacters,ComparisonofPetromyzonandMyxine

Activity:Modelpreparation/Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwriting after watching anyvideo on theabove
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

UNIT-II

GeneralcharactersofFishes,Salientfeatures Dipnoi
Scoliodon:Externalfeatures,Digestivesystem,Respiratorysystem
*Scoliodon*StructureandfunctionofHeart, StructureandfunctionsoftheBrain.
MigrationinFishes,TypesofScales

Activity: Model preparation /Assignment /Students Seminar/Quiz/Project/Peerteaching/Reportwritingafter watching anyvideo on theabove
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

UNIT-III

GeneralcharactersofAmphibia,GeneralcharactersofReptilia
Ranahexadactyla:Externalfeatures,Respiratorysystem,StructureandfunctionofHeart
*Ranahexadactyla*structureandfunctionsoftheBrain
Calotes:Externalfeatures,Digestivesystem,structureandfunctionof Brain
IdentificationofPoisonoussnakes

Activity:Modelpreparation/Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwriting after watching anyvideo on theabove
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

UNIT-IV

GeneralcharactersofAves
Columbalivia:Externalfeatures,Digestivesystem,Respiratorysystem
Columbalivia:Structureand functionofHeart,structureandfunctionofBrain
MigrationinBirds,Flightadaptationinbirds

Activity:Modelpreparation/Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwriting after watching anyvideo on theabove
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

UNIT-V

GeneralcharactersofMammalia
ClassificationofMammaliaupto sub -classes with examples
ComparisonofPrototherians,MetatheriansandEutherians
Dentitioninmammals,AquaticmammalsAdaptations

Activity:Modelpreparation/Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwriting after watching anyvideo on theabove
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

Co-curricularactivities (suggested)

- Preparation of charts on Chordate classification (with representative animal photos) andretrogressivemetamorphosis
- Claymodels of Herdmania and Amphioxus
- Visittolocalfish marketandidentification oflocalcartilaginous andbonyfishes
- Maintainingofaquariumbystudents
- Modeloffish heartandbrain
- Preparationofslidesofscalesoffishes
- Visit tolocal/nearbyrivertoidentifymigratoryfishesand preparestudynotes
- Preparation of Charts on above topics by students (Eg: comparative account of vertebrateheart/brain/lungs,identification ofsnakesetc.)
- Collecting and preparation of Museum specimens with dead frogs/snakes/lizards etc., and/or theirskeletons

- Additionalinputontypesofsnakepoisonsandtheirantidotes(studentactivity).
- Collectionofbird feathersand submissionofreport onPlumology
- Taxidermicpreparationofdeadbirds forZoologyMuseum
- Mappointingofprototherian andmetatherianmammals
- Chartpreparationfordentitionin mammals

REFERENCEBOOKS

- J.Z. Young, 2006. The life of vertebrates. (The Oxford University Press, New Delhi). 646 pages.Reprinted
- Arumugam,N.Chordate Zoology,Vol.2. SarasPublication.278pages.200figs.
- A.J. Marshall, 1995. Textbook of zoology, Vertebrates. (The McMillan Press Ltd., UK). 852pages.(Revisededition of Parker&Haswell, 1961).
- M. Ekambaranatha Ayyar, 1973. A manual of zoology. Part II. (S. Viswanathan Pvt. Ltd.,Madras).
- P.S.Dhami &J.K.Dhami,1981.Chordatezoology.(R.Chand&Co.).550pages.
- Gurdarshan Singh & H. Bhaskar, 2002. Advanced Chordate Zoology. Campus Books, 6 Vols.,1573pp., tables, figs.
- A.K. Sinha, S. Adhikari& B.B. Ganguly, 1978. Biology of animals. Vol. II. Chordates. (NewCentralBook Agency, Calcutta). 560 pages.
- R.L.Kotpal,2022.Moderntextbookofzoology,Vertebrates.(RastogiPubl.,Meerut).632pages.
- E.L.Jordan&P.S.Verma,1998.Chordatezoology. (S.Chand&Co.).1092pages.
- G.S.Sandhu,2005.ObjectiveChordate Zoology.CampusBooks,vii,169 pp.
- Sandhu, G.S. & H. Bhaskar, H. 2004. Textbook of Chordate Zoology. Campus Books, 2 vols., xx,964p., figs.
- Veena,2008.LowerChordata.(SonaliPubl.),374p.,tables,117figs.

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SEMESTER-III

COURSE5:ANIMALDIVERISTY-IIBIOLOGY OFCHORDATES

Practical Credits: 1 2hrs/week

LEARNINGOBJECTIVES

- Tounderstandtheimportanceofpreservationofmuseumspecimens
- Toidentifyanimalsbased onspecialidentifyingcharacters
- Tounderstanddifferentorgansystemsthroughdemo orvirtualdissections
- Tomaintainaneat,labeledrecordofidentified museumspecimens

SYLLABUS:

1. Protochordata:*Herdmania,Amphioxus,Amphioxus*T.Sthroughpharynx.
2. Cyclostomes:*PetromyzonandMyxine.*
3. Pisces:*Pristis, Torpedo, Hippocampus, Exocoetus, Echeneis, Labeo, Catla,Clarius, Channa,Anguilla*.
4. Amphibia:*Ichthyophis,Amblystoma, Axolotllarva,Hyla,*
5. Reptilia:*Draco,Chamaeleon,Uromastix,Testudo,Trionyx,Russelsviper,Naja,* Krait,*Hydrophis,Crocodile.*
6. Aves:*Psittacula,Eudynamis,Bubo,Alcedo.*
7. Mammalia: *Ornithorhynchus*,*Pteropus,Funambulus.*
8. **Dissections**-Asper
   UGCguidelines*ScoliodonIX*andX,
   Cranialnerves*Scoliodon*Brain
   Mountingoffishscales

Note:1.Dissections areto be demonstratedonlybythe facultyorvirtual.
2.LaboratoryRecord work shall besubmitted at thetimeofpracticalexamination.

RFERENCEWEBLINKS:

- https://nt7-mhe-complex-assets.mheducation.com/nt7-mhe-complex-assets/Upload-20190715/InspireScience6-8CA/LS15/index.html
- https://themammallab.com/
- http://abacus.bates.edu/acad/depts/biobook/LabConCh.htm
- https://virtualzoology.wordpress.com/scoliodon/
- http://www.zoologyresources.com/uploadfiles/books/dc64b77d8769325515d17c945e461b45.pdf

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SEMESTER-III

COURSE6:PRINCIPLESOFGENETICS

Theory Credits:3 3 hrs/week

LEARNINGOBJECTIVES

- Toprovidethebackgroundknowledgeonthehistoryofgeneticsandtheimportanceof Mendelianprinciples.
- Toprovidetherequiredknowledgeonthe geneinteractions
- Toacquaintthestudents,distinguishbetweenpolygenic,sex-linked,andmultipleallelicmodes ofinheritance andextrachromosomal inheritance.
- Tounderstandtheprinciplesofsexdeterminationinanimalswithareferencetohumanbeing,and sex-linked inheritance
- Tounderstandthehumankaryotypingandtheconceptofpedigreeanalysisbasics.

LEARNINGOUTCOMES: Bythe completionofthecoursethegraduateshould ableto–

- Tounderstandthehistoryofgenetics,gainknowledgebasicterminologyofgenetics
- To acquire knowledge on interaction of genes, various types of inheritance patterns existing inanimals with referencetonon-Mendelian inheritance.
- Toacquireknowledgeonchromosomalinheritance
- Acquiring in-depth knowledge on various of aspects of genetics involved in sexdetermination,
- Acquiring in-depth knowledge on human karyotyping, pedigree analysis and chromosomaldisordersconcepts of proteomics and genomics

SYLLABUS:

UNIT-I:

History of Genetics- Concepts of Phenotype, Genotype, Heredity, Variation, Pure lines andInbreedLines

MendelianPrinciplesonMonohybridcross,backcross andTestcross

MendelianPrinciples onDihybridcross

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwritingafterwatchinganyvideoon theabove/Problemsolving onMendelian principles

Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

UNIT-II:

Linkage - Definition, Types of linkage-complete linkage and incomplete linkage, Significanceoflinkage.

Crossing over - definition; Mechanism of crossing over: Chiasma Interference andcoincidence

GeneInteractions:Incomplete dominance,codominance,Pleiotropy

GeneInteractions**:** Lethalalleles,Epistasis,Non-Epistasis

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwritingafterwatchinganyvideo on theabove/Model preparation of linkage/crossingover

Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the aboveactivity

UNIT-III:

Polygenes(General Characteristics&examples)
MultipleAlleles(General Characteristicsand Blood groupinheritance)
Rhinheritanceerythroblastosisfoetalis
Extrachromosomalinheritance-KappaparticlesinParameciumand Shellcoilinginsnails

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwritingafterwatchinganyvideo on theabove/CasestudyonRh/Erythroblastosis foetalis
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the aboveactivity

UNIT-IV:

SexdeterminationChromosomaltheoryandGenicBalancetheory
Sex determination- Hormonal, Environmental and Haplo-diploidy
types4..3Sexlinked inheritance: X-linkedinheritance
4.4Sexlinkedinheritance:Y-linked&XY-linkedinheritance

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwritingafterwatching any video on the above/ Preparation of animated model /chart on sex determinationmethods
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the aboveactivity

UNIT-V:

Humankaryotyping,PedigreeAnalysis(basics)
Autosomal Recessive disorder-Sickle cell anaemia – causes, treatment, inheritance pattern,modes oftestingand prevention
AutosomalDominantdisorder-Huntingtondisease
BasicsonGenomics andProteomic

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwritingafterwatchinganyvideo on theabove/ Casestudyof a familyfor pedigreeanalysis
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the aboveactivity

Co-curricularactivities (Suggested)

- Observation of Mendelian / Non-Mendelian inheritance in the plants of college botanical gardenorlocal villageasastudent studyprojectactivity
- Observationofbloodgroupinheritanceinstudents,fromtheirparentsand grandparents
- Karyotypingand preparationofpedigreechartsforidentifyingdiseasesin familyhistory
- Chartsonchromosomaldisorders

REFERENCEBOOKS:

- Harper,P.(2010).Practical geneticcounselling.CRCPress.

- Kessler, S. (Ed.). (2013). Genetic counselling: psychological dimensions. Academic Press. 3.Stevenson,A. C., &Davison,B. C. (2016). Geneticcounselling.Elsevier.
- Evans,C.(2006).Geneticcounselling:apsychologicalapproach.Cambridge UniversityPress.
- References:
- Atlasof InheritedMetabolicDiseases.
- Mendelian Inheritance in Man: A Catalog of Human Genes and Genetic Disorders, Victor A.McKusick,.2VolI& II
- Stacy L Blachford (Editor) 2001. The Gale Encyclopedia of Genetic Disorders. Gale GroupPublishers,Vol.1 (A-L),Vol.II(M-Z).
- Limoine,W.R.andCooper,D.NB.1996:GeneTrophy,BiosScientificPub.Oxford.
- REFERENCES:
- Gardner, E.J., Simmons, M.J., Snustad, D.P. (2008). Principles of Genetics. VIII Edition. WileyIndia
- Snustad, D.P., Simmons, M.J. (2009). Principles of Genetics. V Edition. John WileyandSonsInc.
- Klug, W.S., Cummings, M.R., Spencer, C.A. (2012). Concepts of Genetics. X Edition.BenjaminCummings.
- Russell, P. J. (2009). Genetics- A Molecular Approach. III Edition. BenjaminCummings.
- Griffiths, A.J.F., Wessler, S.R., Lewontin, R.C. and Carroll, S.B. Introduction toGeneticAnalysis.IXEdition.W. H. FreemanandCo.
- JamesD.Watson, NancyH.Hopkins‘Molecular Biologyof theGene’
- GuptaP.K.,‘Genetics

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SEMESTER-III

COURSE6:PRINCIPLESOFGENETICS

Practical Credits: 1 2hrs/week

LEARNINGOBJECTIVES

- ToacquirepracticalknowledgeontheimportanceofMendelianprinciplesbysolvingtheproblems.
- Toprovidetherequiredknowledgeonthe geneinteractions
- ToacquaintthestudentsonHumankaryotype&pedigree analysisbasics
- Tounderstandthe variousgeneticconceptsthrough Virtuallabs

SYLLABUS:

1. StudyofMendelian inheritance usingsuitableexamples/Problems
2. Studyof linkagerecombination,genemapping usingthe data
3. Studyofhumankaryotypes
4. Bloodgroupingand Rhinhumans
5. Demonstrationofprenataldiagnosis(Virtuallab).
6. Amniocentesisdemo or virtual lab
7. DemonstrationofUltrasonography(Virtual lab).
8. Scoringdysmorphic featuresinsyndromicpatients
9. GeneticCounsellingmethods basedon casehistory
10. ConstructionandanalysisofPedigree

RFERENCEWEBLINKS:

- https://www.iitg.ac.in/cseweb/vlab/anthropology/Experiments/Mendels%20law/index.html
- https://learn.genetics.utah.edu/content/labs/
- https://virtuallabs.merlot.org/vl_biology.html
- https://blog.praxilabs.com/2020/06/30/dna-extraction-virtual-lab/
- https://jru.edu.in/studentcorner/lab-manual/agriculture/Fundamentals%20of%20Genetics.pdf
- https://academicworks.cuny.edu/cgi/viewcontent.cgi?article=1008&context=ny_oers
- https://sjce.ac.in/wp-content/uploads/2018/04/Cell-Biology-Genetics-Laboratory-Manual-17-18.pdf
- https://www.rlbcau.ac.in/pdf/Agriculture/AGP%20113%20%20Fundamentals%20of%20Genetics.pdf
- https://coabnau.in/uploads/1610707528_GPB3.2PracticalManual-Final.pdf

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SEMESTER-III

COURSE7: ANIMALBIOTECHNOLOGY

Theory Credits:3 3 hrs/week

LEARNINGOBJECTIVES:

- Toprovideknowledgeon animalcellandtissueultureandtheirpreservation
- To empower students with latest biotechnology techniques like stem cell technology, geneticengineering, hybridoma technology, transgenic technology and their application in medicine andindustryforthebenefit of livingorganisms
- Toexplain*invitro*fertilization,embryotransfertechnologyandotherreproductionmanipulationmethodologies.
- TogetinsightinapplicationsorrecombinantDNAtechnologyinagriculture,productionoftherapeutic proteins.
- Tounderstandprinciples ofanimalculture,mediapreparation.

LEARNINGOUTCOMES:

Thiscoursewillprovidestudentswithadeepknowledgeinanimalbiotechnology,bythecompletionofthecoursethegraduateshall ableto–

- GetknowledgeoftheVectorsandRestriction enzymesused inbiotechnology
- Describethe genedeliverymechanismandPCR technique
- Acquirebasicknowledge onmediapreparationandcellculturetechniques
- Understandthemanipulationofreproductionwiththeapplicationofbiotechnology
- UnderstandtheapplicationsofBiotechnologyinthefieldsofindustryandagricultureincludinganimalcell/tissueculture,stem celltechnologyandgenetic engineering.

SYLLABUS:

UNIT-I:

EnzymesandVectorsRestrictionmodificationsystems:Types I,IIandIII.

Modeofaction,nomenclature,applicationsofTypeIIrestrictionenzymesingeneticengineering

DNA modifying enzymes and their applications: DNA polymerases. Terminaldeoxynucleotidyltransferase, kinasesand phosphatases,and DNAligases

Cloning Vectors: Plasmid vectors: pBR and pUC series, Bacteriophage lambda and M13 basedvectors,Cosmids, BACs, YACs,

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwritingafterwatching any video on the above/ Preparation of models of Cloning vectors with biodegradablematerial/ Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the aboveactivity

UNIT-II:

Genedelivery:Microinjection,electroporation,biolisticmethod(genegun),liposomeandviral mediated delivery

PCR:BasicsofPCR.

DNASequencing:Sanger'smethodofDNAsequencing-traditionalandautomatedsequencing
Hybridizationtechniques:Southern,Northern andWesternblotting

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwritingafterwatchinganyvideoontheabove/VisittoanyclinicaltestinglaboratoryforhandsonexperienceofPCR Use
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the aboveactivity

UNIT-III:

NaturalandSyntheticCell cultures:primaryculture,secondaryculture,continuouscelllines
Organculture;Cryopreservationofcultures.
HybridomaTechnology:Cellfusion,ProductionofMonoclonalantibodies(mAb),Applicationsof mAb
Stemcells:Typesofstemcells,applications

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwritingafterwatching any video on the above/ Visit to any clinical testing laboratory for observation ofvariouscultures
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the aboveactivity

UNIT-IV:

Manipulationofreproductioninanimals:Artificial Insemination, Invitrofertilization
Manipulationofreproductioninanimals:Superovulation,Embryotransfer,Embryo cloning
TransgenicAnimals:StrategiesofGenetransfer;
Transgenic -sheep,-fish;applications

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwritingafterwatchinganyvideoontheabove/VisittolaboratoryforobservationofArtificialInsemination,Invitro fertilization/modelpreparation oftransgenic animal
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the aboveactivity

UNIT-V:

DNAfingerprinting
Application ofbiotechnologyinfisheries – monoculturein fishes, polyploidyin fishes
Genetherapy-application
Bioinformatics-concept-definition-databasetypes

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwritingafterwatchinganyvideo on the above/Casestudy
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the aboveactivity

REFERENCESBOOKS:

- Brown TA. (2010). Gene Cloning and DNA Analysis. 6th edition. Blackwell Publishing, Oxford,U.K.
- Clark DP and Pazdernik NJ. (2009). Biotechnology: Applying the Genetic Revolution. ElsevierAcademicPress, USA
- Primrose SB and Twyman RM. (2006). Principles of Gene Manipulation and Genomics, 7thedition.Blackwell Publishing, Oxford, U.K.
- Sambrook J and Russell D. (2001). Molecular Cloning-A Laboratory Manual. 3rd edition. ColdSpringHarbor LaboratoryPress
- Wiley JM, Sherwood LM and Woolverton CJ. (2008). Prescott, Harley and Klein'sMicrobiology.McGrawHill Higher Education
- BrownTA.(2007).Genomes-3.GarlandScience Publishers
- Primrose SB and Twyman RM. (2008). Genomics: Applications in human biology. BlackwellPublishing,Oxford, U.K.
- Animal Cells Culture and Media, D.C. Darling and S.J. Morgan, 1994.BIOS Scientific PublishersLimited.
- Methods in Cell Biology, Volume 57, Jennie P. Mathur and David Barnes, 1998. Animal CellCultureMethods AcademicPress.
- P.K.Gupta:BiotechnologyandGenomics,Rastogipublishers(2003).
- B.D.Singh: Biotechnology,Kalyanipublishers,1998(Reprint2001)

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SEMESTER-III

COURSE7:ANIMALBIOTECHNOLOGY

Practical Credits: 1 2hrs/week

LEARNINGOBJECTIVES

Thiscoursewillprovidestudentswithapracticalknowledgeinanimalbiotechnology,bythecompletionoft hecoursethegraduateshall able to–

- AcquireknowledgeonCloningvectorswidelyusedinbiotechnology
- Empowerwith theprocess ofDNAquantificationand amplification
- Explainpurificationofbiologicalcompoundsbypaper chromatography
- Getinsightmaintenance oflaboratoryapparatus
- Understandprinciplesofanimalculture,mediapreparation

SYLLABUS:

1. CloningVectors:Plasmidvectors:pBRandpUCseries,BacteriophagelambdaandM13basedvectors,C osmids, BACs, YACs, (Charts/Images/Models)
2. DNAquantificationusingDPAMethod.
3. Techniques:DNAFingerprinting
4. Separation,Purification ofbiological compoundsbypaper chromatography
5. Cleaningandsterilizationofglass andplasticwaresforcellculture.
6. Preparationofculturemedia.
7. AmplificationofDNA byPCR

Note:abovepractical maybedemonstrated inthelabordemonstrated byV-lab

RFERENCEWEBLINKS:

- https://vlab.amrita.edu/
- https://www.vlab.co.in/broad-area-biotechnology-and-biomedical-engineering
- https://blog.praxilabs.com/2020/06/30/dna-extraction-virtual-lab/
- http://mbvi-au.vlabs.ac.in/
- https://webstor.srmist.edu.in/web_assets/downloads/2021/18BTC203J-lab-manual.pdf
- https://webstor.srmist.edu.in/web_assets/srm_mainsite/files/files/BT%200312%20-%20ANIMAL%20CELL%20AND%20TISSUE%20CULTURE%20LABORATORY.pdf
- https://davjalandhar.com/dbt/biotechnology/SOP/BSc%20Biotechnology%20Semester%20V%20%26%20VI.pdf
- https://www.austincc.edu/awheeler/Files/BIOL%201414%20Fall%202011/BIOL1414_Lab%20Manual_Fall%202011.pdf

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SEMESTER-III

COURSE8:EVOLUTIONANDZOOGEOGRAPHY

Theory Credits:3 3 hrs/week

LEARNINGOBJECTIVES

- Toprovideknowledgeonorigin oflife,theoriesandforces ofevolution
- Toexplorethe evidencesof evolution
- ToExplain thetheories ofevolution
- Tounderstandtheroleof variationsand mutationsinevolutionoforganisms
- Tounderstandthezoogeographicaldistributionof animals

LEARNINGOUTCOMES:

The overall course outcome is that the student shall develop deeper understanding of what life isand how it functions at cellular level. This course will provide students with a deep knowledge inEvolution and zoogeography,bythecompletionofthe coursethegraduateshall able to–

- Understandtheprinciplesand forces ofevolutionof lifeon earth, the processofevolutionofnewspeciesandapplythesametodevelopnewandadvancedvarietiesofanimals
- Explainthedifferent evidencesof evolution
- Understandthetheoriesof evolution
- Explainthe various toolsforevolution
- Mapthedistributionofanimalsaccordingtozoological realms

SYLLABUS:

UNIT-I

Originoflife: differentancientconcepts-
OriginofEarthandSolarsystem:BigBangtheory,Primitiveatmosphere, formation ofmacromolecules
Biologicalevolution:Coacervates,Microspheres, formationofNucleicacids,Nucleoproteins
Formationofprimaryorganisms,evolutionofmodesofnutrition,oxygenrevolution,presentday atmosphere,evolution ofeukaryotes.
ExperimentalevidencesinsupportofBiochemicaloriginoflife(MillerandUreyexperiment)

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwritingafterwatchingan yvideo on theabove
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

UNIT-II

Palaeontologicalandtaxonomicalevidencesofevolution
Morphologicalandanatomicalevidencesofevolution
Embryologicalandphysiologicalevidencesofevolution
Evidencesfromconnectinglinks, missinglinksand biogeographicaldistribution

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwritingafterwatching any video on the above/Visit to Archaeological Museum for observation of fossilsEvaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactiv ity

UNIT-III

Lamarckism-NeoLamarckism
Germplasmtheory-AugustWeismann
Darwinism-TheoryofNaturalselection
Modernsynthetic theoryof evolution (NeoDarwinism)

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwritingafterwatchingan yvideo on theabove
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

UNIT-IV

Variations-types-sourcesofvariations-importanceinevolution
Mutations-classification-causes-significancein evolution
Isolationmechanisms-roleinevolution
Sewallwrighteffect,HardyWeinbergPrinciple

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwritingafterwatchingan yvideo on theabove
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

UNIT-V

Animaldistribution and barriersofdistribution
Zoogeographicalrealms –Palearctic&Nearcticregions
Zoogeographicalrealms –Neotropical &Ethiopianregions
Zoogeographicalrealms –Oriental&Australianregions

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Reportwritingafterwatchinga nyvideoontheabove/Casestudyontheobservationoffaunainthecollegelocality/intheresidentialarea
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the aboveactivity

Co-curricularactivities(Suggested)

•Chart on industrial melanism to teach directed selection, Darwin's finches toteach geneticdrift, collection of data on weight of children born in primary health centres to teach stabilizingselectionetc.

REFERENCESBOOKS:

- Ridley,M.(2004).Evolution.IIIEdition.BlackwellPublishing
- Hall,B.K. andHallgrimsson, B.(2008).Evolution.IVEdition. JonesandBartlettPublishers
- Douglas,J.Futuyma(1997).EvolutionaryBiology.SinauerAssociates.

- Minkoff,E.(1983).EvolutionaryBiology.Addison-Wesley.
- OrganicevolutionbyOrganicevolutionbyDr. Veer BalaRastogi,2019 KedarNath Ramnath
- PalaeontologyandZoogeographyOrganicevolutionbyDr.VeerBalaRastogi,2019KedarnathRamnath
- RastogiVB.1991.*OrganicEvolution.*KedarNathRamNathPublications,Meerut,UttarPradesh,India.
- StahlFW.1965.*MechanicsofInheritance.*Prentice-Hall.
- WhiteMJD.1973.*Animal CytologyandEvolution.*CambridgeUniv.Press

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SEMESTER-III

COURSE8:EVOLUTIONANDZOOGEOGRAPHY

Practical Credits: 1 2hrs/week

LEARNINGOBJECTIVES

- Acquaintingandskillenhancementin theusageoflaboratoryequipment
- Toapplythebasicconceptofinheritanceforappliedresearch
- Togetfamiliarwithphylogenyadgeologicalhistoryoforigin&evolutionofanimals
- Tounderstandthezoogeographicaldistributionof animals

SYLLABUS:

1. Studyof fossil evidences
2. Studyof homologyand analogyfromsuitable specimens and pictures
3. Studyof embryological evidences bycharts/ pictures
4. StudyofLamarckismwithimages/animations
5. StudyofDarwinism withimages/animation
6. Studyof connectinglinks/missinglinks images/charts
7. Phylogenyofhorsewithpictures
8. Studyof GeneticDrift byusingexamples ofDarwin's finches (pictures)
9. Visitto NaturalHistoryMuseumand submissionof report
10. Mappingdistributionof animalsaccordingtozoogeographicalregions.
11. Mappingzoogeographicalregions

RFERENCEWEBLINKS:

- https://www.labster.com/course-packages/evolution-and-diversity
- https://www.biointeractive.org/classroom-resources/stickleback-evolution-virtual-lab
- https://www.youtube.com/watch?v=tXbmPhrS4eA
- https://www.studocu.com/en-us/document/temple-university/bioe-lab-2-biomaterials/1632834116536-zoogeography-assignment/17915777
- https://guides.library.tulsacc.edu/c.php?g=932434&p=6720765
- https://bio.libretexts.org/Courses/Butte_College/BC%3A_BIOL_2_-_Introduction_to_Human_Biology_%28Grewal%29/Text/09%3A_Biological_Evolution/9.3%3A_Evidence_for_Evolution
- https://www.coursehero.com/study-guides/boundless-biology/evidence-of-evolution/

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SEMESTER-IV

COURSE9:EMBRYOLOGY

Theory Credits:3 3 hrs/week

LEARNINGOBJECTIVES

- The objective of this course is to provide a comprehensive understanding of the concepts of earlyanimaldevelopment.
- Students taking this course must develop a critical appreciation of methodologies specifically usedtostudythe process of embryonic development in animals.
- Inthiscoursedifferentconceptsofanimaldevelopmentwillbeelaborated
- Studentswill bemadefamiliarwith differentapproaches thathavebeenused tostudy embryology.
- Topicsthatwillbediscussedareorganogenesisand regeneration.

LEARNINGOUTCOMES:

The overall course outcome is that the student shall develop deeper understanding of concepts ofembryology.Thiscoursewillprovidestudentswithadeepknowledgeinembryology bythecompletionofthe course the graduate shall able to–

- Understandthehistoricalperspective andconceptsofembryology
- Acquireknowledgeon gametogenesis,fertilizationandcleavagepatterns
- Understandthefateof germinallayersand extraembryonicmembranes
- Explaintheprocessofregenerationincertain animals
- Examinetheprocessoforganogenesis

SYLLABUS:

UNIT-I:

Historicalperspectiveandbasic concepts:Phasesofdevelopment
Cell-Cellinteraction,Patternformation,Differentiationandgrowth
Differentialgeneexpression,
Cytoplasmicdeterminantsandasymmetriccelldivision

Activity:Assignment/StudentsSeminar/Quiz/Project/Peer teaching/Reportwriting afterwatchinganyvideo on theabove
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

UNIT-II:

Gametogenesis,Spermatogenesis,Oogenesis;
Typesofeggs,Eggmembranes; Fertilization(Externaland Internal)
Planesandpatternsofcleavage;TypesofBlastulae;Fatemaps
Earlydevelopment offrogand chick upto gastrulation

Activity:Assignment/StudentsSeminar/Quiz/Project/Peer teaching/Reportwriting afterwatchinganyvideo on theabove/Model preparation on cleavageplanes
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

UNIT-III:

FateofGermLayers
Extra-embryonicmembranes
Placenta(Structure,types andfunctionsofplacenta)
Amniocentesis

Activity: Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watchinganyvideo on theabove/Chart preparation on theplacenta
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the aboveactivity

UNIT-IV:

Metamorphosis:Changes,hormonalregulationsinamphibians
Regeneration: Modes of regeneration, epimorphosis, morphallaxis and compensatoryregeneration(in Turbellarians)
Ageing:ConceptsandTheories
Teratogenicagentsandtheireffectsonembryonicdevelopment

Activity: Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watchingany video on the above /Flow chart preparation on the process of metamorphosis highlighting theperiodicalchanges vs hormoneactivity
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the aboveactivity

UNIT-V:

OrganogenesisofCentralNervoussystem
OrganogenesisofEye,Ear
OrganogenesisofSkin
5.3OrganogenesisofCirculatorysystem
(*OrganogenesisinHuman needtobeexplained)

Activity: Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watchingany video on the above /Flow chart preparation on the process of organogenesis highlighting thegradual developments oforgan systems
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the aboveactivity

Co-curricularactivities(Suggested)

- Preparationofmodelsofdifferenttypesofeggsinanimals
- Chartonfrogembryonicdevelopment,fatemapof frogblastula,cleavageetc.
- Chartontheorganogenesis
- RBPTonthePlacenta
- Modelofextraembryonicmembrane
- Laboratoryobservation of chickembryonicdevelopment

REFERENCESBOOKS:

- DevelopmentalBiologybyBalinksy
- DevelopmentalBiologybyGerardKarp
- ChordateembryologybyVarmaandAgarwal
- EmbryologybyV.B.Rastogi

- AustenCRandShortRV.1980.*ReproductioninMammals*.CambridgeUniversityPress.
- GilbertSF.2006.*DevelopmentalBiology,*8thEdition.SinauerAssociatesInc.,Publishers,Sunderland,USA.
- Longo FJ.1987.*Fertilization.*Chapman&Hall,London.
- Rastogi VB and Jayaraj MS. 1989. *Developmental Biology.* KedaraNath Ram NathPublishers,Meerut,UttarPradesh.
- SchattenHandSchattenG.1989.*MolecularBiologyofFertilization.* AcademicPress,NewYork.

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SEMESTER-IV

COURSE9:EMBRYOLOGY

Practical Credits:1 2 hrs/week

LEARNINGOBJECTIVES

- Theobjectiveof thiscourseis toprovide acomprehensivepractical knowledgeonthe embryology
- Mustdevelopacriticalunderstandingoftheearlyembryologicalevents
- Acquireknowledgeonthedevelopmental stagesof chick
- Understandthehistologyofplacenta

SYLLABUS:

1. Study of whole mounts and sections of developmental stages of frog through permanent slides:Cleavagestages,blastula,gastrula,neurula,tail-budstage,tadpole(externalandinternalgillstages)
2. Study of whole mounts of developmental stages of chick through permanent slides: Primitive streak(13 and 18 hours), 21, 24, 28, 33, 36, 48, 72, and 96 hours of incubation (Hamilton and Hamburgerstages)
3. Studyofdifferent sectionsofplacenta(photomicrograph/slides)
4. Projectreportonchick embryodevelopment

RFERENCEWEBLINKS:

- https://praxilabs.com/en/3d-simulations/cultivation-and-preparation-of-the-virus-in-chick-embryo-virtual-lab
- https://vlab.amrita.edu/
- https://www.vlab.co.in/
- https://www.youtube.com/watch?v=p_tx88He8Pk
- https://core.ac.uk/download/143957972.pdf
- https://egyankosh.ac.in/bitstream/123456789/57549/1/Exercise%207%20Chick%20Embryo.pdf
- http://www.macollege.in/app/webroot/uploads/department_materials/doc_501.pdf
- http://www.zoologyresources.com/uploadfiles/books/dc64b77d8769325515d17c945e461b45.pdf

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SEMESTER-IV

COURSE10:ANIMALPHYSIOLOGY:LIFESUSTAININGSYSTEMS

Theory Credits:3 3 hrs/week

LEARNINGOBJECTIVES

- Toacquireknowledgeof organsystemsfunction.
- To develop the ability to integrate physiology from the cellular and molecular level to the organsystemand organismic level of organization.
- To Effectively read, evaluate and communicate scientific information related to physiologicalprocessesin thebody.
- Togainadeepknowledgeofcurrenttopics inphysiology.

LEARNINGOUTCOMES:

The overall course outcome is that the student shall develop deeper understanding of concepts ofPhysiology.Thiscoursewillprovidestudentswithadeepknowledgeinphysiologybythecompletionofthe course the graduate shall able to–

- Understandthe physiologyof digestionand hormonalcontrol ofdigestion
- Developacomprehensivepictureofrespiratoryphysiology
- Acquireknowledgeon theRenal physiology
- Understandthe physiologyofNerveand muscle
- Understandthephysiologyof heart

SYLLABUS:

UNIT-I:PhysiologyofDigestion

Structuralorganizationandfunctionsofgastrointestinaltractandassociated glands;
Vitamins&Mineralcompositionoffood&Mechanicalandchemicaldigestionoffood;
Absorptionsofcarbohydrates,lipids,proteins,water,mineralsandvitamins;
Hormonalcontrolofsecretionofenzymesin Gastrointestinaltract.

Activity:Assignment/StudentsSeminar/Quiz/Project/Peer teaching/Reportwriting afterwatchingany video on the above /Chart preparation on the hormonal control of secretion of enzymesEvaluation:Instructorsupposedtoprepareadetailed Rubricsfortheevaluationoftheaboveactivity

UNIT-II:PhysiologyofRespiration

StructuralorganizationofRespiratorysystem,Mechanismofrespiration,Controlofrespiration
Pulmonaryventilation; Respiratoryvolumesand capacities;
Transportofoxygen inbloodand dissociationcurves andthefactors influencingit
Transport of Carbon dioxide in blood; dissociation curves and the factors influencing it, Carbonmonoxide poisoning

Activity:Assignment/StudentsSeminar/Quiz/Project/Peer teaching/Reportwriting afterwatchinganyvideoontheabove/GroupdiscussionontheCO poisoning/Debateonthedissociationcurves

Evaluation:Instructorsupposedtoprepareadetailed Rubricsfortheevaluationoftheaboveactivity

UNIT-III:Renal Physiology

Structureof kidneyand its functional unit
Mechanismofurineformation
Regulationofwaterbalance
Regulationof acid-basebalance

Activity:Assignment/StudentsSeminar/Quiz/Project/Peer teaching/Reportwriting afterwatchingany video on the above /Group discussion on the Urine formation/Working model of KidneyEvaluation:Instructorsupposedtoprepareadetailed Rubricsfortheevaluationoftheaboveactivity

UNIT-IV:Physiologyofexcitingtissues

Neuronstructureandtypes
Nerveimpulsetransmission-(Myelinated,Non-myelinated,synaptic)
Ultrastructureof muscle
Molecularandchemicalbasisofmusclecontraction

Activity: Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watchingany video on the above /Group discussion on the impulse trasnmisson/Debate on the dissociationcurves
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the aboveactivity

UNIT-V: PhysiologyofHeart

Structureof mammalian heart,Coronarycirculation;
Structure and working of conducting myocardial fibers. Origin and conduction of cardiacimpulses
CardiacCycle-Cardiacoutputanditsregulation
Nervousandchemicalregulationofheartrate.Bloodpressureanditsregulation

Activity: Assignment /Students Seminar/Quiz/Project/Peer teaching/Report writing after watchingany video on the above /Group discussion on the phases of Cardiac output /case study on theBlood Pressure
Evaluation: Instructor supposed to prepare a detailed Rubrics for the evaluation of the aboveactivity

Co-curricularactivities(Suggested)

- Chartoncardiaccycle,humanlung,kidney/nephron structureetc.
- Workingmodel of human / anymammalian heart.
- Workingmodel ofhuman / anymammalian urine formation
- Chart/modelofsarcomere
- Chart/modelon nerveimpulse transmission

REFERENCESBOOKS:

- EckertH.*AnimalPhysiology:MechanismsandAdaptation.*W.H.Freeman&Company.
- FlorayE.*AnIntroductiontoGeneralandComparativeAnimalPhysiology.*W.B.Saunders Co.,Philadelphia.
- GoelKAandSatishKV.1989.*ATextBookofAnimalPhysiology*,RastogiPublications,Meerut,U.P.
- HoarWS.*General andComparativePhysiology.*PrenticeHall ofIndia,NewDelhi.
- LehningerAL. NelsonandCox. *PrinciplesofBiochemistry.*LangeMedicalPublications,NewDelhi.
- ProsserCLandBrownFA.*ComparativeAnimalPhysiology.*W.B.SaundersCompany,Philadelp hia.

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SEMESTER-IV

COURSE10:ANIMALPHYSIOLOGY:LIFESUSTAININGSYSTEMS

Practical Credits:1 2 hrs/week

LEARNINGOBJECTIVES

- Toacquireknowledgeof anatomyofcertainimportantorgans.
- Todeveloptheabilitytotestthebiologicalsample likesalivaandurine.
- ToEffectivelyestimatethebloodhaemoglobin.
- ToAcquireskilltousethe sphygmomanometerin recordingbloodpressure.
- ToobservetheECG

SYLLABUS:

1. Examination of sections of mammalian oesophagus, stomach, duodenum, ileum, rectum liver,trachea, lung, kidney
2. StudyofactivityofSalivaryamylaseunderoptimumcondition
3. QualitativetestsforidentificationofCarbohydrates
4. QualitativetestsforidentificationofProteins
5. Qualitativetestsforidentification of Fats
6. Urinetest forsugar, albumin
7. EstimationofhaemoglobinusingSahli'shaemoglobinometer
8. Recordingof blood pressureusingasphygmomanometer
9. Recordingoffrog'sheart beatunderinsituandperfusedconditions
10. ECGobservation-Spotting/identificationof curvesfromthe givenECG

RFERENCEWEBLINKS:

- https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham
- https://library.csi.cuny.edu/oer/virtuallabs-simulations#anatomy
- https://www.labster.com/simulations?course-packages=animal-physiology
- http://www.zoologyresources.com/uploadfiles/books/dc64b77d8769325515d17c945e461b45.pdf
- https://physiology.elte.hu/gyakorlat/jegyzet/Physiology_Pactical_(2013).pdf

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SEMESTER-IV

COURSE11:IMMUNOLOGY

Theory Credits:3 3 hrs/week

LEARNINGOBJECTIVES

- To promotecritical thinkingamongstudents.
- Toprovidestudentswithafoundationinimmunological processes
- Toprovidestudentswithknowledgeonhowtheimmunesystemworksbuildingontheirpreviousknowledge
- To clearlystatetheroleof theimmune system.
- Tocompare andcontrasttheinnateversusadaptiveimmunesystems.
- Toprovideanoverview oftheinteractionbetweentheimmunesystem andpathogens.

LEARNINGOUTCOMES:

The overall course outcome is that the student shall develop deeper understanding of concepts ofimmunology.This course will provide students with a deep knowledge in immunology bythecompletionofthe course the graduate shall able to–

- Articulatetherolesofinnaterecognitionreceptorsinimmuneresponses
- Compareandcontrasthumoralversuscell-mediatedimmuneresponses
- Distinguishvariouscelltypesinvolvedinimmune responsesandassociatedfunctions;
- Distinguishandcharacterizeantibodyisotypes,development,and functions
- Understandthe roleofcytokinesin immunityandimmunecellactivation;
- Understand the significance the Major Histocompatibility Complex in terms of immune responseandtransplantation

SYLLABUS:

UNIT–I:Overviewof Immunesystem

Introductiontobasicconceptsin Immunology
Innateandadaptiveimmunity
Cellsofimmunesystem
Organsofimmunesystem

Activity:Assignment/StudentsSeminar/Quiz/Project/Peer teaching/Reportwriting afterwatchinganyvideo on theabove/Modelchart preparationof cells/organs ofimmunesystem
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

UNIT–II:**Antigens**

Basicpropertiesofantigens
BandT cellepitopes, paratopes
Haptensand adjuvants
Factorsinfluencingimmunogenicity

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Modelchartpreparationoforganogenesis
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

UNIT–III:Antibodies

Structureof antibody
Classesofantibodies
Functionsofantibodies
Monoclonalantibodies

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Modelchartpreparationofantibodies
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

UNIT–IV:WorkingofImmunesystem

Structureandfunctions ofmajor histocompatibilitycomplexes
Exogenouspathwayofantigen presentationandprocessing
Endogenouspathwayof antigenpresentation andprocessing
4.4.Basicpropertiesandfunctionsofcytokines

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/ModelchartpreparationofMHC
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

UNIT–V:Immunesysteminhealthanddisease

GellandCoombs'classificationandbriefdescriptionofvarioustypesofhypersensitivities
Introductiontoconceptsofautoimmunityandimmunodeficiency
GeneralintroductiontovaccinesTypesofvaccines, Immunizationprogramme
Organtransplantation-Graftrejection,immunesuppressors

Activity:Assignment/StudentsSeminar/Quiz/Project/Peerteaching/Modelchartpreparationofclassification of Hypersensitivity
Evaluation:InstructorsupposedtoprepareadetailedRubricsfortheevaluationoftheaboveactivity

Co-curricularactivities (suggested)

- Organizingawarenessonimmunizationimportanceinlocalvillageinassociationwith NCCand NSSteams
- Chartsontypesofcellsandorgansofimmunesystem
- Studentstudyprojectsonaspectssuchas– identificationofallergiesamongstudents(hypersensitivity),bloodgroupsintheclass(antigensandantibodiesdulyreported)etc.,asper the creativityandvision ofthe lecturerandstudents

REFERENCESBOOKS:

- Judy Owen, Jenni Punt, Sharon Stranford 2013 Kuby Immunology: International Edition W. H.Freeman
- AbbasAK,2011,CellularandMolecular Immunology7thEd.ElsevierHealthSciences–India.
- Delves P, Martin S, Burton D, Roitt IM 2011 Roitt's Essential Immunology. 12th Ed. Wiley-BlackwellScientificPublication, Oxford.
- MurphyK,2011Janeway'sImmunobiology.8th Ed.GarlandSciencePublishers,NewYork.

- Peakman M, and Vergani D. (2009). Basic and Clinical Immunology. 2nd edition ChurchillLivingstonePublishers,Edinberg.
- Richard Coico, Geoffrey Sunshine 2008 Immunology: A Short Course, 6th Edition Wiley-Blackwell
- SudhaGangal2013TextbookofBasicandClinicalImmunologyOrientBlackswanPrivateLimited -NewDelhi

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SEMESTER-IV

COURSE11:IMMUNOLOGY

Practical Credits:1 2 hrs/week

LEARNINGOBJECTIVES

- Toacquireknowledgeonthedistributionoflymphoidorgans
- Tostudythe histologyoflymphoid organs
- Toacquaintwith theprocess ofbloodgroupingwithkit
- ToacquaintwiththeELISAtest
- Toacquaint withtheWidaltest

SYLLABUS:

1. Demonstrationoflymphoidorgans (asperUGCguidelines)
2. Histologicalstudyofspleen,thymusand lymphnodes(throughpreparedslides)
3. Blood groupdetermination
4. DemonstrationofELISA
5. DemonstrationofImmunoelectrophoresis
6. Testingfor Typhoid antigens byWidal test.
7. DifferentialLeukocyteCount
8. Isolationofmonocytesfromblood.
9. RapidPlasmaReagin(RPR)Test

RFERENCEWEBLINKS:

- https://vlab.amrita.edu/?sub=3&brch=69
- https://ivl1-au.vlabs.ac.in/List%20of%20experiments.html
- https://ivl2-au.vlabs.ac.in/List%20of%20experiments.html
- https://www.medicine.mcgill.ca/physio/vlab/immun/vlabmenuimmun.htm
- http://www.zoologyresources.com/uploadfiles/books/dc64b77d8769325515d17c945e461b45.pdf
- http://www.lucp.net/books-pdf/Lab%20Manual%20Dr.%20Idris%20Adewale%20Ahmed/15.%20BASIC%20IMMUNOLOGY.pdf
- https://www.avit.ac.in/lab/immunology_bioprocess_engineering_lab/download/17BTCC89/lab_manual.pdf
- https://www.urmc.rochester.edu/MediaLibraries/URMCMedia/labs/frelinger-lab/documents/Immunology-Lab-Manual.pdf
- https://webstor.srmist.edu.in/web_assets/downloads/2021/18BTC106J-lab-manual.pdf

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SEMESTER-V

COURSE12:POULTRYMANAGEMENT-I (POULTRYFARMING)

Theory Credits:3 3hrs/week

LEARNINGOUTCOMES:

Studentsat thesuccessful completion of thecoursewill beable to

- EvaluatethestatusofIndian PoultryIndustry
- Explainthe ScientificPoultrykeeping
- ComparethediversifiedPoultrypractices
- Inspectthedifferentbreeds ofchicken

SYLLABUS:

Unit1 IndianpoultryIndustry

ImportanceofpoultryfarmingandpoultrydevelopmentinIndia.
PresentstatusandfutureprospectusofpoultryIndustry
ClassificationofpoultrybasedongeneticsUtility

Unit-2ScientificPoultryKeeping

ModernbreedsofChicken
Presentdayeggproduction lines-meat production lines
Minibreeds-dwarfisminmini-Leghorns

Unit-3DiversifiedPoultry

DucksandGeese-classification-rearingsystem-classification-advantages
Guineafouls-guineafowlfarminginIndia-Production-varieties
Emu-rearing-Economicalaspects-commercialproducts

Unit-4DesiChickens:

Indigenousbreedsandeconomicalaspectsofdesichicken
Indigenousbreeds-Aseel-Chittagong-Kadaknath-Bursa
Improved varieties in India – Giriraja-Vanaraja-Girirani-Kalinga brown,Gramapriya,Swarnandhra

Unit-5BreedsfromCentralAvianResearchInstitute–Izatnagar

CARINirbheek-CARI-Shyama-HITCARI(NakedNeckCross)
CARI-PriyaLayer,CARI-SonaliLayer,
CARIBRO-VISHAL,CARI-RAINBRO,
Nandanamchicken-I,NandanamChicken-II,Nandanm-Quail

REFERENCES:

1. TextBookofPoultryScience,PVSreenivasaiah,WriteandPrintPublications,ISBNNo.978819297 0592, 8192970590
2. PoultrySciencePractices, NilothpalGhosh,CBSPublication &Distributions, 2015
3. PrinciplesofPoultryScience, 1996,CABPublishers, ISBN 9780851991221
4. ATextBookofAnimalHusbandry,C.C.Banerjee,OxfordandIBH,PublishCo,ISBN:9788120412 606

Websources:

5. https://www.drvet.in/p/e-books.html
6. https://byjus.com/biology/animal-husbandry-poultry-farming/
7. https://www.helpforag.app/2018/02/livestock-production-and-management-lpm_14.html?m=1

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SEMESTER-V

COURSE12:POULTRYMANAGEMENT-I (POULTRYFARMING)

Practical Credits: 1 2hrs/week

LEARNINGOUTCOMES:

Onsuccessfulcompletionofthispracticalcourse,studentshallbeableto:

- Identifydifferent types of Poultryrearingpractices
- Evaluatetheefficacyofdifferent typesofpoultrypractices inmaximizingyield
- Understandtheimportanceofdifferenthybridbreedsin poultry

SYLLABUS:

1. DifferenttypesofPoultryrearing(Studentshastoobserveanddrawthedifferenttypesofpoultryrearingsystems)
2. DifferenttypesofpoultryHousing-Models/Images/charts
3. Differentlayerbreedsimages/charts/Models(Observationofcharacters)
4. Typesofbroilersimages/charts/Models(IdentificationofimportantCharacters)
5. CARIbreedscharacters–images/charts
6. Nandanambreeds-images/charts(Identificationofcharacters)

*** (This practical is 70 % (Web based /virtual) 30% physical: student and teachers must browse thewebforthe specimensmodels– writedown theimportantcharacters based on thewebresources)

REFERENCES:

1. ATextBookofAnimalHusbandry,C.C.Banerjee,OxfordandIBH,PublishCo,ISBN:9788120412606
2. http://www.agritech.tnau.ac.in/expert_system/poultry/Poultry%20House%20Construction.html
3. https://petkeen.com/best-chicken-breeds-for-eggs/
4. https://garden.decorexpro.com/en/hozyajstvo/ptitsevodstvo/porody-brojlernyh-kur-s-foto-i-opisaniem.html

Co-CurricularActivities:

a) **Mandatory**:

1. ForTeacher:Trainingofstudentsbytheteacherinlaboratoryandfieldonthetechniquesofidentificationoflayers, broilersand managementpracticesinpoultry.
2. For Student: Studentsshall Individually visit a Poultry farm, make observations and report on theRearing, Housing, Brooding, Feeding and water management activities. The student shall submit ahandwritten Fieldwork/Project work Report on the observations along with pictures in the givenformatnot exceeding10 pages to teacher.
3. Max marksforFieldwork/Project workReport:05.
4. SuggestedFormatforFieldwork/Projectwork:*Titlepage,studentdetails,indexpage,detailsofplacevisited, observations made, findingsandacknowledgements*.
5. Unittests.(IE)

b) **SuggestedCo-CurricularActivities**

1. Web resources – visiting the web sites of CARI-IZATNAGAhttps://cari.icar.gov.in procuringadditional information on thepoultrybreeds
2. Web resources- visiting the web site of NANADANAMhttp://www.tanuvas.ac.in/ippmmadhavaram_tech.html
3. Collectionofadditionaldata ondifferent types ofPoultrybreeds
4. Seminar, Assignment,Groupdiscussion.Quiz,CollectionofMaterial,InvitedLecture,Videopreparationetc.

(POULTRYPRODUCTIONANDMANAGEMENT)

Theory Credits:3 3hrs/week

LEARNINGOUTCOMES:

Studentsat thesuccessful completion of thecoursewill beable to

- SuggestmeasureforHealth careinPoultry
- Evaluatetheeconomicsofpoultryproduction
- ElaboratethepoultryBreederflock management
- Differentiatethe poultryhatcherypractices

SYLLABUS:

Unit-1HEALTHCARE

Commonpoultrydiseases: bacterial,viral,fungal,parasiticandnutritionaldeficiencies.
Vaccinationscheduleforcommerciallayersandbroilers:factorsthatgovernvaccinationschedule; vaccinationprinciples type, methods, preand postvaccination care.
Disinfection:Typesofdisinfectants;modeofaction;recommendedprocedure;precautionandh andling.

Unit-2ECONOMICS

Economicsoflayerandbroilerproduction
Projectsreportsindifferentsystems ofrearingforlayer&broilers.
Feasibilitystudiesonpoultryrearing-incontext ofsmall unitsandtheirprofitability.
Export/import of poultryandpoultryproducts.

Unit-3BREEDERFLOCKMANAGEMENT

Layerandbroilerbreeder flockmanagementhousing&spacerequirements
Differentstageofmanagementduringlifecycle;Lightmanagementduringgrowingandlayingp eriod,Artificial insemination.
Feeding: Feed restriction, separate male feeding. Nutrient requirement of layer and broilerbreedersofdifferentagegroups.

Unit-4BREEDERHEALTHCARE

Vaccinationofbreederflock;differencebetweenvaccinationscheduleofbroilers andcommercialbirds.
Commondiseasesofbreeders(Infectiousandmetabolicdisorders)-prevention.
Fertilitydisorder-etiology,diagnosisandcorrectivemeasures.Selectionandcullingofbreederflocks

Unit-5HATCHERYPRACTICES

Managementprinciplesofincubation.
Factorsaffectingfertilityandhatchability.Selection,careandincubationofhatching eggs.Fumigation; sanitation and hatcheryhygiene.
Importanceofhatcheryrecords,breakevenanalysisofunhatchedeggs.
Computerapplicationsforhatcherymanagement

REFERENCES:

1. HVSChauhan,S.Roy,PoultryDiseases,DiagnosisandTreatment,NewAgeInternationalPublishers-2018

Webresources:

2. https://www.drvet.in/p/e-books.html
3. https://byjus.com/biology/animal-husbandry-poultry-farming/
4. https://www.helpforag.app/2018/02/livestock-production-and-management-lpm_14.html?m=1

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COURSE 13:POULTRY MANAGEMENT-II(POULTRYPRODUCTIONANDMANAGEMENT)

Practical | Credits: 1 | 2hrs/week

LEARNINGOUTCOMES:

Onsuccessfulcompletion ofthispracticalcourse,student shall beableto:

- IdentifyPoultrydiseasesbyobservation
- AnalyzePoultryestablishment feasibility
- UnderstandthePoultryRecords

SYLLABUS:

1. PoultryViraldiseases–Observationofhistopathologicalslides
2. PoultryFungalDiseases-Observationofhistopathologicalslides
3. PoultryBacterialDiseases-Observationofhistopathologicalslides
4. Feasibility studyofPoultryestablishment:(Preparationoffeasibilitystudyreportwithgiven parameters)
5. Rearingof Layers–(Preparationof Flowchart
6. Rearingofbroiler-Flowchart
7. Hatcheryrecords-Modelstudy/analysis-Reportwithmodifieddata

REFERENCES:

1. HVSChauhan,S.Roy,PoultryDiseases,DiagnosisandTreatment,NewAgeInternationalPublishers-2018
2. Flowcharthatchery:http://lms.tanuvas.ac.in/mod/resource/view.php?id=45106
3. Feasibility report:https://www.manage.gov.in/stry&fcac/content/19.%20Project%20Report%20on%20Layer%20Poultry.pdf

Co-CurriularActivities

a) Mandatory:

1. For Teacher: Training of students by the teacher laboratoryandfield on skills in different practicesemployedinpoultrywithregardtothediseasemanagement–analysisofpoultryproject-preparationofflowchart– Observation ofPoultryrecords–computerizationactivities
2. ForStudent:studentsshall(individually)visitaLayer/BroilerPoultryfarmingplaces(smallscale/corporate), make observations on practices- resources – management and marketing - analysisandsubmitahandwritten Fieldwork/Project work Reportof10pages withnecessary images.
3. Max marksforFieldwork/Project workReport:05.
4. Suggested Format for Fieldwork/Project work: *Title page, student details, index page, detailsofplacevisited, observations made, findings andacknowledgements*.
   6.(IE):Unittests.

b) SuggestedCo-CurricularActivities

1. PreparationofPoultrydiseases charts
2. Preparationof feasibilityreportpoultryestablishmentwithdifferentvariables
3. Seminar, Assignment, Groupdiscussion.Quiz,CollectionofMaterial,InvitedLecture, Videopreparationetc.

COURSE14A:SUSTAINABLEAQUACULTUREMANAGEMENT

Theory Credits:3 3hrs/week

LEARNINGOUTCOMES:

Studentsatthesuccessfulcompletion ofthis coursewillbeableto

- Evaluatethepresentstatus ofaquacultureattheGloballevel andNationallevel
- Classifydifferenttypes ofpondsused in aquaculture
- Demonstrateinducedbreedingofcarps
- Acquirecriticalknowledgeon commercial importanceofshrimps
- Identifyfinandshell fishdiseases

SYLLABUS:

Unit:1

PresentstatusofAquaculture–GlobalandNational scenario
Majorcultivablespeciesforaquaculture:freshwater,brackishwaterandmarine.
Traditional,extensive,modifiedextensive,semi-intensiveandintensiveculturesoffishandshrimp.
Design andconstructionoffishandshrimpfarms

Unit:2

Functionalclassificationofponds–headpond,hatchery,nurseryponds
Functionalclassification ofponds-rearing,production, stockingandquarantineponds
Needof fertilizerandmanureapplicationincultureponds
Physio-chemicalconditionsofsoilandwateroptimumforculture(Temperature,depth,turbidity,light,water, PH,BOD, $CO_2$and nutrients)

Unit:3

Inducedbreedinginfishes
Culture of Indianmajorcarps:Pre-stocking management(Dewatering, drying,ploughing/desilting;Predators,weedsand algalbloomsandtheircontrol, Limingandfertilization)
Cultureof Indianmajorcarps-Stockingmanagement
Cultureof Indianmajorcarps-post-stockingmanagement

Unit:4

Commercialimportance ofshrimp&prawn
Macrobrachiumrosenbergii-biology,seedproduction.
Cultureof*L.vannamei*– hatcherytechnologyandculturepractices
Mixedcultureoffishandprawns

Unit:5

ViraldiseasesofFinFish&shell fish
FungaldiseasesofFin&Shellfish
BacterialdiseasesofFinfish&Shell fish
Prophylaxisinaquaculture

REFERENCES:

1. PillayTVR&M.A.Dill,1979. Advances inAquaculture.FishingNewsBooksLtd.,London
2. StickneyRR1979. PrinciplesofWarmWaterAquaculture.JohnWiley&SonsInc.1981
3. BoydCE1982.WaterQuality ManagementforPondFishCulture.ElsivierScientificPublishingCompany.
4. BoseANet.al.1991.CostalAquacultureEngineering.Oxford&IBHPublishingCompanyPvt.Ltd.

Webresources:

5. http://www.fao.org/fishery/docs/CDrom/FAO_Training/FAO_Training/General/x6708e/x6708e06.htm
6. http://aquaticcommons.org/1666/1/Better-Practice3_opt.pdf
7. https://www.notesonzoology.com/india/fishery/fish-diseases-symptoms-and-control-fishery/871

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SEMESTER-V

COURSE14A:SUSTAINABLEAQUACULTUREMANAGEMENT

Practical Credits: 1 2hrs/week

LEARNINGOUTCOMES:

Onsuccessfulcompletion ofthispracticalcourse,student shall beableto:

- IdentifythecharactersofFreshwatercultivablespecies
- Estimatephysicochemicalcharacteristicsofwaterusedforaquaculture
- Examinethediseasesoffinand shell fish
- Suggestmeasurestopreventdiseasesinaquaculture

SYLLABUS:

a. Fresh water Cultivable species any (Fin & Shell Fish Specimens – Observation of morphologicalcharactersbyobservationand drawings)-5
b. Brackishwatercultivablespecies(Fin&Shellfish-Specimens-Observationof MorphologicalCharacterbyobservingdrawing)-5
c. Hands on training on the use of kits for determination of water quality in aquaculture (DO, Salinity,pH, Turbidity- Testing kits to be used for the estimation of various parameters/ Standard procedurecanbedemonstrated forthesame)
d. Demonstration of Hypophysation(Procedure of hypophysation to be demonstrated in thepracticallab with anyediblefish as model)
e. Viral diseases of Fin & Shell Fish (Observation of his to pathological slides / Charts/ Models of viralpathogens in fin/ shell fish – one edible specimen can be used for observation of same in thelaboratory)
f. Bacterial diseases of Fin & Shell Fish (Observation of his to pathological slides / Charts/ Models ofBacterial pathogens in fin/ shell fish – One edible specimen can be used for observation of same inthelaboratory)
g. Fungal diseases of Fin & Shell Fish (Observation of his to pathological slides / Charts/ Models ofBacterial pathogens in fin/ shell fish – One edible specimen can be used for observation of same inthelaboratory)

REFERENCES:

h. BoydCE1982.WaterQualityManagementforPondFishCulture.ElsevierScientificPublishingCompany
i. http://www.fao.org/fishery/docs/CDrom/FAO_Training/FAO_Training/General/x6708e/x6708e06.htm
j. http://aquaticcommons.org/1666/1/Better-Practice3_opt.pdf
k. https://www.notesonzoology.com/india/fishery/fish-diseases-symptoms-and-control-fishery/871

Co-CurricularActivities

a. Mandatory:

1. For Teacher: Training of students by the teacher in laboratory/field onBreeding- Induced breedingin carps -hatchery technology of *L. Vennami*- Farming techniques- disease diagnostic techniques—concepts–Demonstration @ anyaqualaboratory
2. For Student: Students shall (individually) visit a Hatchery/Farm/ Aqua diagnostic center and makecareful observations of the process method and implements- protocols and report on the same in 10pageshandwrittenFieldwork/Projectwork Report.
3. Max marksforFieldwork/Project workReport:05.

4. SuggestedFormatforFieldwork/Projectwork**:**Titlepage,studentdetails,indexpage,detailsofplacevisited, observationsmade, findings andacknowledgements.
5. (IE).Unittests.

b. SuggestedCo-CurricularActivities

1. PreparationofModel/Charts ofCultivablespeciesoffinfishshellfish
2. PreparationofModel/ChartofIdealfishPond-withthestandardsprescribed.
3. Observationof aquacultureactivitiesintheirarea(Observationofanyactivityrelatedtoaquaculturein thevicinityof thecollege/village)
4. PreparationofModel–chartsofFin/Shell fishDiseaseswitheco-friendlymaterial.
5. Assignments,Groupdiscussion,Seminar,Quiz,CollectionofMaterial,Videopreparationetc.,Invitedl ecture

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Theory Credits: 3 3hrs/week

LEARNINGOUTCOMES:

Studentsat thesuccessful completionof the coursewill beable to

- Selectthesuitablebreedsof livestock forrearing
- Relatethe anatomyofudder with let-down ofmilk
- Identifyandmanipulatethe reproductivebehaviourofcattle
- Inspecteconomicsofdairyfarming
- Apprisethevarious breedingtechniques employedin livestock

SYLLABUS:

Unit1:

Livestock census; Breeds of Dairy cattle, Buffaloes and Goats. Indigenous, Exotic andCrossbredCattle breeds

Unit2:

Anatomy of Udder; Development of udder; Lactogenesis and Galactopoiesis; let-down ofmilk.

Unit3:

Artificialinsemination;Oestrouscycle;Symptomsofheatincowsandbuffaloes. Conception,Pregnancydiagnosisincattle.Multiovulationandembryotransfertechnique.Cloning.

Unit4:

Economictraits of Dairycattle. Methods ofselection ofdairyanimals.

Unit5:

Systems of Dairy cattle breeding. Inbreeding, out breeding, Cross breeding, grading up.Breedingsystems (Cross breedingofcattle andgradingup ofbuffaloes).

REFERENCES:

1. TextbookofAnimalHusbandry-GC Benarjee
2. Handbook ofAnimal Husbandry–ICAR Edition
3. PrinciplesandpracticesofDairyFarm–JagdishPrasad

Webresources:

4. http://ecoursesonline.iasri.res.in/course/index.php?categoryid=42
5. https://vetsebooks.blogspot.com/p/e-books.html
6. https://www.basu.org.in/study-materials/veterinary-science/
7. https://vikaspedia.in/agriculture/livestock/cattle-buffalo/breeds-of-cattle-buffalo

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Practical Credits: 1 2hrs/week

LEARNINGOUTCOMES:

Onsuccessfulcompletionofthispracticalcourse, studentshallbeableto

- Examinethe points of dairycow
- Understandthebehavioralchangesofcowduringthereproductiveperiod
- Differentiatethemeritsanddemeritsofcrossbreedsincattle

SYLLABUS:

1. Points dairy cow. (Explanation with observation of charts- Model evaluation to be performedbythe student in the laboratory)
2. Identification of different breeds of dairy cattle and buffaloes. (Observation of Charts ofbreeds in the laboratory- at least 3 breeds should be identified by the students in their localitywith video,photo)
3. Male and female reproductive systems of cow – Model/ Chart (Student has to draw a labeleddiagram of the male and female reproductive systems of cow – acquire skill to identify theparts).
4. Symptoms of heat in cow (Study and Understanding the physiological symptoms duringheat).
5. Artificialinsemination(Flowchartofimplements–Procedure-precautions)
6. Pregnancydiagnosisincattle.
7. Study comparative merits of cows and buffaloes; zebu and cross bred cows (Examination ofmerits

REFERENCES:

1. Principlesandpracticesof DairyFarm–JadishPrasad
2. Dairycowpoints:https://www.icar.org/Guidelines/05-Conformation-Recording.pdf
3. Pregnancy test protocol:https://cgspace.cgiar.org/bitstream/handle/10568/109408/Milk%20testing%20lab%20protocol.pdf?sequence=1&isAllowed=y

Co-CurricularActivities

a) Mandatory:

i. For Teacher: Training of students by the teacher in laboratory/fieldfornotlessthan15hoursonprinciples and practices of dairy industry-breeds –artificialinsemination-reproductivebehavior ofcowsetc. as per thesyllabus above.
ii. For Student: Students shall individually visit to any of the nearby cattle rearing centers/veterinaryhospital/Raithu BharosaKendraandmakeobservationsof theprocedureand qualityenhancement activitiesand submitahandwritten Fieldwork/ProjectworkReport in10pages.
iii. Max marksforFieldwork/ProjectworkReport:05.
iv. Suggested Format for Fieldwork/Project work Report: Title page, student details, index page,detailsof placevisited,observations made, findings andacknowledgements
v. (IE)Unittests,

b) SuggestedCo-CurricularActivities:

1. Collectionofvariouscattlebreedimagesfromthe webtoprepare aalbum
2. Visit the sites of Veterinary colleges in India and preparation of brief report on the videosandcontent/ employment details
3. Sketch amodel dairyfarm with details
4. Invitedlectureandpresentationon relatedtopicsbyexperts
5. Seminar, Assignment, Group discussion. Quiz, Collection of Material, invited lectures, Videopreparationetc.

Theory Credits: 3 3hrs/week

LEARNINGOUTCOMES: Studentsat thesuccessfulcompletionofthiscoursewill beableto

- Identifythetypesofpreservation methodsemployedinaquaculture
- ChoosethesuitableProcessingmethodsin aquaculture
- Maintain thestandard qualitycontrol protocols laid down in aquaindustry
- Identifythe bestSeafoodqualityassurancesystem

SYLLABUS:

Unit–IHandlingandPrinciplesof fishPreservation

Handling of fresh fish, storage and transport of fresh fish, post mortem changes (rigor mortis andspoilage),spoilagein marinefish and freshwaterfish.
Principlesof preservation–cleaning,loweringoftemperature,risingof temperature,denudation,useofsalt,useoffishpreservatives,exposuretolowradiationof gamma rays.

Unit–IIMethodsoffish Preservation

2.1Traditionalmethods-sundrying,saltcuring,picklingandsmoking.
2.2.Advancedmethods–
chillingoricing,refrigeratedseawater,freezing,canning,irradiationandAccelerated Freeze drying(AFD).

Unit–IIIProcessingand preservation offish andfishby-products

Fishproducts–
fishmincedmeat,fishmeal,fishoil,fishliquid(ensilage),fishproteinconcentrate,fishchowder,fish cake,fishsauce,fishsalads,fishpowder,petfoodfromtrashfish,fish manure.
Fish by-products – fish glue, Using glass, chitosan, pearl essence, shark fins, fishLeather andfish maws.

Unit–IVSanitationandQualitycontrol

Sanitationinprocessingplants-
EnvironmentalhygieneandPersonalhygieneinprocessingplants.
QualityControloffishandfisheryproducts–pre-processingcontrol,controlduringprocessingandcontrolafter processing.

Unit–VQualityAssurance,Management andCertification

5.1.SeafoodQualityAssuranceandSystems:GoodManufacturingPractices(GMPs);GoodLaboratory Practices (GLPs); Standard Operating Procedures (SOPs); Concept of Hazard AnalysisandCritical Control Points(HACCP)inseafoodsafety.
5.2NationalandInternationalstandards–ISO9000:2000SeriesofQualityAssuranceSystem, *CodexAlimentarius*.

REFERENCES:

1. SantharamR,NSukumaranandPNatarajan1987.Amanualofaquaculture,Oxford-IBH,NewDelhi
2. LakshmiPrasad's, FishProcessingTechnology2012,ArjunPublishingHouse
3. DrSunithaRai,FishProcessingTechnology,2015,Random Publications
4. SafetyandQualityIssuesinFishProcessing(WoodheadPublishingSeriesinFoodScience,Technology and Nutrition)by H A Bremner K.A Mahanthy, Innovations in Fishing and FishProcessingTechnologies,January2021

Webresources:

5. http://ecoursesonline.iasri.res.in/mod/page/view.php?id=145743
6. https://ecourses.icar.gov.in/e-Leaarningdownload3_new.aspx?Degree_Id=03

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Practical Credits: 1 2hrs/week

LEARNINGOUTCOMES:

Onsuccessfulcompletionofthispracticalcourse,studentshallbeableto:

- Identifythe qualityofaquaprocessed products.
- Determinethequalityoffisherybyproductsbyobservation
- Analyzetheprotocols ofaquaprocessingmethods

SYLLABUS:

1. Evaluationoffish/fisheryproductsfororganoleptic,chemicalandmicrobialquality.
2. Preparationofdried,curedandfermentedfishproducts
3. Examinationofsalt,protein,moistureindried/ curedproducts
4. Examinationofspoilageofdried/curedfishproducts,marinades,pickles, sauce.
5. Preparationofisinglass, collagenandchitosanfrom shrimpandcrabshell.
6. Developingflowchartsandexercisesinidentificationofhazards–preparationofhazardanalysis worksheet
7. Correctiveactionproceduresin processingof fish-flowchart-worksheetpreparation

(*Referthefollowingwebsitesforcompleteproceduremethodandestimationsofabovelistedpractical ’s)

REFERENCES:

1. DrSunithaRai,FishProcessingTechnology,2015,Random Publications
2. https://ecourses.icar.gov.in/e-Leaarningdownload3_new.aspx?Degree_Id=03
3. https://vikaspedia.in/agriculture/fisheries/post-harvest-and-marketing/processing-in-fisheries/fermented-products
4. https://krishi.icar.gov.in/jspui/bitstream/123456789/20500/1/Fermentation%20technology%20for%20fish.pdf
5. http://jebas.org/00200620122014/Abujam%20et%20al%20JEBAS.pdf
6. https://krishi.icar.gov.in/jspui/bitstream/123456789/20770/1/Training%20Manual_Hygienic%20drying%20and%20packing%20of%20fish.pdf
7. https://krishi.icar.gov.in/jspui/bitstream/123456789/20770/1/Training%20Manual_Hygienic%20drying%20and%20packing%20of%20fish.pdf
8. https://agritech.tnau.ac.in/fishery/fish_byproducts.html
9. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5352841/
10. http://www.fao.org/3/i1136e/i1136e.pdf
11. http://www.fao.org/3/x5989e/X5989e01.htm#What%20is%20sensory%20assessment)

Co-CurricularActivities

a. Mandatory:

1. For Teacher: Training of students by the teacher in laboratory/field in various steps of post-harvesttechniquesoffishes,ontheadvancedtechniquesinpost-harvesttechnology–Trainingofstudentson other employability skills in the Post-harvest sector of Aquaculture Industry- like Processing,Packing,marketingofprocessed aquaproducts.
2. For Student: Students shall (individually) visit - Any fish/shrimp Processing Plant/Packing industryandmakeobservationsonpostharvestingtechniquesandsubmitabriefhandwrittenFieldwork/ProjectworkReport with picturesanddata /surveyin10 pages.
3. Max marksforFieldwork/Project workReport:05.
4. Suggested Format for Fieldwork/Project work: *Title page, student details, index page, details ofplacevisited, observations made, findingsand acknowledgements*

5. (IE):Unittests,

b. SuggestedCo-CurricularActivities

1. Observationoffish/shrimpprocessingplants–visitwebsitesofprocessingcompaniesandrecordthedetails of thatUnit
2. Interaction withlocalfishermentoknow themethodof preservationand detailswiththeavailabletraditional technology
3. Collection of web resources on the Quality assurance, quality control measures in AquaIndustries-crosscheckingthe standards duringthevisit to anyprocessingunits.
4. Assignments, Seminar, Group discussion. Quiz, Collection of Material, invited lectures, Videopreparationetc.,

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Theory Credits: 3 3hrs/week

LEARNINGOUTCOMES:

Studentsat thesuccessful completion of thecoursewill beable to

- Identifyand suggestthe suitable housingsystem forthedairyfarming
- Understandmanagementpracticesforthedairyfarming
- Learntheprocessofmilkpasteurization
- Preparecreamfrommilk

SYLLABUS:

Unit-1: of Housing of Dairy cattle- Loose Housing and Conventional Dairy Barns. Drawing oflayouts for dairy cattle dwellings; Criteria for selecting site for establishing Dairy farm buildings;Waterrequirement ofdairyanimals.Systems

Unit-2:

Management of different classes of Dairy animals- Milk producing animals, pregnant animals dryanimals,heifersandcalves.ManagementpracticesforDairyfarm;Identification,Dehorning,Castration ,Deworming,Vaccination, Disinfection, andMilking.

Unit-3:

(a) Pasteurizationofmilk:Definition,objectsofpasteurization,objectionstopasteurization,Princi ples of heat exchange. Methods of pasteurization: LTLT, HTST and Uperization.(b)Sterilization of milk.Homogenization:Factorsinfluencinghomogenization

Unit-4:

Market milk: Toned milk, double toned milk, Reconstituted milk, Standardized milk and fullcreammilk–Standardsand methods ofmanufacture.

Unit-5:

Cream: Types of cream, composition, methods of cream separation, gravity and centrifugal methods,typesof creamseparators, factorsaffectingfatlosses inskimmilkand fatpercentageincream.

REFERENCES:

1. TextbookofAnimalHusbandry-GCBenarjee
2. HandbookofAnimal Husbandry–ICAR Edition
3. PrinciplesandpracticesofDairyFarm–Jagdish Prasad

webresources:

4. http://ecoursesonline.iasri.res.in/course/index.php?categoryid=42
5. https://vetsebooks.blogspot.com/p/e-books.html
6. https://www.basu.org.in/study-materials/veterinary-science/
7. https://vikaspedia.in/agriculture/livestock/cattle-buffalo/breeds-of-cattle-buffalo

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Practial Credits: 1 2hrs/week

LEARNINGOUTCOMES:

Onsuccessfulcompletion ofthispracticalcourse,student shall beableto:

- Designamodel dairyfarm layout
- Understandprocedureofmilkpasteurizationatmilkprocessingcenters
- Identifyvariousimportantmanagementpracticesindairyfarming

SYLLABUS:

1. Dairy Farmlayout(Inthelaboratorystudenthastosketchadairy farmwithallitscomponents)
2. Identificationofcows(studentshavetoidentifythebreedsofcowsformtheimages/charts–haveto identifyanytwobreeds in thevicinityof thecollege/ their locality).
3. Dehorningofcalves :(Method -protocol-precautions)
4. Castrationofbulls(Method–Apparatus-Time-importance)
5. Dewormingofdairycattle:(Schedule–method-benefits)
6. Pasteurizationofmilk(BatchMethod-procedure- Observation)
7. Sterilizationofmilk(Inbottlesterilization-procedure–protocol)
8. Creamseparation(Bygravitymethod-procedure-handsonexperiment)

REFERENCES:

1. HandbookofAnimal Husbandry–ICAR Edition
2. Dairyfarmlayout:https://www.youtube.com/watch?v=dmukHUEUvKc
3. Dehorningprocedure:http://www.omafra.gov.on.ca/english/livestock/dairy/facts/09-003.htm
4. Castrationofbulls:https://vikaspedia.in/agriculture/livestock/general-management-practices-of-livestock/castration-of-ruminants
5. Deworming:https://kvk.icar.gov.in/API/Content/PPupload/k0347_10.pdf
6. Pasteurizationofmilk:http://www.jnkvv.org/PDF/08042020170652part%203.pdf
7. http://ecoursesonline.iasri.res.in/mod/page/view.php?id=1690
8. Creamseparation:http://ecoursesonline.iasri.res.in/mod/page/view.php?id=147910

Co-CurricularActivities

a) Mandatory:

1. ForTeacher:Trainingofstudentsbytheteacherinlaboratoryandfieldon skills of dairymanagement – housing-management of dairy animals of various stages- procedure of preparation ofmarketable milk with procedureslikesterilization,pasteurizationand othertechniques.
2. For Student: Student shall (individually) visit a nearby dairy farm- house hold cattle rearing – makeobservations on aspects like housing – management – feed- milk- revenue- breed selection-qualitiesofbreed –etc.Ahandwritten Fieldwork/ProjectworkReport tobesubmitted inthegivenformat.
3. Max marksforFieldwork/Project workReport:05.
4. SuggestedFormatforFieldwork/ProjectworkReport:*Titlepage,student details,index page,detailsofplacevisited,observations made, findingsandacknowledgements.*
5. (IE)Unittests.

b) SuggestedCo-CurricularActivities

1. Sketchmodel dairyhousewith details
2. WebresourcesonProtocolsinthemanagementofstagesofcattle
3. Propertiesofvarietiesofmilkfromthemarketobservation
4. Assignment,Seminar,invitedlecture,Groupdiscussion.Quiz,CollectionofMaterial,Videoprepar ationetc.

B.Sc (Honours) with Single Major

Semester	Major* (4 Cr)			Minor (4 Cr)			AECC (3 Cr)			Multi Disny' (2 Cr)			Skill Enhancement Courses (2Cr)			OOTC			Env. Edn (2 Cr)			Total		
	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr
Sem 1	2*	10	8				2	8	6	1	2	2	2	4	4							7	24	20
Sem 2	2	6+4	8	1	3+2	4	2	8	6				2	4	4							7	27	22
Community Service Project of 180 hours with 4 Credits. Student is eligible for Exit Option-1 with the award of Certificate in respective discipline																								
Sem 3	4	12+8	16	1	3+2	4				1	2	2	1	2	2							7	29	24
Sem 4	3	9+6	12	2	6+4	8				1	2	2	1	2	2							7	29	24
Short-Term Internship/Apprenticeship/OJT of 180 hours with 4 Credits. Student is eligible for Exit Option-2 with the award of Diploma in respective major with minor																								
Sem 5	4	12+8	16	2	6+4	8													1	2	2	7	32	26
Sem 6	Semester Internship/Apprenticeship/OJT with 12 Credits. Student is eligible for Exit Option-3 with the award of Degree in respective major																							
																				IKS#				
Sem 7	3	9+6	12										2*	6+4	8	1	2	2	1	2	0	6	29	22
Sem 8	3	9+6	12										2*	6+4	8	1	2	2	1	2	0	6	29	22
	21		84	6		24	4		12	3	6	6	10	32	28	2	4	4	2	4	0	47		160

20 Additional Credits for 10 month mandatory Internship/OJT/Apprenticeship

C Courses **H** Hours **Cr** Credits **OOTC** Open Online Transdisciplinary

IKS# Indian Knowledge Systems - Audit Course

B.A/B.Com/BBA (Honours) with Minor

Semester	Major* (4 Cr)			Minor (4 Cr)			Languages (3 Cr)			Multi Disny' (2 Cr)			Skill Enhancement Courses (2Cr)			OOTC			Env. Edn (2 Cr)			Total		
	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr	C	H	Cr
Sem 1*	2	8	8				2	8	6	1	2	2	2	4	4							7	22	20
Sem 2	2	8	8	1	4	4	2	8	6				2	4	4							7	24	22
Community Service Project of 180 hours with 4 Credits.																								
Sem 3	4	16	16	1	4	4				1	2	2	1	2	2							7	24	24
Sem 4	3	12	12	2	8	8				1	2	2	1	2	2							7	24	24
Short-Term Internship/Apprenticeship/OJT of 180 hours with 4 Credits.																								
Sem 5	4	16	16	2	8	8													1	2	2	7	26	26
Sem 6	Semester Internship/Apprenticeship/OJT with 12 Credits.																							
																				IKS#				
Sem 7	3	12	12										2*	8	8	1	2	2	1	2	0	6	24	22
Sem 8	3	12	12										2*	8	8	1	2	2	1	2	0	6	24	22
	21		84	6		24	4		12	3	6	6	10	32	28	2	4	4	2	4	0	47		160

20 Additional Credits for 10 month mandatory Internship/OJT/Apprenticeship

C Courses **H** Hours **Cr** Credits **OOTC** Open Online Transdisciplinary

IKS# Indian Knowledge Systems - Audit Course

For Detailed Curriculum & Syllabus visit
www.apsche.ap.gov.in

DOCUMENT 4- EXAMINATION TIME TABLE

SEMESTER EXAMINATION TIME TABLE 2024

ST.ANN'S COLLEGE FOR WOMEN, MALKAPURAM, VSP - 11. (AUTONOMOUS)	
FIRST SEMESTER EXAMINATION DECEMBER - 2024	
TIMINGS : (9.00 AM TO 12.00 NOON)	
DATE	**SUBJECT**
02-12-2024	**GENERAL ENGLISH**
03-12-2024	**SECOND LANGUAGE**
04-12-2024	**SKILL DEVELOPMENT-1**COMMUNICATION SKILLS
05-12-2024	**SKILL DEVELOPMENT-2*LEADERSHIP* SKILLS** *(BA, BCOM, BCA, BBA,BOTANY,ZOOLOGY & MICROBIOLOGY)* ***ANALYTICAL SKILLS****(MATHS, PHYSICS, CHEMISTRY & COMPUTER SCIENCE)*
06-12-2024	**MULTIDISCIPLINARY COURSE** **PRINCIPLES OF BIOLOGICAL SCIENCES** *(BA, BCOM, BBA &BCA)* **INDIAN HISTORY** *(BOTANY,ZOOLOGY & MICROBIOLOGY)* **INTRODUCTION TO SOCIAL WORK** *((MATHS, PHYSICS, CHEMISTRY & COMPUTER SCIENCE)*
07-12-2024	**PAPER - I Essentials and Applications of Mathematical, Physical and Chemical Sciences**(MATHS, PHYSICS, CHEMISTRY & COMPUTER SCIENCE) **FUNDAMENTALS OF SOCIAL SCIENCES**(BA) **FUNDAMENTALS OF COMMERCE** (BCOM, BBA & BCA) **INTRODUCTION TO CLASSICAL BIOLOGY** (BOTANY, ZOOLOGY & MICROBIOLOGY)

09-12-2024	**PAPER - II Advances in Mathematical, Physical and Chemical Sciences**(MATHS, PHYSICS, CHEMISTRY & COMPUTER SCIENCE) **PERSPECTIVES ON INDIAN SOCIETY** (BA) **BUSINESS ORGANISATION** (BCOM, BBA & BCA) **INTRODUCTION TO APPLIED BIOLOGY** (BOTANY, ZOOLOGY & MICROBIOLOGY)

SEMESTER EXAMINATION TIME TABLE BBA 1-1

ANDHRA UNIVERSITY

B.B.A HONOURS, DIGITAL MARKETING & BUSINESS ANALYTICALS

II SEMESTER

(Regular Candidates Examinations)

(w.e.f.2023-2024 Admitted bath)

JULY/AUGUST -2024

TIME - TABLE

Date, Day & Time	Subject	Paper Code	Max Marks
29-07-2024 (Monday) 2.00 pm to 5.00 pm	*GENERAL ENGLISH – I* (w.e.f.2023-2024 Admitted Batch) **A Course in Reading & Writing Skills** (Common with B.A. B.Sc. B.Com, B.A.(O.L) B.B.A, B.C.A, and BHM&CT)	BA-HS 1201	75
30-07-2024 (Tuesday) 2.00 pm to 5.00 pm	*GENERAL TELULGU* , HINDI, SANSKRIT,URUDU AND TAMIL (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BA-HS 1202 BA-HS 1203 BA-HS 1204 BA-HS 1205	75
31-07-2024 (Wednesday) 2.00 pm to 3.30 pm	*SKILL COURSE* **Business Writing** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BA-HS 1230	50
01-08-2024 (Thursday) 2.00 pm to 3.30 pm	*SKILL COURSE* **Marketing Skills** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BA-HS 1231	50
02-08-2024 (Friday) 2.00 pm to 3.30 pm	*SKILL COURSE* **Investment Planning** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BA-HS 1232	50
03-08-2024 (Saturday) 2.00 pm to 3.30 pm	*SKILL COURSE* **Stock Market Operations** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BA-HS 1233	50
05-08-2024 (Monday) 2.00 pm to 3.30 pm	*SKILL COURSE* **Digital Literacy** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BA-HS 1234	50

Contd ..

Date and Day	MAJOR -I SUBJECT AND TITLES	Paper Code	Max Marks
06-08-2024 (Tuesday) 2.00 pm to 5.00 pm	*MAJOR SUBJECT: BBA HONOURS* **1) Principal of Management** (w.e.f.2023-2024 Admitted Batch)	BBA-HS 1201	70
	MAJOR SUBJECT: DIGITAL MANAGEMENT **1)Fundamental of Digital Marketing** (w.e.f.2023-2024 Admitted Batch)	BBA-HS 1203	70
	MAJOR SUBJECT: BUSINESS ANALYTICALS **1) Stastical Methods** (w.e.f.2023-2024 Admitted Batch)	BBA-HS 1205	70
	MAJOR-II SUBJECT AND TITLES		
07-08-2024 (Wednesday) 2.00 pm to 5.00 pm	*MAJOR SUBJECT: BBA HONOURS* **2) Business Economics** (w.e.f.2023-2024 Admitted Batch)	BBA-HS-1202	70
	MAJOR SUBJECT: BBA DIGITAL MARKETING **2) E-Marketing** (w.e.f.2023-2024 Admitted Batch)	BBA-HS-1204	70
	MAJOR SUBJECT: BBA BUSINESS ANLYTICALS **2) Introduction to Business Analytics** (w.e.f.2023-2024 Admitted Batch)	BBA-HS-1206	70
08-08-2024 (Thursday) 2.00 pm to 5.00 pm	*MINOR SUBJECT* : **PHILOSOPHY** **Indian Philosophy** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, B.A.(O.L) and BHM&CT)	BA-HS-N 201	70
	MINOR SUBJECT : **PUBLIC ADMINISTRATION** **Introduction to Public Administration** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, B.A.(O.L) and BHM&CT)	BA-HS-N 202	70
	MINOR SUBJECT : **POLITICAL SCIENCE** **Fundamentals of Political Science** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, B.A.(O.L) and BHM&CT)	BA-HS-N 203	70
	MINOR SUBJECT : **HISTORY** **Science and Human Past** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, B.A.(O.L) and BHM&CT)	BA-HS-N 204	70
	MINOR SUBJECT : **ECONOMICS** **Microeconomics** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, B.A.(O.L) and BHM&CT)	BA-HS-N 205	70

Contd ....

08-08-2024 (Thursday) 2.00 pm to 5.00 pm	*MINOR SUBJECT* : DAIRY SCIENCE **Breeds and breeding of dairy cattle and buffaloes - (T)** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BS-HS-N 239	70
	MINOR SUBJECT : FORESTRY **Introduction to forestry** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BS-HS-N 240	70
	MINOR SUBJECT : B.Voc.Dairying and Animal Husbandry **Livestock production and Management** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BS-HS-N 241	75
	MINOR SUBJECT : B.Voc.Agriculture **Fundamentals of Genetics** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BS-HS-N 242	75
	MINOR SUBJECT: TAXATION **Indian Tax System** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BC-HS-N 201	70
	MINOR SUBJECT : FINANCIAL MANAGEMENT **Fundamentals of Financial Management (w.e.f.2023-2024 Admitted Batch)** (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BC-HS-N 202	70
	MINOR SUBJECT : MARKETING **Fundamentals of Marketing** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BC-HS-N 203	70
	MINOR SUBJECT : ACCOUNTING **(for Non Commerce Majors) Financial Accounting** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BC-HS-N 204	70
	MINOR SUBJECT : COMMERCE **(for Non Commerce Majors) Business Management,**(w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	BC-HS-N 205	70
	MINOR SUBJECT : FINANCE **(For Commerce and Other Majors) Financial Services** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BC-HS-N 206	70

Contd ....

08-08-2024 (Thursday) 2.00 pm to 5.00 pm	*MINOR SUBJECT* : BIO INFORMATICS **Cell Biology and Microbiology** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	BS-HS-N 217	70
	MINOR SUBJECT : ANIMATION **Basic Drawing** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BS-HS-N 218	70
	MINOR SUBJECT : MULTIMEDIA **Graphic Design** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BS-HS-N 219	70
	MINOR SUBJECT : HOME SCIENCE **Essentials of Home Science Extension** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BS-HS-N 220	70
	MINOR SUBJECT : GEOLOGY **Geology and Branches of Geology** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BS-HS-N 221	70
	MINOR SUBJECT : FORENSIC SCIENCE **Forensic Science and Criminology** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BS-HS-N 222	70
	MINOR SUBJECT : CYBER FORENSIC **Fundamentals of Computer** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BS-HS-N 223	70
	MINOR SUBJECT : SERICULTURE **Biology And Physiology Of Mulberry** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BS-HS-N 234	70
	MINOR SUBJECT : INTERNET OF THINGS **Digital Electronics** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BS-HS-N 235	70
	MINOR SUBJECT : CEMENT SCIENCE **Geology and Mining of Limestone** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BS-HS-N 236	70
	MINOR SUBJECT : ORGANIC CHEMISTRY **Fundamentals in Organic Chemistry** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BS-HS-N 237	70
	MINOR SUBJECT : APPLIED MATHEMATICS **Differential Equations** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BS-HS-N 238	70

Contd ....

08-08-2024 (Thursday) 2.00 pm to 5.00 pm	*MINOR SUBJECT* : BIOTECHNOLOGY **Biomolecules and Analytical Techniques** – (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	BS-HS-N 207	70
	MINOR SUBJECT : CHEMISTRY **General & Inorganic Chemistry** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	BS-HS-N 208	70
	MINOR SUBJECT : BOTANY **Non-vascular Plants** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	BS-HS-N 209	70
	MINOR SUBJECT : BIO-CHEMISTRY **Biomolecules** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	BS-HS-N 210	70
	MINOR SUBJECT : STATISTICS **Descriptive Statistics** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	BS-HS-N 211	70
	MINOR SUBJECT : MATHEMATICS **Differential Equations & Problem Solving Sessions** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	BS-HS-N 212	70
	MINOR SUBJECT : HUMAN GENETICS **Principles of Genetics** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	BS-HS-N 213	70
	MINOR SUBJECT : FOOD SCIENCE AND NUTRITION **Food Science** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	BS-HS-N 214	70
	MINOR SUBJECT : DATA SCIENCE **Introduction to Data Science and R Programming** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	BS-HS-N 215	70
	MINOR SUBJECT : INFORMATION TECHNOLOGY **Problem Solving in C** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	BS-HS-N 216	70

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08-08-2024 (Thursday) 2.00 pm to 5.00 pm	*MINOR SUBJECT* : **URDU** **Urdu Zaban O Adab ki Tareekh** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	**BA-HS-N 216**	**70**
	MINOR SUBJECT : **MUSIC** **Basic Exercise of South Indian Classical Music & Sankeerthana** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	**BA-HS-N 217**	**70**
	MINOR SUBJECT : **DESIGN THINKING** **Introduction to design thinking** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	**BA-HS-N 218**	**70**
	MINOR SUBJECT : **FILM STUDIES** **Design Principle** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	**BA-HS-N 219**	**70**
	MINOR SUBJECT : **PSYCHOLOGY** **FOUNDATIONS OF PSYCHOLOGY** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	**BA-HS-N 220**	**70**
	MINOR SUBJECT : **FOOD SCIENCE AND TECHNOLOGY** **Food Biochemistry** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	**BS-HS-N 201**	**70**
	MINOR SUBJECT : **COMPUTER SCIENCE** **Problem Solving using C** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	**BS-HS-N 202**	**70**
	MINOR SUBJECT : **PHYSICS** **Mechanics and Properties of Matter** (w.e.f.2023-2024 Admitted Batch) ((Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	**BS-HS-N 203**	**70**
	MINOR SUBJECT : **ELECTRONICS** **Fundamental of Electricity and Electronics** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	**BS-HS-N 204**	**70**
	MINOR SUBJECT : **ZOOLOGY** **Animal Diversity-I Biology of Non-Chordates** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	**BS-HS-N 205**	**70**
	MINOR SUBJECT : **MICROBIOLOGY** **Introduction to Microbiology** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.O.L.B.B.A, B.C.A, and BHM&CT)	**BS-HS-N 206**	**70**

Contd ....

Date and Day	MAJOR -I SUBJECT AND TITLES	Paper Code	Max Marks
06-08-2024 (Tuesday) 2.00 pm to 5.00 pm	*MAJOR SUBJECT: BBA HONOURS* **1) Principal of Management** (w.e.f.2023-2024 Admitted Batch)	BBA-HS 1201	70
	MAJOR SUBJECT: DIGITAL MANAGEMENT **1)Fundamental of Digital Marketing** (w.e.f.2023-2024 Admitted Batch)	BBA-HS 1203	70
	MAJOR SUBJECT: BUSINESS ANALYTICALS **1) Stastical Methods** (w.e.f.2023-2024 Admitted Batch)	BBA-HS 1205	70
	MAJOR-II SUBJECT AND TITLES		
07-08-2024 (Wednesday) 2.00 pm to 5.00 pm	*MAJOR SUBJECT: BBA HONOURS* **2) Business Economics** (w.e.f.2023-2024 Admitted Batch)	BBA-HS-1202	70
	MAJOR SUBJECT: BBA DIGITAL MARKETING **2) E-Marketing** (w.e.f.2023-2024 Admitted Batch)	BBA-HS-1204	70
	MAJOR SUBJECT: BBA BUSINESS ANLYTICALS **2) Introduction to Business Analytics** (w.e.f.2023-2024 Admitted Batch)	BBA-HS-1206	70
08-08-2024 (Thursday) 2.00 pm to 5.00 pm	*MINOR SUBJECT ;* **PHILOSOPHY** **Indian Philosophy** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, B.A.(O.L) and BHM&CT)	BA-HS-N 201	70
	MINOR SUBJECT ; **PUBLIC ADMINISTRATION** **Introduction to Public Administration** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, B.A.(O.L) and BHM&CT)	BA-HS-N 202	70
	MINOR SUBJECT ; **POLITICAL SCIENCE** **Fundamentals of Political Science** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, B.A.(O.L) and BHM&CT)	BA-HS-N 203	70
	MINOR SUBJECT ; **HISTORY** **Science and Human Past** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, B.A.(O.L) and BHM&CT)	BA-HS-N 204	70
	MINOR SUBJECT ; **ECONOMICS** **Microeconomics** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, B.A.(O.L) and BHM&CT)	BA-HS-N 205	70

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ANDHRA UNIVERSITY

B.B.A HONOURS, DIGITAL MARKETING & BUSINESS ANALYTICALS

II SEMESTER

(Regular Candidates Examinations)

(w.e.f.2023-2024 Admitted bath)

JULY/AUGUST -2024

TIME - TABLE

Date, Day & Time	Subject	Paper Code	Max Marks
29-07-2024 (Monday) 2.00 pm to 5.00 pm	*GENERAL ENGLISH – I* (w.e.f.2023-2024 Admitted Batch) **A Course in Reading & Writing Skills** (Common with B.A. B.Sc. B.Com, B.A.(O.L) B.B.A, B.C.A, and BHM&CT)	BA-HS 1201	75
30-07-2024 (Tuesday) 2.00 pm to 5.00 pm	*GENERAL TELULGU*, HINDI, SANSKRIT,URUDU AND TAMIL (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BA-HS 1202 BA-HS 1203 BA-HS 1204 BA-HS 1205	75
31-07-2024 (Wednesday) 2.00 pm to 3.30 pm	*SKILL COURSE* **Business Writing** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BA-HS 1230	50
01-08-2024 (Thursday) 2.00 pm to 3.30 pm	*SKILL COURSE* **Marketing Skills** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BA-HS 1231	50
02-08-2024 (Friday) 2.00 pm to 3.30 pm	*SKILL COURSE* **Investment Planning** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BA-HS 1232	50
03-08-2024 (Saturday) 2.00 pm to 3.30 pm	*SKILL COURSE* **Stock Market Operations** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BA-HS 1233	50
05-08-2024 (Monday) 2.00 pm to 3.30 pm	*SKILL COURSE* **Digital Literacy** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BA-HS 1234	50

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08-08-2024 (Thursday) 2.00 pm to 5.00 pm	*MINOR SUBJECT* : INSURANCE MANAGEMENT **Principles and Practice of Life Insurance** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BC-HS-N 207	70
	MINOR SUBJECT : BUSINESS MANAGEMENT **Principles of Management** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BBA-HS-N 201	70
	MINOR SUBJECT : DIGITAL MARKETING **Fundamentals of Digital Marketing** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BBA-HS-N 202	70
	MINOR SUBJECT : LOGISTICS AND SUPPLY CHAIN MANAGEMENT **Logistics Concepts and Planning** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BBA-HS-N 203	70
	MINOR SUBJECT : RETAIL MANAGEMENT **Foundations of Retail Management** (w.e.f.2023-2024 Admitted Batch)(Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	BBA-HS-N 204	70
	MINOR SUBJECT : COMPUTER APPLICATIONS **Office Automation Tools** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BCA-HS-N 201	70
	MINOR SUBJECT : CLOUD COMPUTING **Computer Networks** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BCA-HS-N 202	70
	MINOR SUBJECT : HOTEL MANAGEMENT **Introduction to F&B service-2** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.A.(O.L)B.B.A, B.C.A, and BHM&CT)	BHM-HS-N 201	70

(BY ORDER)

C.A.O, A.U, V.S.P
Date:

CONTROLLER OF EXAMINATIONS

SEMESTER EXAMINATION B.COM COMPUTER APPLICATIONS 1-2

ANDHRA UNIVERSITY

B. VOCATIONAL COURSE- DAIRYING & ANIMAL HUSBANDRY
SECOND SEMESTER (w.e.f. 2023-2024)
DEGREE EXAMINATIONS : JULY 2024
(REGULAR)
TIME - TABLE

Date, Day & Time	Paper Code	SUBJECT	Max Marks
Monday 29th July 2024 2 PM to 5 PM	BA-HS 1201	Part-I GENERAL ENGLISH – I A Course in Reading and Writing Skills (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	75
Tuesday 30th July 2024 2 PM to 5 PM	BA-HS 1202	Part-I GENERAL TELUGU Sujanaranjaka Rachana (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	75
	BA-HS -1203	Part-I: GENERAL HINDI HINDIKATHA SAHITYA (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	75
	BA-HS 1204	GENERAL SANSKRIT Poetry, Prose & Grammar-II (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	75
	BA-HS 1205	GENERAL URDU Urdu Prose Non Fiction (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	75
Wednesday 31st July 2024 2 PM to 3.30 PM	BA-HS 1230	SKILL COURSE Business Writing (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	50
Thursday 1st August 2024 2 PM to 3.30 PM	BA-HS 1231	SKILL COURSE Marketing Skills (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	50
Friday 2nd August 2024 2 PM to 3.30 PM	BA-HS 1232	SKILL COURSE Investment Planning (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	50
Saturday 3rd August 2024 2 PM to 3.30 PM	BA-HS 1233	SKILL COURSE Stock Market Operations (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	50
Monday 5th August 2024 2 PM to 3.30 PM	BA-HS 1234	SKILL COURSE Digital Literacy (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	50

Tuesday 6th August 2024 2 PM to 3.30 PM	BS-HS-1261	Skill Enhancement B. VOCATIONAL AGRICULTURE (Major) Fruits and Vegetable Preservation (w.e.f.2023-2024 Admitted Batch)	50
Wednesday 7th August 2024 2 PM to 3.30 PM	BS-HS-1262	Skill Enhancement B. VOCATIONAL AGRICULTURE (Major) Agriculture Marketing (w.e.f.2023-2024 Admitted Batch)	50
Friday 9th August 2024 2 PM to 5 PM	BS-HS-1263	B. VOCATIONAL AGRICULTURE (Major) Principles of Agronomy (w.e.f.2023-2024 Admitted Batch)	75
Monday 12th August 2024 2 PM to 5 PM	BS-HS-1264	B. VOCATIONAL AGRICULTURE (Major) Introduction to Soil Science (w.e.f.2023-2024 Admitted Batch)	75

(BY ORDER)

C.A.O.,A.U. V.S.P
Date : 18- 07- 2024

(T. CHITTI BABU)
CONTROLLER OF EXAMINATION

ANDHRA UNIVERSITY

B. VOCATIONAL COURSE- AGRICULTURE (CBCS)

SECOND SEMESTER

(w.e.f. 2023-2024)

DEGREE EXAMINATIONS : JULY 2024

(REGULAR)

TIME - TABLE

Date, Day & Time Hours	Paper Code	SUBJECT	Max Marks
Monday 29th July 2024 2 PM to 5 PM	BA-HS 1201	Part-I *GENERAL ENGLISH – I* **A Course in Reading and Writing Skills** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	75
Tuesday 30th July2024 2 PM to 5 PM	BA-HS 1202	Part-I *GENERAL TELULGU* **Srujanaatmaka Rachana** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	75
	BA-HS -1203	Part-I: *GENERAL HINDI* **HINDIKATHA SAHITYA** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	75
	BA-HS 1204	*GENERAL SANSKRIT* **Poetry, Prose & Grammer-II** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	75
	BA-HS 1205	*GENERAL URDU* **Urdu Prose Non Fiction** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	75
Wednesday 31st July 2024 2 PM to 3.30 PM	BA-HS 1230	*SKILL COURSE* **Business Writing** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	50
Thursday 1st August 2024 2 PM to 3.30 PM	BA-HS 1231	*SKILL COURSE* **Marketing Skills** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	50
Friday 2nd August 2024 2 PM to 3.30 PM	BA-HS 1232	SKILL COURSE **Investment Planning** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	50
Saturday 3rd August 2024 2 PM to 3.30 PM	BA-HS 1233	SKILL COURSE **Stock Market Operations** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	50
Monday 5th August 2024 2 PM to 3.30 PM	BA-HS 1234	SKILL COURSE **Digital Literacy** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	50

Wednesday, 7th August 2024 2 PM to 5 PM	BS-HS 1236	HUMAN GENETICS (Major) Human Genetics and Cytogenetics (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1238	GEOGRAPHY (Major) Human Geography (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1240	ANIMATION (Major) Graphic Design (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1242	BIO-INFORMATICS (Major) Biomolecules (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1244	FOOD SCIENCE AND NUTRITION (Major) Food Chemistry (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1246	AGRICULTURE (Major) Fundamental of Agriculture Economics (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1248	INFORMATION TECHN OLOGY (Major) Mathematics for Computer Science – (T) (w.e.f.2023-2024 Admitted Batch)	70

(BY ORDER)

C.A.O., A.U. V.S.P.
Date : 16-07-2024

(T. CHITTI BABU)
CONTROLLER OF EXAMINATION

Wednesday, 7th August 2024 2 PM to 5 PM	BS-HS 1202	ARTIFICIAL INTELLIGENCE (MAJOR) Statistical Methods and Probability Distribution (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1204	DATA SCIENCE (MAJOR) Descriptive Statistics (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1206	MATHEMATICS (Major) Analytical Solid Geometry & Problem Solving Sessions (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1208	HOME SCIENCE (MAJOR) Human Development (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1210	FOOD SCIENCE & TECHNOLOGY (MAJOR) Human Nutrition (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1212	GEOLOGY (MAJOR) Physical Geology and soil Science (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1214	FISHERIES SCIENCE Courses with AQUACULTURE (MAJOR) Course : 3 Biology of fin Fish & Shellfish (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1216	COMPUTER SCIENCE (MAJOR) Digital Logic Design (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1218	PHYSICS (MAJOR) Waves and Oscillations (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1220	ELECTRONICS (MAJOR) Circuit theory and electronics devices (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1222	ZOOLOGY (Major) Cell and Molecular Biology (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1224	MICROBIOLOGY (MAJOR) Bacteriology and Biology (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1226	BIO-TECHNOLOGY (MAJOR) Microbiology Cell Biology (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1228	CHEMISTRY (MAJOR) Inorganic Chemistry (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1230	BOTANY (Major) Origin of Life and Diversity of Microbes (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1232	BIO-CHEMISTRY (Major) Cell Biology (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1234	STATISTICS (Major) Random Variables & Mathematical Expectations (w.e.f.2023-2024 Admitted Batch)	70

Tuesday, 6th August 2024 2 PM to 5 PM	BS-HS 1223	**MICROBIOLOGY (Major)** **Introduction to Microbiology** (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1225	**BIO-TECHNOLOGY (Major)** Biomolecules and Analytical Techniques (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1227	**CHEMISTRY (Major)** **General & Inorganic Chemistry** (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1229	**BOTANY (Major)** **Non-Vascular Plants** (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1231	**BIO-CHEMISTRY (Major)** **Biomolecules** (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1233	**STATISTICS (Major)** **Descriptive Statistics** (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1235	**HUMAN GENETICS (Major)** **Principles of Genetics** (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1237	**GEOGRAPHY (Major)** Physical Geography -I (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1239	**ANIMATION(Major)** **Basic Drawing** (w.e.f.2023-2024 Admitted Batch)	70
	BS-S1241	**BIO-INFORMATICS (Major)** **Cell Biology and Microbiology** (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1243	**FOOD SCIENCE AND NUTRITION (Major)** **Food Science** (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1245	**AGRICULTURE (Major)** **Fundamentals of Agronomy Course** (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1247	**INFORMATION TECHN OLOGY (Major)** **Problem Solving in C –(T)** (w.e.f.2023-2024 Admitted Batch)	70
	BCA-HS-1201	**MAJOR SUBJECTS** B. Vocational (Computer Applications) Office Automation Tools (w.e.f. 2023 – 2024 Admitted Batch) Common with B.Com., B. Voc. (Computer Applications) and B.C.A	70

Thursday 1st August 2024 2 PM to 3.30 PM	BA-HS 1231	*SKILL COURSE* **Marketing Skills** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	50
Friday 2nd August 2024 2 PM to 3.30 PM	BA-HS 1232	**SKILL COURSE** **Investment Planning** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	50
Saturday 3rd August 2024 2 PM to 3.30 PM	BA-HS 1233	**SKILL COURSE** **Stock Market Operations** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	50
Monday 5th August 2024 2 PM to 3.30 PM	BA-HS 1234	**SKILL COURSE** **Digital Literacy** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	50
Tuesday, 6th August 2024 2 PM to 5 PM	BS-HS 1201	**ARTIFICIAL INTELLIGENCE (MAJOR)** **Python for Data Science** (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1203	**DATA SCIENCE (MAJOR)** Introduction to Data Science and R Programming (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1205	**MATHEMATICS (MAJOR)** **Differential Equations & Problem Solving Sessions** (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1207	**HOME SCIENCE (MAJOR)** Essentials of Home Science Extension (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1209	**FOOD SCIENCE & TECHNOLOGY (MAJOR)** **Food Biochemistry** (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1211	**GEOLOGY (MAJOR)** **Geology and Branches of Geology** (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1213	**FISHERIES SCIENCE Common with AQUACULTURE (MAJOR)** **Course : 3 Taxonomy and Functional Anatomy of Fin Fish and Shellfish** (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1215	**COMPUTER SCIENCE (MAJOR)** **Problem Solving Using C** (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1217	**PHYSICS (MAJOR)** **Mechanics and Properties of Matter** (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1219	**ELECTRONICS (MAJOR)** **Fundamental of electricity and Electronics** (w.e.f.2023-2024 Admitted Batch)	70
	BS-HS 1221	**ZOOLOGY (Major)** **Animal Diversity-I Biology of Non-Chordates** (w.e.f.2023-2024 Admitted Batch)	70

ANDHRA UNIVERSITY
ఆంధ్ర విశ్వవిద్యాలయం

B.Sc. HONOURS (MAJOR)

Degree Examinations – JULY/2024

w.e.f. 2023-2024 ADMITTED BATCH

SECOND SEMESTER

(REGULAR)

TIME - TABLE

Day, Date & Time Hours	Paper Code	SUBJECT	Max Marks
Monday 29th July 2024 2 PM to 5 PM	BA-HS 1201	Part-I *GENERAL ENGLISH – I* **A Course in Reading and Writing Skills** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	75
Tuesday 30th July 2024 2 PM to 5 PM	BA-HS 1202	Part-I *GENERAL TELULGU* **Srujanaatmaka Rachana** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	75
	BA-HS -1203	Part-I: *GENERAL HINDI* **HINDIKATHA SAHITYA** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	75
	BA-HS 1204	*GENERAL SANSKRIT* **Poetry, Prose & Grammer-II** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	75
	BA-HS 1205	*GENERAL URDU* **Urdu Prose Non Fiction** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	75
Wednesday 31st July 2024 2 PM to 3.30 PM	BA-HS 1230	*SKILL COURSE* **Business Writing** (w.e.f.2023-2024 Admitted Batch) (Common with B.A. B.Sc. B.Com, B.B.A, B.C.A, and BHM&CT)	50

Contd....Page No. 2

Tuesday 6th August 2024 2 PM to 3.30 PM	BS-HS-1266	Skill Enhancement B. VOCATIONAL Dairying & Animal Husbandry Pet and Zoo Animal Management (w.e.f 2023-2024 Admitted Batch)	50
Wednesday 7th August 2024 2 PM to 3.30 PM	BS-HS-1267	Skill Enhancement B. VOCATIONAL Dairying & Animal Husbandry Dairy farm general Management (w.e.f.2023-2024 Admitted Batch)	50
Friday 9th August 2024 2 PM to 5 PM	BS-HS-1268	B. VOCATIONAL Dairying & Animal Husbandry **Veterinary Anatomy (Major)** (w.e.f.2023-2024 Admitted Batch)	75
Monday 12th August 2024 2 PM to 5 PM	BS-HS-1269	B. VOCATIONAL Dairying & Animal Husbandry **Veterinary Physiology (Major)** (w.e.f.2023-2024 Admitted Batch)	75

(BY ORDER)

C.A.O., A.U.,
Visakhapatnam
Date :16-07-2024

(T. CHITTI BABU)
CONTROLLER OF EXAMINATION

SEMESTER EXAMINATION TIME TABLE BA 1-2 2024

ANDHRA UNIVERSITY

B.A. (CBCS) SEMESTER SYSTEM
w.e.f. 2015 TO 2019 (Admitted Batches)
I SEMESTER SUPPLEMENTARY CANDIDATES
JULY - 2024

Day, Date & Hours	Paper Code	Subjects	Max.Marks
29-07-2024 Monday 9.00 am to 12.00 Noon	BA-S 1101	Paper-I **English** -(Common with B.A,B.Com,B.Sc, B.B.A,B.C.A&BHMBCT) (w.e.f.2015-16 admitted batch)	75
	BA-S 1134	Paper-I **General English** - (w.e.f.2016-17 Admitted batch) (Common paper)	75
30-07-2024 Tuesday 9.00 am to 12.00 Noon	BA-S 1102	Paper-I **Telugu** or any other classical or Modern Indian languages (Common paper) (w.e.f.2015-16 admitted batch)	75
	BA-S 1136	Paper-I **General Telugu** or any other classical or Modern Indian languages (Common Paper) (w.e.f.2016-17 admitted batch)	75
31-07-2024 Wednesday 9.00 am to 11.00 a.m	BA-S 1105	**PART- III** Paper-I **Foundation course** - (Human values Professional Ethics) **(Common paper) (W.e.f.2015-16&2016-17 A.B)**	50
01-08-2024 Thursday 9.00 am to 11.00 am	BA-S 1106	Paper-I **Skill Development** -1 - (Communication and soft skills-I) (Common paper) (W.e.f.2015-16 admitted batch)	50
	BA-S 1142	Paper-I **Foundation Course–2** - (Environmental Studies) (Common Paper) (W.e.f.2016-17 admitted batch)	50
02-08-2024 Friday 9.00 am to 12.00 Noon	BA-S 1110	**PART – II** Paper –I **History** - (Indian History and Culture from earliest times to 647 AD) (W.e.f.2015-16 admitted batch only)	75
	BA-S 1139	Paper –I **History** - (Ancient Indian history & culture from earliest times to 600 AD) (W.e.f.2016-17 admitted batch)	75
	BA-S 1118	Paper - I **Psychology** - (General psychology) (w.e.f. 2015-2016 & 2016-2017)	75
03-08-2024 Saturday 9.00 am to 12.00 Noon	-----	**Philosophy** - (Indian Philosophy) (w.e.f. 2015-2016 & 2016-2017 admitted batches)	75
	BA-S 1117	Paper-I **Social work** (w.e.f. 2015-2016 & 2016-2017A.B) (Social work profession philosophy & social science concepts)	75
	BA-S 1121	Paper -I **Rural Industrialization** (Problems & Perspectives of Rural industrialization) (w.e.f. 2015-2016 & 2016-2017 admitted batch)	75
	------	Paper - I **Rural Development** - (Elements of Rural Development) (w.e.f. 2015-2016 & 2016-2017 A.B)	75
	BA-S 1123	Paper-I **Tourism &Travel management** (w.e.f. 2015-2016 & 2016-2017 admitted batch)	75
	BA-S 1120	Paper-I **Music** - (w.e.f. 2015-2016 & 2016-2017 (A.B)	75
	BA-S 1128	Paper-1 **Dance** - (w.e.f. 2015-2016 & 2016-2017)	75

05-08-2024 Monday 9.00 am to 12.00 Noon	BA-S 1111 BS-S 1121	Paper-I **Economics** (Micro Economics) (Common with B.A&B.Sc.) (w.e.f. 2015-2016 admitted batch)	75
	BA-S 1138 BS-S 1136	Paper-I **Economics** (Micro Economics consumer behavior) (Common with B.A.& BSc.) (w.e.f. 2016-2017 admitted batch)	75
	BA-S 1144	Paper-I **Journalism and Mass Communication** (History of Journalism in India) (w.e.f. 2018-2019 Admitted Batch)	75
06-08-2024 Tuesday 9.00 am to 12.00 Noon	BA-S 1112	Paper-1 **Political science** - (Basic concepts of political science) (w.e.f. 2015-2016 admitted batch)	75
	BA-S 1140	Paper I - **Political science** (Basic concepts of political science) (w.e.f.2016-2017 admitted batch)	75
07-08-2024 Wednesday 9.00 am to 12.00 Noon	BA-S 1115	Paper-I **Special Telugu - (Poetry)** (w.e.f.2015-2016 admitted batch)	75
	BA-S 1137	**Special Telugu – (w.e.f. 2016-2017 admitted batch)** (An introduction to Telugu language and literature)	75
	BA-S 1126	Paper-I **Human Resource management** (w.e.f. 2015-2016 & 2016-2017 admitted batch)	75
	BA-S 1125 BS-S 1117	Paper-I **Geography** -(Geography of India) (w.e.f. 2015-2016 & 2016-2017A.B)	75
	BA-S 1116	Paper-I **Special English** (English Literature) (w.e.f.2015-2016 admitted batch)	75
	BA-S 1135	Paper-I **Special English- (w.e.f. 2016-2017 admitted batch)** (An Introduction to English language and literature)	75
	BA-S 1124	Paper -I **Education** (foundation of education) (w.e.f. 2015-2016 & 2016-2017 admitted batch)	75
08-08-2024 Thursday 9.00 am to 12.00 Noon	BA-S 1113	Paper-I **Public Administration** - (Principles of Public Administration) (w.e.f. 2015-2016 admitted batch)	75
	BA-S 1141	Paper-I **Public Administration** - (Theories of Public Administration) (w.e.f. 2016-2017 admitted batch)	75
	BA-S 1129	Paper -1 **Commerce** Business Organization Management (w.e.f. 2015-2016 & 2016-2017 A.B.)	75
	BA-S 1114	Paper – I **Sociology** - Basic concept of sociology (w.e.f. 2015-2016 & 2016-2017 admitted batch)	75

(BY ORDER)

CONTROLLER OF EXAMINATIONS

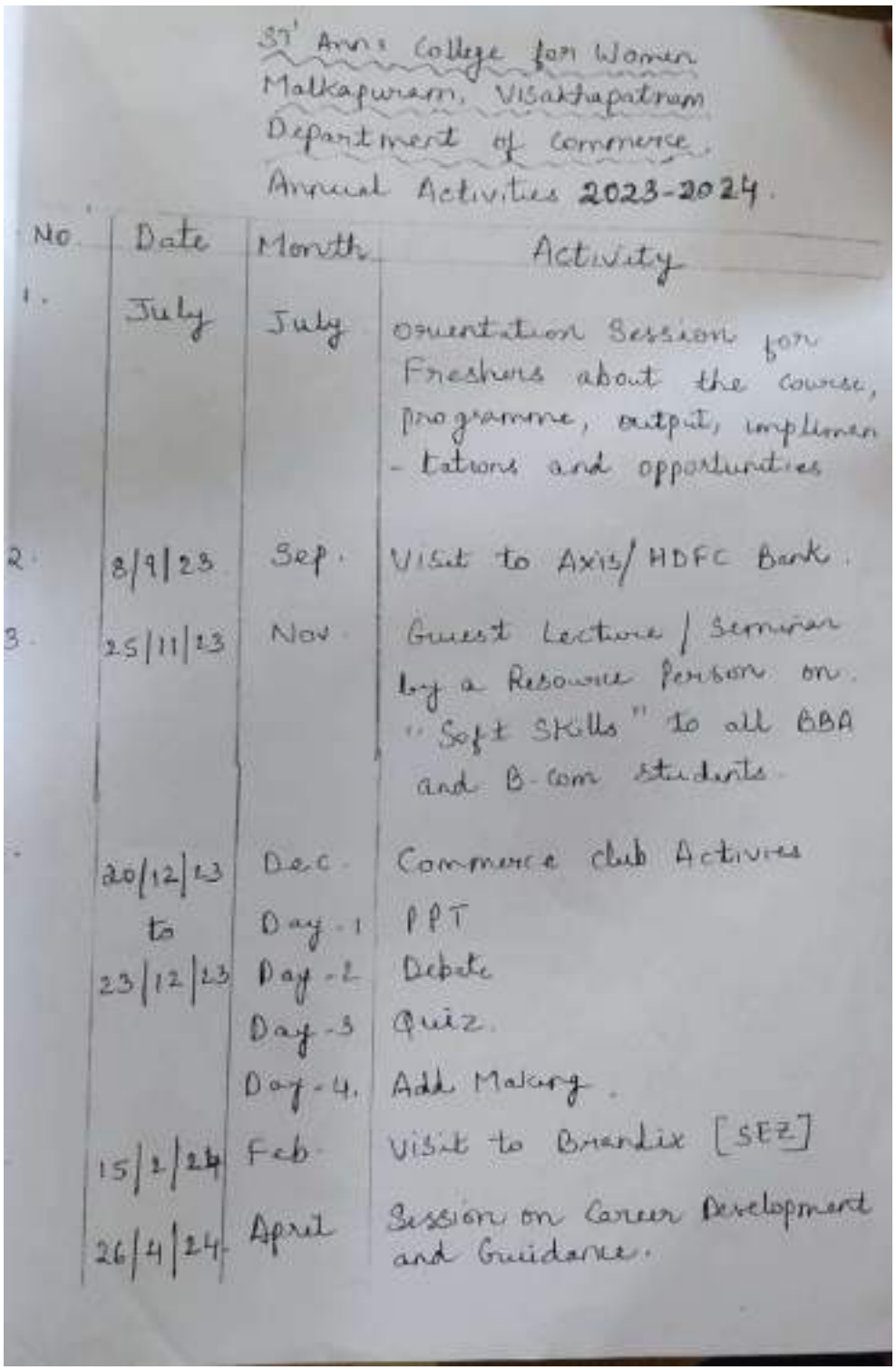
C.A.O; AU, VSP

Date: 16-07-2024

Controller of Examinations
Andhra University
Visakhapatnam

DOCUMENT 5
DEPARTMENTAL CALENDAR

COMMERCE DEPARTMENT 2023-2024



St' Ann's College for Women
Malkapuram, Visakhapatnam
Department of Commerce.
Annual Activities 2023-2024.

No.	Date	Month	Activity
1.	July	July	Orientation Session for Freshers about the course, programme, output, implementations and opportunities
2.	8/9/23	Sep.	Visit to Axis/HDFC Bank.
3.	25/11/23	Nov.	Guest Lecture / Seminar by a Resource Person on "Soft Skills" to all BBA and B.Com students.
.	20/12/23 to 23/12/23	Dec.	Commerce club Activities
		Day-1	PPT
		Day-2	Debate
		Day-3	Quiz.
		Day-4.	Add Making.
	15/2/24	Feb.	Visit to Brandix [SEZ]
	26/4/24	April	Session on Career Development and Guidance.

DEPARTMENT OF HISTORY ACCADEMIC CALENDAR 2023-2024

Department of History

Annual activities Diary

July 2024 - Feb 2025

1-8-2024 — Student Seminar on Pingali Venkaiah Indian Flag designer

14-8-2024 — Women Empowerment day in Collaboration with Dept of English

27-9-2024 — World Tourism day - Historical field visit

7-10-2024 — World Cotton Day

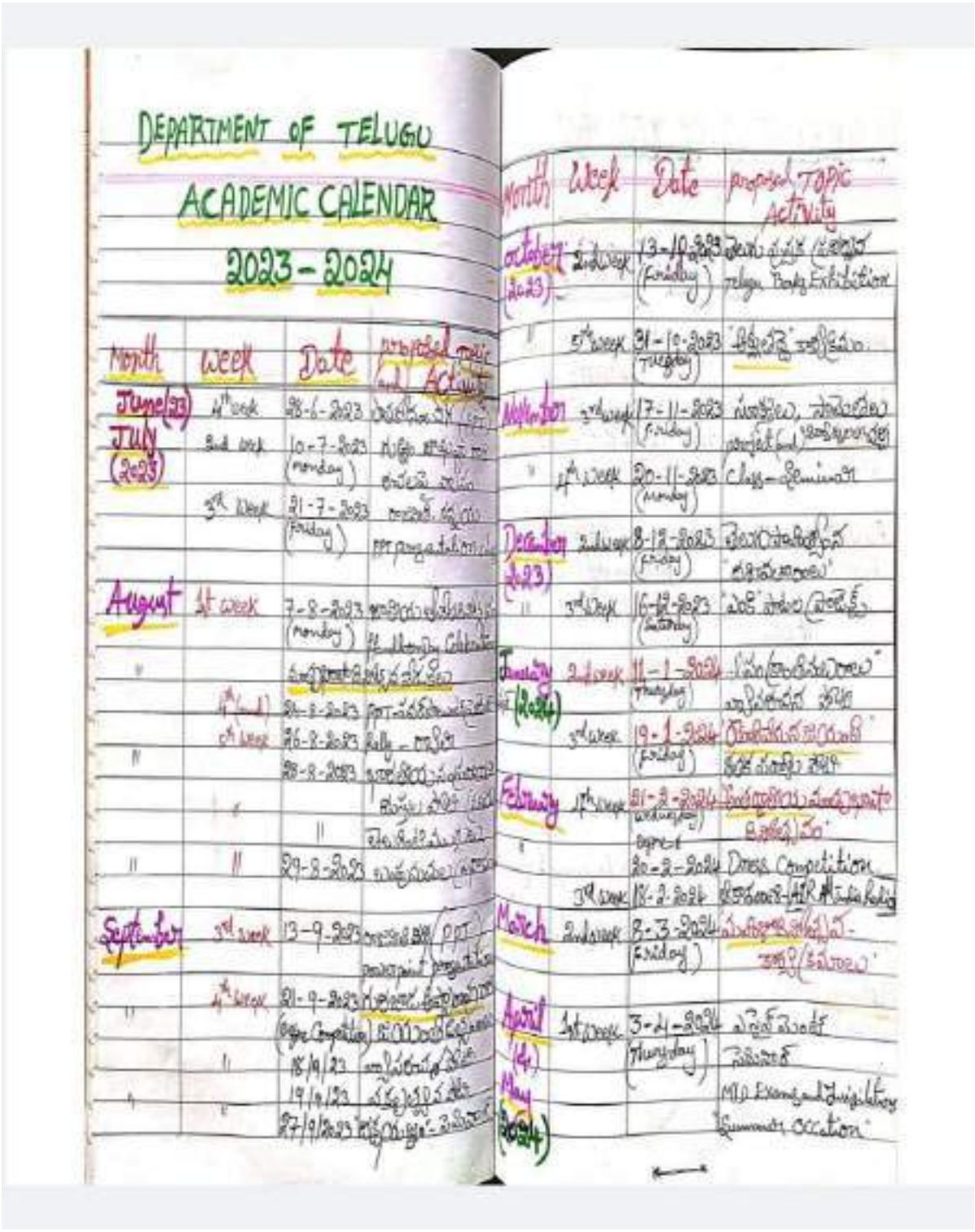
5.12.2024 — World Soil day in collaboration with Dept of Botany

9-1-2024 — Pravasi Bharatiya Divas Student talk on Gandhiji

30.1-2024 — Martyrs Day of Shaheed Divas

G. Lalitha
Dept of History

DEPARTMENT OF TELUGU ACCADEMIC CALENDAR 2023-2024



DEPARTMENT OF TELUGU

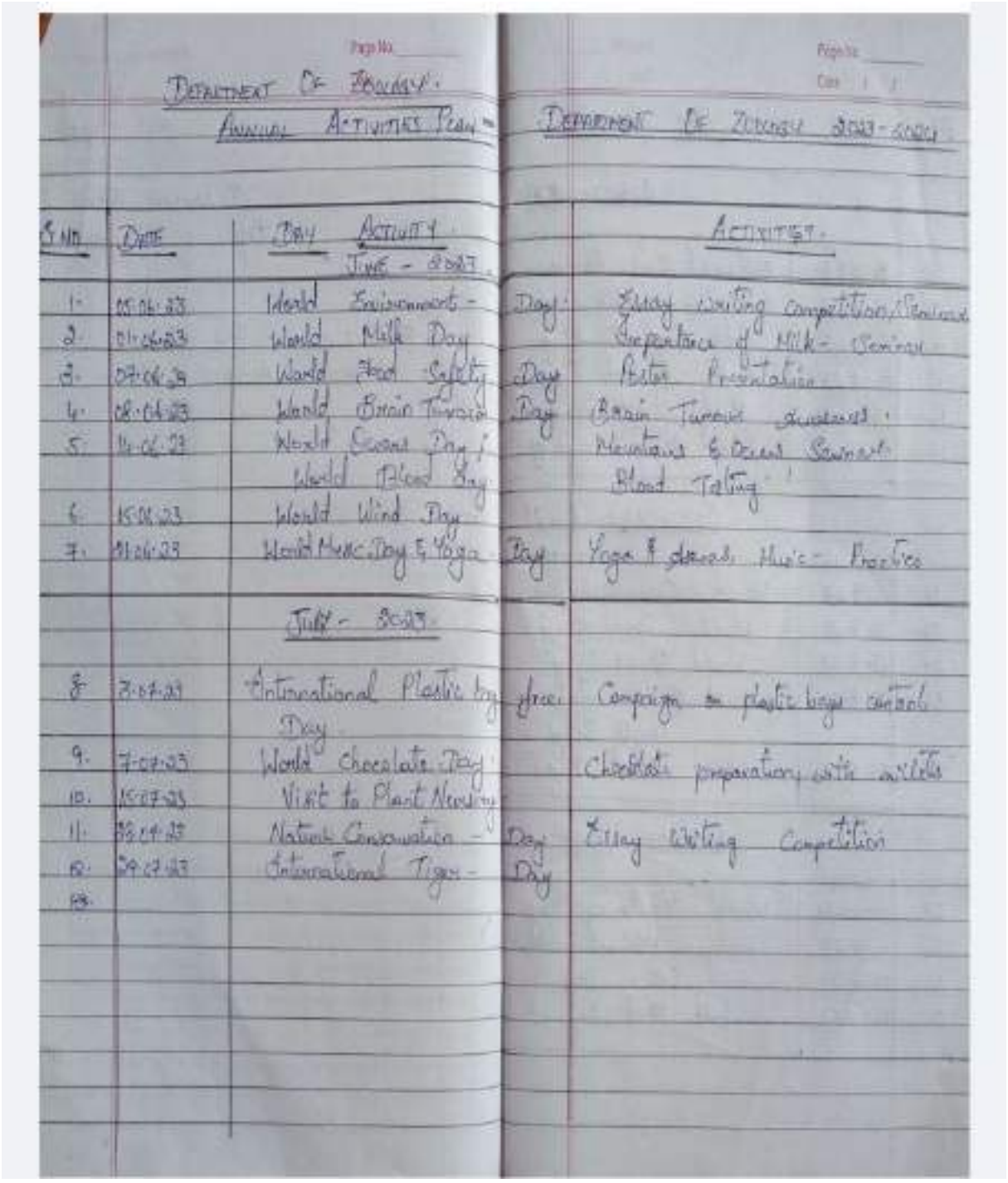
ACADEMIC CALENDAR

2023 - 2024

Month	Week	Date	proposed topic / Activity
June(23) JULY (2023)	4th week	28-6-2023	
	2nd week	10-7-2023 (monday)	
	3rd week	21-7-2023 (Friday)	
August	1st week	7-8-2023 (monday)	
	4th (last)	24-8-2023	
	5th week	26-8-2023	
		28-8-2023	
		29-8-2023	
September	3rd week	13-9-2023	
	4th week	21-9-2023	
		18/9/23	
		19/9/23	
		27/9/2023	

Month	Week	Date	proposed Topic Activity
October (2023)	2nd week	13-10-2023 (Friday)	Telugu Book Exhibition
	5th week	31-10-2023 (Tuesday)	
November	3rd week	17-11-2023 (Friday)	
	4th week	20-11-2023 (monday)	Class - Seminars
December (2023)	2nd week	8-12-2023 (Friday)	
	3rd week	16-12-2023 (Saturday)	
January (2024)	2nd week	11-1-2024 (Thursday)	
	3rd week	19-1-2024 (Friday)	
February	4th week	21-2-2024 (Wednesday)	
		20-2-2024	Dress Competition
	3rd week	18-2-2024	
March	2nd week	8-3-2024 (Friday)	
April (24) May (2024)	1st week	3-4-2024 (Thursday)	
			MID Exams and Summer Vacation

DEPARTMENT OF ZOOLOGY ACADEMIC CALENDAR 2023-2024



DEPARTMENT OF ZOOLOGY.

ANNUAL ACTIVITIES PLAN

S.NO	DATE	DAY	ACTIVITY
			JUNE - 2023
1.	05.06.23	World Environment -	Day: Essay writing competition, Seminar
2.	01.06.23	World Milk Day	Importance of Milk - Seminar
3.	07.06.23	World Food Safety	Day Poster Presentation
4.	08.06.23	World Brain Tumour	Day Brain Tumour awareness,
5.	14.06.23	World Ocean Day, World Blood Day	Mountains & Ocean Seminar. Blood Testing
6.	15.06.23	World Wind Day	
7.	21.06.23	World Music Day & Yoga	Day Yoga & classical Music - Practice
			JULY - 2023
8.	7.07.23	International Plastic bag Day	Green Campaign on plastic bags control
9.	7.07.23	World Chocolate Day	Chocolate preparation with wastes
10.	15.07.23	Visit to Plant Nursery	
11.	28.07.23	Nature Conservation -	Day Essay Writing Competition
12.	29.07.23	International Tiger -	Day
13.			

S.No.	DATE	DAY ACTIVITY	ACTIVITIES.
		AUGUST - 2023.	
13.	9.08.23	National Book lovers -	Day. Book exhibition.
14.	12.08.23	International Youth Day / World Elephant Day	Group discussion on the role of Youth - Conservation of Elephants. Seminar.
15.	10.08.23	World Biofuel Day.	Seminar on Biofuels.
16.	19.08.23	Field Visit to Kuk.	
17.	20.08.23	World Mosquito Day.	Control of mosquitoes by growing mosquito repellent plants.
		SEPTEMBER - 2023.	
18.	02.9.23	World Coconut Day	
19.	16.9.23	World Ozone day.	Seminars
20.	24.9.23	World River Day	Poster Presentation
21.	28.9.23	World Environmental - Health Day.	
22.	29.9.23	World Heart Day	
		OCTOBER - 2023.	
23.	01.10.23	World Vegetarian Day	
24.	04.10.23	World Animal Welfare Day	Seminars.
25.	07.10.23	World Cotton Day	
26.	16.10.23	World Food Day.	Food festival.

S.No	Date	Day Activity	Activities
		NOVEMBER - 2023.	
27.	07.11.23	National & World Cancer Awareness Day	Guest lecture
28.	08.11.23	International Day for preventing exploitation of Environment in War & Armed Conflicts	Seminar.
29.	10.11.23	World Science Day for Peace & Development	Skit & Role play.
30.	12.11.23	National Bird Day	Seminar
31.	21.11.23	World Fisheries Day	Visit to aquariums.
32.	26.11.23	National Milk Day	Seminars & Field Visit
		DECEMBER - 2023.	
33.	01.12.23	World aids Day	Rally, Poster presentation, Seminar.
34.	02.12.23	National Pollution Control Day	Seminar & Poster presentation
35.	05.12.23	World Soil Day	Filling growth Bags & Identification of soil.
36.	09.12.23	International Day Day.	Field visit.

DEPARTMENT OF MATHEMATICS ACCADEMIC CALENDAR 2023-2024

Activities Conducted in → 2023 - 24

S.NO.	Month	Name of the Activities	Title of Activities	Name of the Lecturers Involved		Remarks
1	September 16/9/23	chart presentation on i) Graphical representation of complex numbers and 3D-Geometry ii) Trigonometric ratio of angles representation (All [illegible] [illegible])	chart presentation •	G. Manjula (Lecturer in Mathematics) K. Suneetha (Lecturer in Mathematics)		
2	September 17/9/23	→ Seminar on Special Functions	• Seminar	→ K. Sunitha		
3	October 14/10/2023	project on Geometrical representation		→ G. Manjula K. Sunitha		
4	December 22/12/23	National Mathematics Day celebrations	• Mathematics Day	→ • G. Manjula Lecturer in Mathematics • K. Sunitha Lecturer in Mathematics • M. Arush Lecturer in statistics		
5	February 16/2/24	PPT presentation	• Digital [illegible]	• K. Sunitha G. Manjula		

DOCUMENT 6
INTERNAL ASSESSMENT
DEPARTMENT OF ARTS 1-2

ANDHRA UNIVERSITY

B A Honours- GRADING SYSTEM DEGREE EXAMINATION - JUNE-2024

AWARD LIST FOR INTERNAL ASSESSMENT

Centre Name : 341-ST.ANNs COLLEGE FOR WOMEN, MALKAPURAM,VISAKHAPATNAM

Subject : HISTORY : SCIENCE AND HUMAN PAST SEMESTER : 2 Max Marks : 30 M

S.No.	Regd.No.	Name	Marks Obtained	In Words
1	123134101008	RAJESHWARI A	29	Twenty-Nine
2	123134101009	SAGARA CHANDRAKALA	26	Twenty-Six
3	123134101010	VANJARI SWETHA KUMARI	30	Thirty

INTERNAL SIGNATURE
G LALITHA
Aadhar Card No : 471749109949

College Seal

PRINCIPAL SIGNATURE
SR PREMA KUMARI
Aadhar Card No : 342643288810

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ANDHRA UNIVERSITY

B A Honours- GRADING SYSTEM DEGREE EXAMINATION - JUNE-2024

AWARD LIST FOR INTERNAL ASSESSMENT

Centre Name : 341-ST ANNs COLLEGE FOR WOMEN, MALKAPURAM,VISAKHAPATNAM

Subject : HISTORY : SCIENCE AND HUMAN PAST SEMESTER : 2 Max Marks : 30 M

S.No.	Regd.No.	Name	Marks Obtained	In Words
1	123134101001	EDULAPAKA NAVYA	28	Twenty-Eight
2	123134101002	L PRAVEENA	30	Thirty
3	123134101003	NAGALA HEMA LATHA	26	Twenty-Six
4	123134101004	PUTI ROOPIKA	30	Thirty
5	123134101005	REGANA VANAJA	27	Twenty-Seven
6	123134101006	SEGGE HAVEELA RANI	29	Twenty-Nine
7	123134101007	YERRA THANMAYI	28	Twenty-Eight

INTERNAL SIGNATURE
G LALITHA
Aadhar Card No : 471745009849

College Seal

PRINCIPAL SIGNATURE
SR PREMA KUMARI
Aadhar Card No : 342843288810

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ANDHRA UNIVERSITY

B A Honours- GRADING SYSTEM DEGREE EXAMINATION - JUNE-2024

AWARD LIST FOR INTERNAL ASSESSMENT

Centre Name : 341-ST.ANN's COLLEGE FOR WOMEN, MALKAPURAM,VISAKHAPATNAM

Subject : HISTORY : SCIENCE AND HUMAN PAST SEMESTER : 2 Max Marks : 30 M

S.No.	Regd.No.	Name	Marks Obtained	In Words
1	123134101008	RAJESHWARI A	29	Twenty-Nine
2	123134101009	SAGARA CHANDRAKALA	26	Twenty-Six
3	123134101010	VANJARI SWETHA KUMARI	30	Thirty

INTERNAL SIGNATURE
G LALITHA
Aadhar Card No : 471748100949

College Seal

PRINCIPAL SIGNATURE
SR PREMA KUMARI
Aadhar Card No : 342843288810

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INTERNAL ASSESSMENT OF DIGITAL MARKETING BBA 1-2

ANDHRA UNIVERSITY

BBA Honours- GRADING SYSTEM DEGREE EXAMINATION – JUNE-2024

AWARD LIST FOR INTERNAL ASSESSMENT

Centre Name : 341-SI ANNs COLLEGE FOR WOMEN, MALKAPURAM,VISAKHAPATNAM

Subject : DIGITAL MARKETING : FUNDAMENTALS OF DIGITAL MARKETING

SEMESTER : 2 Max Marks : 30 M

S.No.	Regd.No.	Name	Marks Obtained	In Words
1	123134107001	ANUSHKA PANDEY	27	Twenty-Seven
2	123134107002	CHERUKURI KAVYA AMRUTHA	27	Twenty-Seven
3	123134107003	DOMMETI DEVAKI	26	Twenty-Six
4	123134107004	ERIGILA LAKSHMANA REKHA SREE	25	Twenty-Five
5	123134107005	GAYATHRI KURMADASU	28	Twenty-Eight
6	123134107006	GODDI RAMYA SRI	26	Twenty-Six
7	123134107007	GURRALA PAVANI	25	Twenty-Five
8	123134107008	KATAKOTI LAHARI PRIYA	30	Thirty
9	123134107009	KILLO ANJALI DEVI	25	Twenty-Five
10	123134107010	KOTA USHA	25	Twenty-Five
11	123134107011	KOTYADA HARITHA	28	Twenty-Eight
12	123134107012	MAICHARLA VARSHITHA	30	Thirty
13	123134107013	MATTA THANUSHAVATHI	25	Twenty-Five
14	123134107014	MOHAMMAD RIHANA	25	Twenty-Five
15	123134107016	NIMMAKAYALA PREETHI	22	Twenty-Two
16	123134107017	S DURGA SRI	25	Twenty-Five
17	123134107018	SANA SONI	22	Twenty-Two
18	123134107019	SUREN ARCHANA	26	Twenty-Six
19	123134107020	THOTADA SANGEETHA	28	Twenty-Eight
20	123134107021	VAIKUNTAM HARIKA	28	Twenty-Eight
21	123134107022	VANAPALLI VENKATA SRIDEVI	25	Twenty-Five
22	123134107025	VANKA KALYANI	24	Twenty-Four
23	123134107026	VURUKUTI RISHMA SREE	28	Twenty-Eight

INTERNAL SIGNATURE
B SANTHI
Aadhar Card No : 323339308380

College Seal

PRINCIPAL SIGNATURE
SR PREMA KUMARI
Aadhar Card No : 342843288810

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INTERNAL ASSESSMENT OF LAW B.COM 2-2

ANDHRA UNIVERSITY

BCOM(CAS)- GRADING SYSTEM DEGREE EXAMINATION - JUNE/JULY-2024

AWARD LIST FOR INTERNAL ASSESSMENT

Centre Name : 311-ST ANN's COLLEGE FOR WOMEN, MALKAPURAM,VISAKHAPATNAM

Subject : BUSINESS LAW

SEMESTER : 4 Max Marks : 25 M

S.No.	Regd.No.	Name	Marks Obtained	In Words
1	12213410400l	ALLADA SOWMYA NIRMALA	23	Twenty-Three
2	12213410400	ANJALI KUMARI	24	Twenty-Four
3	12213410400	BANDI JASMINE	24	Twenty-Four
4	12213410400	BASHEERA BEGUM	20	Twenty
5	12213410400	BODDETI YUVA SREE	24	Twenty-Four
6	12213410400	BODDU PAVANI	23	Twenty-Three
7	12213410400	BORRA KALYANI	22	Twenty-Two
8	12213410400	BYLAPUDI VENKATA ALEKYA	22	Twenty-Two
9	12213410400	CHEPALA RAJESWARI	23	Twenty-Three
10	12213410401	CHILAKALAPALLI SWATHI	20	Twenty
11	12213410401	CHODAVARAPU SUMALATHA	21	Twenty-One
12	12213410401	DARAPU SATYA SRI	23	Twenty-Three
13	12213410401	ERLA SRAVANTHI	25	Twenty-Five
14	12213410401	GADASA ANJULA	22	Twenty-Two
15	12213410401	GADASA RANJULA	22	Twenty-Two
16	12213410401	GOGADA MOUNIKA	23	Twenty-Three
17	12213410401	JAMI HEMA DURGA VENKAT	24	Twenty-Four
18	12213410401	JEERU ALEKHYA	21	Twenty-One
19	12213410402	JERRIPOTHULA DHANA LAKSHMI	21	Twenty-One
20	12213410402	KARI JAYA SREE	20	Twenty
21	12213410402	KODAVALLURI HARIKA	22	Twenty-Two
22	12213410402	KUNDRAPU YAMINI	23	Twenty-Three
23	12213410402	MARISETTY MANASA VYSHNAVI	23	Twenty-Three
24	12213410402	METTA KARUNA KUMARI	20	Twenty
25	12213410403	MOHAMMED SAHIYA BHANU	24	Twenty-Four

INTERNAL SIGNATURE
V V BALAKRISHNA
Aadhar Card No : 720643921464

College Seal

PRINCIPAL SIGNATURE
SR PREMA KUMARI
Aadhar Card No : 342642888810

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ANDHRA UNIVERSITY

B.A Honours (Computer Applications)- GRADING SYSTEM DEGREE EXAMINATION - JUNE-2024

AWARD LIST FOR INTERNAL ASSESSMENT

Centre Name : 311-SI ANNs COLLEGE FOR WOMEN, MALKAPURAM,VISAKHAPATNAM

Subject : PART-I: GENERAL HINDI : HINDI PADYA SAHITYA SEMESTER : 2 Max Marks : 25 M

S.No.	Regd.No.	Name	Marks Obtained	In Words
1	123134104009	DOKKADA CHAMITRA	18	Eighteen
2	123134104019	KHUSHBU KUMARI	21	Twenty-One
3	123134104020	LOKESH KANWAR RATHORE	19	Nineteen
4	123134104022	MOHAMMAD MUNNI	18	Eighteen
5	123134104023	MOHAMMED MAHABOOBUNISHA	24	Twenty-Four
6	123134104025	NAGURU DEEPTHI	15	Fifteen
7	123134104030	POOJA KUMARI	22	Twenty-Two
8	123134104032	PRATIVA RANI MAITY	17	Seventeen
9	123134104033	PRAVITHA ROWLO	23	Twenty-Three
10	123134104040	SATYA SWETHA	24	Twenty-Four
11	123134104042	SHAIK CHANDINI BEEBI	15	Fifteen

INTERNAL SIGNATURE
A ADILAKSHMI
Aadhar Card No : 674881491189

College Seal

PRINCIPAL SIGNATURE
SR PREMA KUMARI
Aadhar Card No : 342843288810

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ANDHRA UNIVERSITY

Honours (Computer Applications)- GRADING SYSTEM DEGREE EXAMINATION - JUNE-2024

AWARD LIST FOR INTERNAL ASSESSMENT

Centre Name : 341-SI ANNs COLLEGE FOR WOMEN, MALKAPURAM,VISAKHAPATNAM

Subject : PART-I: GENERAL HINDI : HINDI PADYA SAHITYA SEMESTER : 2 Max Marks : 25 M

S.No.	Regd.No.	Name	Marks Obtained	In Words
1	123134104009	DOKKADA CHAMITRA	18	Eighteen
2	123134104019	KHUSHBU KUMARI	21	Twenty-One
3	123134104020	LOKESH KANWAR RATHORE	19	Nineteen
4	123134104022	MOHAMMAD MUNNI	18	Eighteen
5	123134104025	MOHAMMED MAHABOOBUNISHA	24	Twenty-Four
6	123134104025	NAGURU DEEPTHI	15	Fifteen
7	123134104030	POOJA KUMARI	22	Twenty-Two
8	123134104032	PRATIVA RANI MAITY	17	Seventeen
9	123134104033	PRAVITHA ROWLO	23	Twenty-Three
10	123134104040	SATYA SWETHA	24	Twenty-Four
11	123134104042	SHAIK CHANDINI BEEBI	15	Fifteen

INTERNAL SIGNATURE
A ADILAKSHMI
Aadhar Card No : 674881491189

College Seal

PRINCIPAL SIGNATURE
SR PREMA KUMARI
Aadhar Card No : 342843288810

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ANDHRA UNIVERSITY

BCA Honours- GRADING SYSTEM DEGREE EXAMINATION - JUNE-2024

AWARD LIST FOR INTERNAL ASSESSMENT

Centre Name : 341-St ANNs COLLEGE FOR WOMEN, MALKAPURAM,VISAKHAPATNAM

Subject : PART-I: GENERAL HINDI : HINDI PADYA SAHITYA SEMESTER : 2 Max Marks : 25 M

S.No.	Regd.No.	Name	Marks Obtained	In Words
1	123134100001	AREFAH NAAZ	16	Sixteen
2	123134100007	DHANGAR MUSKAN	16	Sixteen
3	123134100009	KALEKURI REBECCA GOLD	16	Sixteen
4	123134100016	PALLA SHARMILA	17	Seventeen
5	123134100019	SHAIK SOFIYA	24	Twenty-Four

INTERNAL SIGNATURE
A ADILAKSHMI
Aadhar Card No : 674881491189

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PRINCIPAL SIGNATURE
SR PRIMA KUMARI
Aadhar Card No : 342643288810

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ANDHRA UNIVERSITY

BSC- GRADING SYSTEM DEGREE EXAMINATION - JUNE/JULY-2024

AWARD LIST FOR INTERNAL ASSESSMENT

Centre Name : 341-St ANNs COLLEGE FOR WOMEN, MALKAPURAM,VISAKHAPATNAM

Subject : Part-II: MATHEMATICS Paper-V Linear Algebr SEMESTER : 4 Max Marks : 25 M

S.No.	Regd.No.	Name	Marks Obtained	In Words
26	722134105034	NAGALA ROOPA	20	Twenty
27	722134105035	NOWPADA PUJA	23	Twenty-Three
28	722134105036	NUVULA MOUNIKA	22	Twenty-Two
29	722134105037	PALLA BHARATHI	23	Twenty-Three
30	722134105038	REDDI PRAVALLIKA	21	Twenty-One
31	722134105039	SHABNAM	23	Twenty-Three
32	722134105040	SOBHA SUDHARANI	21	Twenty-One
33	722134105041	TEDLAPU NANDITHA	22	Twenty-Two
34	722134105042	THOKADA GEETHANJALI	21	Twenty-One
35	722134105043	VATADA JHANSI	23	Twenty-Three
36	722134105044	YADLA GAYATHRI	22	Twenty-Two
37	722134105045	YAMMALA NAVYA	23	Twenty-Three

INTERNAL SIGNATURE
G MANJULA
Aadhar Card No : 749025340010

College Seal

PRINCIPAL SIGNATURE
SR PREMA KUMARI
Aadhar Card No : 340843288810

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ANDHRA UNIVERSITY

BSC- GRADING SYSTEM DEGREE EXAMINATION - JUNE/JULY-2024

AWARD LIST FOR INTERNAL ASSESSMENT

Centre Name : 341-St ANNs COLLEGE FOR WOMEN, MALKAPURAM,VISAKHAPATNAM

Subject : Part-II: MATHEMATICS Paper-V Linear Algebr SEMESTER : 4 Max Marks : 25 M

S.No.	Regd.No.	Name	Marks Obtained	In Words
1	722134105009	ARIPILLI PAIDI TALLI	23	Twenty-Three
2	722134105010	BADDU TULASI LATHA	20	Twenty
3	722134105011	BALLA VASANTHI KANAKA MAHALAKSHMI	21	Twenty-One
4	722134105012	BANDARU NAVYA SRI	20	Twenty
5	722134105013	BARIK SWATHI	21	Twenty-One
6	722134105014	BHEEMUNI MYDHILI	20	Twenty
7	722134105015	CHITTALA LOHITHA	22	Twenty-Two
8	722134105016	DHARMALA PALLAVI REDDY	22	Twenty-Two
9	722134105017	DOGGA SAI LAKSHMI	23	Twenty-Three
10	722134105018	ESTARLA SRAVANI	21	Twenty-One
11	722134105019	GOKULAPATI LAVANYA	22	Twenty-Two
12	722134105020	GOLAGANI KEERTHANA	23	Twenty-Three
13	722134105021	GOLAGANI PUJITHA	24	Twenty-Four
14	722134105022	JONNADA PAVANI	22	Twenty-Two
15	722134105023	KAMBALA VASANTHA	23	Twenty-Three
16	722134105024	KOLLI LAKSHMI PRASANNA	21	Twenty-One
17	722134105025	KOLLIVALASA HEMALATHA	22	Twenty-Two
18	722134105026	KONDRA ANURADHA	23	Twenty-Three
19	722134105027	KOORCHANDANI KATHYA	20	Twenty
20	722134105028	KUNDRAPU MADHAVI	22	Twenty-Two
21	722134105029	LALAM BHAVANA	23	Twenty-Three
22	722134105030	LALAM DIVYA	21	Twenty-One
23	722134105031	LANKA MAHALAKSHMI	22	Twenty-Two
24	722134105032	MANDANGI SREE SANTHOSHI GAYATHRI	21	Twenty-One
25	722134105033	MOTURI KUMARI	22	Twenty-Two

INTERNAL SIGNATURE
G MANJULA
Aadhar Card No : 748505346602

College Seal

PRINCIPAL SIGNATURE
SR PREMA KUMARI
Aadhar Card No : 342843288810

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DOCUMENT 6
CLASS SEMESTER TIME TABLE

Class : I B.Com II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	FA Lavanya	Rebikha OAT	Premalatha Eng	Premalatha Eng	Jayasri B W	Anasuya Investment
WED	FA Lavanya	Rebikha OAT	Premalatha Eng	II L	Jayasri B W	Renuka Minor Marketing
TUE	FA Lavanya	Rebikha OAT	Premalatha Eng	II L	Lib	Renuka Minor Marketing
THU	FA Lavanya	Rebikha OAT	Premalatha Eng	II L	Renuka Minor Marketing	Renuka Minor Marketing
FRI	FA Lavanya	Rebikha OAT	Premalatha Eng	Anasuya Investment	MI	Renuka Minor Marketing
SAT	FA Lavanya	Rebikha OAT	Rebikha OAT	Anasuya Investment	Games	------

SUBJECT wise Faculty								
Faculty	Lavanya	Rebikha	Premalatha	Jayasri	Anasuya	Renuka	Lakshmi Devi	Adilakshmi
Subject	Financial Accounting	Office Automation Tools	English	Business Writing	Investment Planning	Marketing	Telugu	Hindi

Class : I B.A II SEMESTER – 2024, FEB Special English (Major)							
DAY	1	2	3	4	5	6	
MON	Spl Eng Roja	History Lalitha	Lib	Spl Eng Joshna	Spl Eng Joshna	Eng Joshna	
WED	Spl Eng Roja	History Lalitha	Games	II L	Spl Eng Joshna	Eng Joshna	
TUE	Spl Eng Roja	History Lalitha	B W Bhagya Lakshmi	II L	Spl Eng Joshna	Eng Joshna	
THU	Spl Eng Roja	History Lalitha	B W Bhagya Lakshmi	II L	Spl Eng Joshna	Eng Joshna	
FRI	Spl Eng Roja	History Lalitha	B W Bhagya Lakshmi	Investment Raju	MI	Eng Joshna	
SAT	Spl Eng Roja	History Lalitha	Lib	Investment Raju	Games	------	

SUBJECT wise Faculty								
Faculty	Lalitha	Roja	Joshna	Bhagya Lakshmi	Raju	Joshna	Lakshmi Devi	Adilakshmi
Subject	History	Special English	Special English	Business Writing	Investment Planning	English	Telugu	Hindi

Class : Maths (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	English Joshna	S.G Sunitha	Lib	B W Alekhya
TUE	D.E Manjula	D.E Manjula	English Joshna	S.G Sunitha	II L	B W Alekhya
WED	D.E Manjula	D.E Manjula	English Joshna	S.G Sunitha	II L	Investment Divya
THU	D.E Manjula	Minor	English Joshna	S.G Sunitha	II L	Investment Divya
FRI	D.E Manjula	Minor	English Joshna	S.G Sunitha	MI	B W Alekhya
SAT	Minor	Minor	Lib	S.G Sunitha	Games	-------

SUBJECT wise Faculty								
Faculty	Manjula	Sunitha	Joshna	Alekhya	Divya		Lakshmi Devi	Adilakshmi
Subject	Differential Equation	Solid Geometry	English	Business Writing	Investment Planning	Minor	Telugu	Hindi

Class : Chemistry (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	English Joshna	I Chem Anjali	Lib	B W Alekhya
TUE	G & I Che Valisha	G & I Che Valisha	English Joshna	I Chem Anjali	II L	B W Alekhya
WED	G & I Che Valisha	G & I Che Valisha	English Joshna	I Chem Anjali	II L	Investment Divya
THU	G & I Che Valisha	Minor	English Joshna	I Chem Anjali	II L	Investment Divya
FRI	G & I Che Valisha	Minor	English Joshna	I Chem Anjali	MI	B W Alekhya
SAT	Minor	Minor	Lib	I Chem Anjali	Games	-------

SUBJECT wise Faculty								
Faculty	Ms.Valisha	Ms.Anjali	Ms.Joshna	Ms. Alekhya	Ms.Divya		Ms.Lakshmi Devi	Ms.Adilakshmi
Subject	General & In Organic Chemistry	In Organic Chemistry	English	Business Writing	Investment Planning	Minor	Telugu	Hindi

Class : CBZ IV SEMESTER FEB 2024						
DAY	1	2	3	4	5	6
MON	Botany	Botany	Zoology	Chemistry Valisha	Zoology	Zoology
TUE	Botany	Chemistry Anjali	Zoology	Chemistry Valisha	Botany	Zoology
WED	Botany (Project)	Chemistry Anjali	Zoology	Zoology	Botany	Zoology
THU	Chemistry Anjali	Chemistry Anjali	Zoology	Chemistry Valisha	Botany	Botany
FRI	Botany	Chemistry Anjali	Zoology	Chemistry Valisha	Botany	Games
SAT	Botany	MI	Chemistry Anjali	Chemistry Valisha	Chemistry Valisha	-----

Class : MB IV SEMESTER FEB 2024						
DAY	1	2	3	4	5	6
MON	Micro Biology	Micro Biology	LIB	Chemistry Valisha	Micro Biology	Bio Chemistry
TUE	Bio Chemistry	Chemistry Anjali	Micro Biology	Chemistry Valisha	Bio Chemistry	Bio Chemistry
WED	Bio Chemistry	Chemistry Anjali	Micro Biology	Games	Bio Chemistry	Bio Chemistry
THU	Chemistry Anjali	Chemistry Anjali	Micro Biology	Chemistry Valisha	Bio Chemistry	Bio Chemistry
FRI	Bio Chemistry	Chemistry Anjali	Micro Biology	Chemistry Valisha	Micro Biology	Bio Chemistry
SAT	Micro Biology	MI	Chemistry Anjali	Chemistry Valisha	Chemistry Valisha	----

Class : I B.Com II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	FA Lavanya	Rebikha OAT	Premalatha Eng	Premalatha Eng	Jayasri B W	Anasuya Investment
WED	FA Lavanya	Rebikha OAT	Premalatha Eng	H L	Jayasri B W	Renuka Minor Marketing
TUE	FA Lavanya	Rebikha OAT	Premalatha Eng	H L	Lib	Renuka Minor Marketing
THU	FA Lavanya	Rebikha OAT	Premalatha Eng	H L	Renuka Minor Marketing	Renuka Minor Marketing
FRI	FA Lavanya	Rebikha OAT	Premalatha Eng	Anasuya Investment	MI	Renuka Minor Marketing
SAT	FA Lavanya	Rebikha OAT	Rebikha OAT	Anasuya Investment	Games	——

SUBJECT wise Faculty								
Faculty	Lavanya	Rebikha	Premalatha	Jayasri	Anasuya	Renuka	Lakshmi Devi	Adilakshmi
Subject	Financial Accounting	Office Automation Tools	English	Business Writing	Investment Planning	Marketing	Telugu	Hindi

Class : I B.A II SEMESTER – 2024, FEB Special English (Major)							
DAY	1	2	3	4	5	6	
MON	Spl Eng Roja	History Lalitha	Lib	Spl Eng Joshna	Spl Eng Joshna	Eng Joshna	
WED	Spl Eng Roja	History Lalitha	Games	H L	Spl Eng Joshna	Eng Joshna	
TUE	Spl Eng Roja	History Lalitha	B W Bhagya Lakshmi	H L	Spl Eng Joshna	Eng Joshna	
THU	Spl Eng Roja	History Lalitha	B W Bhagya Lakshmi	H L	Spl Eng Joshna	Eng Joshna	
FRI	Spl Eng Roja	History Lalitha	B W Bhagya Lakshmi	Investment Raju	MI	Eng Joshna	
SAT	Spl Eng Roja	History Lalitha	Lib	Investment Raju	Games	——	

SUBJECT wise Faculty								
Faculty	Lalitha	Roja	Joshna	Bhagya Lakshmi	Raju	Joshna	Lakshmi Devi	Adilakshmi
Subject	History	Special English	Special English	Business Writing	Investment Planning	English	Telugu	Hindi

Class : I B.C.A II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Programming in C Manu	Minor DM Divya Jyothi	Investment Bhagya Lakshmi	OAT Rebikha	OAT Rebikha	Eng Joshna
WED	Programming in C Manu	Minor DM Divya Jyothi	Investment Bhagya Lakshmi	H L	OAT Rebikha	Eng Joshna
TUE	Programming in C Manu	Minor DM Divya Jyothi	Business Alekya	H L	OAT Rebikha	Eng Joshna
THU	Programming in C Manu	Minor DM Divya Jyothi	Business Alekya	H L	OAT Rebikha	Eng Joshna
FRI	Programming in C Manu	Minor DM Divya Jyothi	Business Alekya	Lib	MI	Eng Joshna
SAT	Programming in C Manu	Minor DM Divya Jyothi	Lib	Games	OAT Rebikha	——

SUBJECT wise Faculty								
Faculty	Manu	Rebikha	Divya Jyothi	Alekya	Bhagya Lakshmi	Joshna	Lakshmi Devi	Adilakshmi
Subject	Programm in C	Office Automati on Tools	Minor Digital Marketing	Business Writing	Investment Planning	English	Telugu	Hindi

Class : I B.B.A II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	B.Eco Raju	POM Renuka	Minor Dm Shanthi	G.K Lakshmi Devi	POM Renuka	Eng Joshna
Tue	B.Eco Raju	POM Renuka	Minor Dm Shanthi	II L	Lib	Eng Joshna
Wed	B.Eco Raju	POM Renuka	BW Bhagya Lakshmi	II L	POM Renuka	Eng Joshna
THU	B.Eco Raju	Minor Dm Shanthi	BW Bhagya Lakshmi	II L	Games	Eng Joshna
FRI	B.Eco Raju	Minor Dm Shanthi	BW Bhagya Lakshmi	Investment Raju	MI	Eng Joshna
SAT	B.Eco Raju	POM Renuka	Games	Investment Raju	Minor Dm Shanthi	------

SUBJECT wise Faculty								
Faculty	Raju	Renuka	Shanthi	Bhagya lakshmi	Lakshmi Devi	Joshna	Lakshmi Devi	Adilakshmi
Subject	Business Economics	Principals Of Management	Minor Digital Marketing	Business Writing	General Knowledge	English	Telugu	Hindi

Class : I B.A II SEMESTER – 2024, FEB Political Science (Major)						
DAY	1	2	3	4	5	6
MON	PS Anasuya	History Lalitha	Lib	PS Anasuya	PS Bhagya Lakshmi	Eng Joshna
WED	PS Anasuya	History Lalitha	Games	II L	PS Bhagya Lakshmi	Eng Joshna
TUE	PS Anasuya	History Lalitha	B W Bhagya Lakshmi	II L	PS Bhagya Lakshmi	Eng Joshna
THU	PS Anasuya	History Lalitha	B W Bhagya Lakshmi	II L	PS Bhagya Lakshmi	Eng Joshna
FRI	PS Anasuya	History Lalitha	B W Bhagya Lakshmi	Investment Raju	MI	Eng Joshna
SAT	PS Anasuya	History Lalitha	PS Bhagya Lakshmi	Investment Raju	PS Bhagya Lakshmi	------

SUBJECT wise Faculty								
Faculty	Lalitha	Joshna	Anasuya	Bhagya Lakshmi	Raju	Bhagya Lakshmi	Lakshmi Devi	Adilakshmi
Subject	History	English	Political Science	Business Writing	Investment Planning	Political Science	Telugu	Hindi

Class : I B.B.A II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	B.Eco Raju	POM Renuka	Minor Dm Shanthi	G.K Lakshmi Devi	POM Renuka	Eng Joshna
Tue	B.Eco Raju	POM Renuka	Minor Dm Shanthi	II L	Lib	Eng Joshna
Wed	B.Eco Raju	POM Renuka	BW Bhagya Lakshmi	II L	POM Renuka	Eng Joshna
THU	B.Eco Raju	Minor Dm Shanthi	BW Bhagya Lakshmi	II L	Games	Eng Joshna
FRI	B.Eco Raju	Minor Dm Shanthi	BW Bhagya Lakshmi	Investment Raju	MI	Eng Joshna
SAT	B.Eco Raju	POM Renuka	Games	Investment Raju	Minor Dm Shanthi	------

SUBJECT wise Faculty								
Faculty	Raju	Renuka	Shanthi	Bhagya lakshmi	Lakshmi Devi	Joshna	Lakshmi Devi	Adilakshmi
Subject	Business Economics	Principals Of Management	Minor Digital Marketing	Business Writing	General Knowledge	English	Telugu	Hindi

Class : I B.A II SEMESTER – 2024, FEB Political Science (Major)						
DAY	1	2	3	4	5	6
MON	PS Anasuya	History Lalitha	Lib	PS Anasuya	PS Bhagya Lakshmi	Eng Joshna
WED	PS Anasuya	History Lalitha	Games	II L	PS Bhagya Lakshmi	Eng Joshna
TUE	PS Anasuya	History Lalitha	B W Bhagya Lakshmi	II L	PS Bhagya Lakshmi	Eng Joshna
THU	PS Anasuya	History Lalitha	B W Bhagya Lakshmi	II L	PS Bhagya Lakshmi	Eng Joshna
FRI	PS Anasuya	History Lalitha	B W Bhagya Lakshmi	Investment Raju	MI	Eng Joshna
SAT	PS Anasuya	History Lalitha	PS Bhagya Lakshmi	Investment Raju	PS Bhagya Lakshmi	------

SUBJECT wise Faculty								
Faculty	Lalitha	Joshna	Anasuya	Bhagya Lakshmi	Raju	Bhagya Lakshmi	Lakshmi Devi	Adilakshmi
Subject	History	English	Political Science	Business Writing	Investment Planning	Political Science	Telugu	Hindi

Class : I B.C.A II SEMESTER – 2024, FEB							
DAY	1	2	3	4	5	6	
MON	Programming in C Manu	Minor DM Divya Jyothi	Investment Bhagya Lakshmi	OAT Rebikha	OAT Rebikha	Eng Joshna	
WED	Programming in C Manu	Minor DM Divya Jyothi	Investment Bhagya Lakshmi	II L	OAT Rebikha	Eng Joshna	
TUE	Programming in C Manu	Minor DM Divya Jyothi	B.W Alekya	II L	OAT Rebikha	Eng Joshna	
THU	Programming in C Manu	Minor DM Divya Jyothi	B.W Alekya	II L	OAT Rebikha	Eng Joshna	
FRI	Programming in C Manu	Minor DM Divya Jyothi	B.W Alekya	Lib	MI	Eng Joshna	
SAT	Programming in C Manu	Minor DM Divya Jyothi	Lib	Games	OAT Rebikha	------	
SUBJECT wise Faculty							
Faculty	Manu	Rebikha	Divya Jyothi	Alekya	Bhagya Lakshmi	Joshna	Lakshmi Devi	Adilakshmi
Subject	Programm in C	Office Automati on Tools	Minor Digital Marketing	Business Writing	Investment Planning	English	Telugu	Hindi

Class : I B.B.A II SEMESTER – 2024, FEB							
DAY	1	2	3	4	5	6	
MON	B.Eco Raju	POM Renuka	Minor Dm Shanthi	G.K Lakshmi Devi	POM Renuka	Eng Joshna	
Tue	B.Eco Raju	POM Renuka	Minor Dm Shanthi	II L	Lib	Eng Joshna	
Wed	B.Eco Raju	POM Renuka	BW Bhagya Lakshmi	II L	POM Renuka	Eng Joshna	
THU	B.Eco Raju	Minor Dm Shanthi	BW Bhagya Lakshmi	II L	Games	Eng Joshna	
FRI	B.Eco Raju	Minor Dm Shanthi	BW Bhagya Lakshmi	Investment Raju	MI	Eng Joshna	
SAT	B.Eco Raju	POM Renuka	Games	Investment Raju	Minor Dm Shanthi	------	
SUBJECT wise Faculty							
Faculty	Raju	Renuka	Shanthi	Bhagya lakshmi	Lakshmi Devi	Joshna	Lakshmi Devi	Adilakshmi
Subject	Business Economics	Principals Of Manageme nt	Minor Digital Marketing	Business Writing	General Knowledge	English	Telugu	Hindi

Class : Physics (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	English Joshna	Major Physics Triveni	Major Physics Triveni	B W Alekhya
TUE	Creative work Lakshmi Devi	Major Physics Triveni	English Joshna	Major Physics Triveni	II L	B W Alekhya
WED	Lib	Major Physics Triveni	English Joshna	Major Physics Triveni	II L	Investment Divya
THU	Major Physics Triveni	Minor	English Joshna	Major Physics Triveni	II L	Investment Divya
FRI	Major Physics Triveni	Minor	English Joshna	Major Physics Triveni	MI	B W Alekhya
SAT	Minor	Minor	Major Physics Triveni	Major Physics Triveni	Games	------

SUBJECT wise Faculty								
Faculty	Triveni	Lakshmi Devi	Joshna	Alekhya	Divya		Lakshmi Devi	Adilakshmi
Subject	Major Physics	Creative work	English	Business Writing	Investment Planning	Minor	Telugu	Hindi

Class : Computer Science (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	D.L.D Sharina	Investment Raju	English Roja	Investment Raju
TUE	D.L.D Sharina	Programming in C Shanti Rani	Investment Raju	II L	English Roja	Programming in C Shanti Rani
WED	D.L.D Sharina	Programming in C Shanti Rani	B W Jaya Sri	II L	English Roja	Programming in C Shanti Rani
THU	D.L.D Sharina	Minor	B W Jaya Sri	II L	English Roja	Programming in C Shanti Rani
FRI	D.L.D Sharina	Minor	B W Jaya Sri	Lib	MI	Programming in C Shanti Rani
SAT	Minor	Minor	D.L.D Sharina	Games	English Roja	------

SUBJECT wise Faculty								
Faculty	Ms.Sharina	Ms.Shanti Rani	Ms.Roja	Ms.Jaya Sri	Raju		Lakshmi Devi	Adilakshmi
Subject	Digital Logic Design	Programming in C	English	Business Writing	Investment Planning	Minor	Telugu	Hindi

Class : I B.B.A II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	B.Eco Raju	POM Renuka	Minor Dm Shanthi	G.K Lakshmi Devi	POM Renuka	Eng Joshna
Tue	B.Eco Raju	POM Renuka	Minor Dm Shanthi	H L	Lib	Eng Joshna
Wed	B.Eco Raju	POM Renuka	BW Bhagya Lakshmi	H L	POM Renuka	Eng Joshna
THU	B.Eco Raju	Minor Dm Shanthi	BW Bhagya Lakshmi	H L	Games	Eng Joshna
FRI	B.Eco Raju	Minor Dm Shanthi	BW Bhagya Lakshmi	Investment Raju	MI	Eng Joshna
SAT	B.Eco Raju	POM Renuka	Games	Investment Raju	Minor Dm Shanthi	------

SUBJECT wise Faculty								
Faculty	Raju	Renuka	Shanthi	Bhagya lakshmi	Lakshmi Devi	Joshna	Lakshmi Devi	Adilakshmi
Subject	Business Economics	Principals Of Management	Minor Digital Marketing	Business Writing	General Knowledge	English	Telugu	Hindi

Class : I B.A II SEMESTER – 2024, FEB Political Science (Major)						
DAY	1	2	3	4	5	6
MON	PS Anasuya	History Lalitha	Lib	PS Anasuya	PS Bhagya Lakshmi	Eng Joshna
WED	PS Anasuya	History Lalitha	Games	H L	PS Bhagya Lakshmi	Eng Joshna
TUE	PS Anasuya	History Lalitha	B W Bhagya Lakshmi	H L	PS Bhagya Lakshmi	Eng Joshna
THU	PS Anasuya	History Lalitha	B W Bhagya Lakshmi	H L	PS Bhagya Lakshmi	Eng Joshna
FRI	PS Anasuya	History Lalitha	B W Bhagya Lakshmi	Investment Raju	MI	Eng Joshna
SAT	PS Anasuya	History Lalitha	PS Bhagya Lakshmi	Investment Raju	PS Bhagya Lakshmi	------

SUBJECT wise Faculty								
Faculty	Lalitha	Joshna	Anasuya	Bhagya Lakshmi	Raju	Bhagya Lakshmi	Lakshmi Devi	Adilakshmi
Subject	History	English	Political Science	Business Writing	Investment Planning	Political Science	Telugu	Hindi

Class : I B.A II SEMESTER – 2024, FEB Political Science (Major)							
DAY	1	2	3	4	5	6	
MON	PS Anasuya	History Lalitha	Lib	PS Anasuya	PS Bhagya Lakshmi	Eng Joshna	
WED	PS Anasuya	History Lalitha	Games	II L	PS Bhagya Lakshmi	Eng Joshna	
TUE	PS Anasuya	History Lalitha	B W Bhagya Lakshmi	II L	PS Bhagya Lakshmi	Eng Joshna	
THU	PS Anasuya	History Lalitha	B W Bhagya Lakshmi	II L	PS Bhagya Lakshmi	Eng Joshna	
FRI	PS Anasuya	History Lalitha	B W Bhagya Lakshmi	Investment Raju	MI	Eng Joshna	
SAT	PS Anasuya	History Lalitha	PS Bhagya Lakshmi	Investment Raju	PS Bhagya Lakshmi	------	

	SUBJECT wise Faculty							
Faculty	Lalitha	Joshna	Anasuya	Bhagya Lakshmi	Raju	Bhagya Lakshmi	Lakshmi Devi	Adilakshmi
Subject	History	English	Political Science	Business Writing	Investment Planning	Political Science	Telugu	Hindi

Class : Zoology (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	English Roja	Zoology Lakshmi Tulasi	Creative Work Lakshmi Devi	B W Jaya Sri
TUE	Zoology Lakshmi Tulasi	Zoology Lakshmi Tulasi	English Roja	LIB	H L	B W Jaya Sri
WED	Zoology Lakshmi Tulasi	Zoology Lakshmi Tulasi	English Roja	Investmenr Raju	H L	Investment Raju
THU	Zoology Lakshmi Tulasi	Minor	English Roja	Zoology Lakshmi Tulasi	H L	Investment Raju
FRI	Zoology Lakshmi Tulasi	Minor	English Roja	Zoology Lakshmi Tulasi	MI	Games
SAT	Minor	Minor	English Roja	Zoology Lakshmi Tulasi	Games	——

SUBJECT wise Faculty								
Faculty		Ms.Roja	Ms.Lakshmi Tulasi	Ms. Jaya Sri	Mr.Raju		Ms.Lakshmi Devi	Ms.Adilakshmi
Subject		English	Zoology	Business Writing	Investment Planning	Minor	Telugu	Hindi

Class : I B.A II SEMESTER – 2024, FEB Political Science (Major)							
DAY	1	2	3	4	5	6	
MON	PS Anasuya	History Lalitha	Lib	PS Anasuya	PS Bhagya Lakshmi	Eng Joshna	
WED	PS Anasuya	History Lalitha	Games	II L	PS Bhagya Lakshmi	Eng Joshna	
TUE	PS Anasuya	History Lalitha	B W Bhagya Lakshmi	II L	PS Bhagya Lakshmi	Eng Joshna	
THU	PS Anasuya	History Lalitha	B W Bhagya Lakshmi	II L	PS Bhagya Lakshmi	Eng Joshna	
FRI	PS Anasuya	History Lalitha	B W Bhagya Lakshmi	Investment Raju	MI	Eng Joshna	
SAT	PS Anasuya	History Lalitha	PS Bhagya Lakshmi	Investment Raju	PS Bhagya Lakshmi	------	

SUBJECT wise Faculty								
Faculty	Lalitha	Joshna	Anasuya	Bhagya Lakshmi	Raju	Bhagya Lakshmi	Lakshmi Devi	Adilakshmi
Subject	History	English	Political Science	Business Writing	Investment Planning	Political Science	Telugu	Hindi

Class : Botany (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	English Roja	Botany Adiseshu	Botany Adiseshu	B W Jaya Sri
TUE	LIB	Botany Adiseshu	English Roja	Botany Adiseshu	II L	B W Jaya Sri
WED	PLANT PROPAGATION PROJECT ADI SESHU	Botany Adiseshu	English Roja	Botany Adiseshu	II L	Investment Raju
THU	BOTANY ADI SESHU	Minor	English Roja	Botany Adiseshu	II L	Investment Raju
FRI	BOTANY ADI SESHU	Minor	English Roja	Botany Adiseshu	MI	Games
SAT	Minor	Minor	English Roja	Botany Adiseshu	Botany Adiseshu	------

SUBJECT wise Faculty								
Faculty		Mrs.Roja	Dr.Adisheshu	Mrs.Jaya Sri	Mr.Raju		Ms.Lakshmi Devi	Ms.Adilakshmi
Subject		English	Botany	Business Writing	Investment Planning	Minor	Telugu	Hindi

Class : Microbiology (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	English Roja	MB Prasanthi	Creative Work Lakshmi Devi	B W Jaya Sri
WED	MB Prasanthi	MB Prasanthi	English Roja	LIB	II L	B W Jaya Sri
TUE	MB Prasanthi	MB Prasanthi	English Roja	GAMES	II L	Investment Raju
THU	MB Prasanthi	Minor	English Roja	MB Prasanthi	II L	Investment Raju
FRI	MB Prasanthi	Minor	English Roja	LIB	MI	Games
SAT	Minor	Minor	English Roja	MB Prasanthi	MB Prasanthi	------

SUBJECT wise Faculty								
Faculty		Ms.Roja	Ms.Prasanthi	Ms.Jaya Sri	Mr.Raju		Ms.Lakshmi Devi	Ms. Adilakshmi
Subject		English	Micro biology	Business Writing	Investment Planning	Minor	Telugu	Hindi

Class : MSCS IV SEMESTER FEB 2024						
DAY	1	2	3	4	5	6
MON	Statistics	Statistics	Computer science Shanthi rani	Maths Manjula	Computer science Mahalakshmi	Maths Sunitha
TUE	Statistics	Statistics	Computer science Shanthi rani	Maths Manjula	Computer science Mahalakshmi	Maths Sunitha
WED	Statistics	Statistics	Games	Maths Manjula	Computer science Mahalakshmi	Maths Sunitha
THU	Statistics	Statistics	Computer science Shanthi rani	Maths Manjula	Computer science Mahalakshmi	Maths Sunitha
FRI	Statistics	LIB	Computer science Shanthi rani	Maths Manjula	Computer science Mahalakshmi	Maths Sunitha
SAT	Statistics	MI	Computer science Shanthi rani	Maths Manjula	Statistics	Maths Sunitha

Class : BA IV SEMESTER FEB 2024						
DAY	1	2	3	4	5	6
MON	Special English Joshna	Special English Roja	P.S Anasuya	History Lalitha	History Lalitha	PS Bhagyalakshmi
TUE	Special English Joshna	Special English Roja	P.S Anasuya	History Lalitha	History Lalitha	PS Bhagyalakshmi
WED	Special English Joshna	Special English Roja	P.S Anasuya	History Lalitha	History Lalitha	PS Bhagyalakshmi
THU	Special English Joshna	Special English Roja	P.S Anasuya	History Lalitha	History Lalitha	PS Bhagyalakshmi
FRI	Special English Joshna	Special English Roja	LIB	History Lalitha	History Lalitha	PS Bhagyalakshmi
SAT	Special English Joshna	MI	P.S Anasuya	History Lalitha	Games	----

Class : Zoology (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	English Roja	Zoology Lakshmi Tulasi	Creative Work Lakshmi Devi	B W Jaya Sri
TUE	Zoology Lakshmi Tulasi	Zoology Lakshmi Tulasi	English Roja	LIB	H L	B W Jaya Sri
WED	Zoology Lakshmi Tulasi	Zoology Lakshmi Tulasi	English Roja	Investmenr Raju	H L	Investment Raju
THU	Zoology Lakshmi Tulasi	Minor	English Roja	Zoology Lakshmi Tulasi	H L	Investment Raju
FRI	Zoology Lakshmi Tulasi	Minor	English Roja	Zoology Lakshmi Tulasi	MI	Games
SAT	Minor	Minor	English Roja	Zoology Lakshmi Tulasi	Games	——

SUBJECT wise Faculty								
Faculty		Ms.Roja	Ms.Lakshmi Tulasi	Ms. Jaya Sri	Mr.Raju		Ms.Lakshmi Devi	Ms.Adilakshmi
Subject		English	Zoology	Business Writing	Investment Planning	Min or	Telugu	Hindi

Class : Maths (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	English Joshna	S.G Sunitha	Lib	B W Alekhya
TUE	D.E Manjula	D.E Manjula	English Joshna	S.G Sunitha	II L	B W Alekhya
WED	D.E Manjula	D.E Manjula	English Joshna	S.G Sunitha	II L	Investment Divya
THU	D.E Manjula	Minor	English Joshna	S.G Sunitha	II L	Investment Divya
FRI	D.E Manjula	Minor	English Joshna	S.G Sunitha	MI	B W Alekhya
SAT	Minor	Minor	Lib	S.G Sunitha	Games	------

SUBJECT wise Faculty								
Faculty	Manjula	Sunitha	Joshna	Alekhya	Divya		Lakshmi Devi	Adilakshmi
Subject	Differential Equation	Solid Geometry	English	Business Writing	Investment Planning	Minor	Telugu	Hindi

Class : Chemistry (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	English Joshna	I Chem Anjali	Lib	B W Alekhya
TUE	G & I Che Valisha	G & I Che Valisha	English Joshna	I Chem Anjali	II L	B W Alekhya
WED	G & I Che Valisha	G & I Che Valisha	English Joshna	I Chem Anjali	II L	Investment Divya
THU	G & I Che Valisha	Minor	English Joshna	I Chem Anjali	II L	Investment Divya
FRI	G & I Che Valisha	Minor	English Joshna	I Chem Anjali	MI	B W Alekhya
SAT	Minor	Minor	Lib	I Chem Anjali	Games	------

SUBJECT wise Faculty								
Faculty	Ms.Valisha	Ms.Anjali	Ms.Joshna	Ms. Alekhya	Ms.Divya		Ms.Lakshmi Devi	Ms.Adilakshmi
Subject	General & In Organic Chemistry	In Organic Chemistry	English	Business Writing	Investment Planning	Minor	Telugu	Hindi

Class : Physics (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	English Joshna	Major Physics Triveni	Major Physics Triveni	B W Alekhya
TUE	Creative work Lakshmi Devi	Major Physics Triveni	English Joshna	Major Physics Triveni	II L	B W Alekhya
WED	Lib	Major Physics Triveni	English Joshna	Major Physics Triveni	II L	Investment Divya
THU	Major Physics Triveni	Minor	English Joshna	Major Physics Triveni	II L	Investment Divya
FRI	Major Physics Triveni	Minor	English Joshna	Major Physics Triveni	MI	B W Alekhya
SAT	Minor	Minor	Major Physics Triveni	Major Physics Triveni	Games	------

SUBJECT wise Faculty								
Faculty	Triveni	Lakshmi Devi	Joshna	Alekhya	Divya		Lakshmi Devi	Adilakshmi
Subject	Major Physics	Creative work	English	Business Writing	Investment Planning	Minor	Telugu	Hindi

Class : Microbiology (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	English Roja	MB Prasanthi	Creative Work Lakshmi Devi	B W Jaya Sri
WED	MB Prasanthi	MB Prasanthi	English Roja	LIB	II L	B W Jaya Sri
TUE	MB Prasanthi	MB Prasanthi	English Roja	GAMES	II L	Investment Raju
THU	MB Prasanthi	Minor	English Roja	MB Prasanthi	II L	Investment Raju
FRI	MB Prasanthi	Minor	English Roja	LIB	MI	Games
SAT	Minor	Minor	English Roja	MB Prasanthi	MB Prasanthi	------

SUBJECT wise Faculty							
Faculty	Ms.Roja	Ms.Prasanthi	Ms.Jaya Sri	Mr.Raju		Ms.Lakshmi Devi	Ms. Adilakshmi
Subject	English	Micro biology	Business Writing	Investment Planning	Mino r	Telugu	Hindi

Class : B.com (General) IV SEMESTER FEB 2024						
DAY	1	2	3	4	5	6
MON	Business Law Bala krishna	GST Bala Krishna	Auditing Lavanya	Taxation Lavanya	Corporate A/C Alekhya	CMA Divya
TUE	Business Law Bala krishna	GST Bala Krishna	Auditing Lavanya	Taxation Lavanya	Corporate A/C Alekhya	CMA Divya
WED	Business Law Bala krishna	GST Bala Krishna	Auditing Lavanya	Taxation Lavanya	Corporate A/C Alekhya	LIB
THU	Business Law Bala krishna	GST Bala Krishna	Auditing Lavanya	Taxation Lavanya	Corporate A/C Alekhya	Games
FRI	Business Law Bala krishna	GST Bala Krishna	Auditing Lavanya	Taxation Lavanya	Corporate A/C Alekhya	CMA Divya
SAT	CMA Divya	MI	CMA Divya	Taxation Lavanya	Corporate A/C Alekhya	----

Class : B.com (Vocational) IV SEMESTER FEB 2024						
DAY	1	2	3	4	5	6
MON	Business Law Bala krishna	Java Mahalakshmi	DBMS Maha lakshmi	Taxation Lavanya	Corporate A/C Alekhya	CMA Divya
TUE	Business Law Bala krishna	Java Mahalakshmi	DBMS Maha lakshmi	Taxation Lavanya	Corporate A/C Alekhya	CMA Divya
WED	Business Law Bala krishna	Java Mahalakshmi	DBMS Maha lakshmi	Taxation Lavanya	Corporate A/C Alekhya	LIB
THU	Business Law Bala krishna	Java Mahalakshmi	DBMS Maha lakshmi	Taxation Lavanya	Corporate A/C Alekhya	Games
FRI	Business Law Bala krishna	Java Mahalakshmi	DBMS Maha lakshmi	Taxation Lavanya	Corporate A/C Alekhya	CMA Divya
SAT	CMA Divya	MI	CMA Divya	Taxation Lavanya	Corporate A/C Alekhya	----

Class : Maths (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	English Joshna	S.G Sunitha	Lib	B W Alekhya
TUE	D.E Manjula	D.E Manjula	English Joshna	S.G Sunitha	II L	B W Alekhya
WED	D.E Manjula	D.E Manjula	English Joshna	S.G Sunitha	II L	Investment Divya
THU	D.E Manjula	Minor	English Joshna	S.G Sunitha	II L	Investment Divya
FRI	D.E Manjula	Minor	English Joshna	S.G Sunitha	MI	B W Alekhya
SAT	Minor	Minor	Lib	S.G Sunitha	Games	———

SUBJECT wise Faculty								
Faculty	Manjula	Sunitha	Joshna	Alekhya	Divya		Lakshmi Devi	Adilakshmi
Subject	Differential Equation	Solid Geometry	English	Business Writing	Investment Planning	Minor	Telugu	Hindi

Class : Chemistry (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	English Joshna	I Chem Anjali	Lib	B W Alekhya
TUE	G & I Che Valisha	G & I Che Valisha	English Joshna	I Chem Anjali	II L	B W Alekhya
WED	G & I Che Valisha	G & I Che Valisha	English Joshna	I Chem Anjali	II L	Investment Divya
THU	G & I Che Valisha	Minor	English Joshna	I Chem Anjali	II L	Investment Divya
FRI	G & I Che Valisha	Minor	English Joshna	I Chem Anjali	MI	B W Alekhya
SAT	Minor	Minor	Lib	I Chem Anjali	Games	———

SUBJECT wise Faculty								
Faculty	Ms.Valisha	Ms.Anjali	Ms.Joshna	Ms. Alekhya	Ms.Divya		Ms.Lakshmi Devi	Ms.Adilakshmi
Subject	General & In Organic Chemistry	In Organic Chemistry	English	Business Writing	Investment Planning	Minor	Telugu	Hindi

Class : Physics (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	English Joshna	Major Physics Triveni	Major Physics Triveni	B W Alekhya
TUE	Creative work Lakshmi Devi	Major Physics Triveni	English Joshna	Major Physics Triveni	II L	B W Alekhya
WED	Lib	Major Physics Triveni	English Joshna	Major Physics Triveni	II L	Investment Divya
THU	Major Physics Triveni	Minor	English Joshna	Major Physics Triveni	II L	Investment Divya
FRI	Major Physics Triveni	Minor	English Joshna	Major Physics Triveni	MI	B W Alekhya
SAT	Minor	Minor	Major Physics Triveni	Major Physics Triveni	Games	———

SUBJECT wise Faculty								
Faculty	Triveni	Lakshmi Devi	Joshna	Alekhya	Divya		Lakshmi Devi	Adilakshmi
Subject	Major Physics	Creative work	English	Business Writing	Investment Planning	Minor	Telugu	Hindi

Class : Computer Science (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	D.L.D Sharina	Investment Raju	English Roja	Investment Raju
TUE	D.L.D Sharina	Programming in C Shanti Rani	Investment Raju	H L	English Roja	Programming in C Shanti Rani
WED	D.L.D Sharina	Programming in C Shanti Rani	B W Jaya Sri	H L	English Roja	Programming in C Shanti Rani
THU	D.L.D Sharina	Minor	B W Jaya Sri	H L	English Roja	Programming in C Shanti Rani
FRI	D.L.D Sharina	Minor	B W Jaya Sri	Lib	MI	Programming in C Shanti Rani
SAT	Minor	Minor	D.L.D Sharina	Games	English Roja	———

SUBJECT wise Faculty								
Faculty	Ms.Sharina	Ms.Shanti Rani	Ms.Roja	Ms.Jaya Sri	Raju		Lakshmi Devi	Adilakshmi
Subject	Digital Logic Design	Programming in C	English	Business Writing	Investment Planning	Minor	Telugu	Hindi

Class : Botany (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	English Roja	Botany Adiseshu	Botany Adiseshu	B W Jaya Sri
TUE	LIB	Botany Adiseshu	English Roja	Botany Adiseshu	H L	B W Jaya Sri
WED	PLANT PROPAGATION PROJECT ADI SESHU	Botany Adiseshu	English Roja	Botany Adiseshu	H L	Investment Raju
THU	BOTANY ADI SESHU	Minor	English Roja	Botany Adiseshu	H L	Investment Raju
FRI	BOTANY ADI SESHU	Minor	English Roja	Botany Adiseshu	MI	Games
SAT	Minor	Minor	English Roja	Botany Adiseshu	Botany Adiseshu	———

SUBJECT wise Faculty								
Faculty	Mrs.Roja	Dr.Adisheshu	Mrs.Jaya Sri	Mr.Raju		Ms.Lakshmi Devi	Ms.Adilakshmi	
Subject	English	Botany	Business Writing	Investment Planning	Minor	Telugu	Hindi	

Class : Microbiology (Major) II SEMESTER – 2024, FEB						
DAY	1	2	3	4	5	6
MON	Minor	Minor	English Roja	MB Prasanthi	Creative Work Lakshmi Devi	B W Jaya Sri
WED	MB Prasanthi	MB Prasanthi	English Roja	LIB	H L	B W Jaya Sri
TUE	MB Prasanthi	MB Prasanthi	English Roja	GAMES	H L	Investment Raju
THU	MB Prasanthi	Minor	English Roja	MB Prasanthi	H L	Investment Raju
FRI	MB Prasanthi	Minor	English Roja	LIB	MI	Games
SAT	Minor	Minor	English Roja	MB Prasanthi	MB Prasanthi	———

SUBJECT wise Faculty								
Faculty	Ms.Roja	Ms.Prasanthi	Ms.Jaya Sri	Mr.Raju		Ms.Lakshmi Devi	Ms. Adilakshmi	
Subject	English	Micro biology	Business Writing	Investment Planning	Minor	Telugu	Hindi	

Class : B.B.A IV SEMESTER FEB 2024						
DAY	1	2	3	4	5	6
MON	Business Law Alekhya	Investment Business Jayasree	MSME Renuka	CMA Divya	Financial services Shanthi	T & D Rebika
TUE	Business Law Alekhya	Investment Business Jayasree	MSME Renuka	CMA Divya	Financial services Shanthi	T & D Rebika
WED	Business Law Alekhya	Investment Business Jayasree	MSME Renuka	CMA Divya	Financial services Shanthi	T & D Rebika
THU	Business Law Alekhya	Investment Business Jayasree	MSME Renuka	LIB	Financial services Shanthi	T & D Rebika
FRI	Business Law Alekhya	Investment Business Jayasree	MSME Renuka	CMA Divya	Financial services Shanthi	T & D Rebika
SAT	Investment Business Jayasree	MI	Financial services Shanthi	CMA Divya	Games	----

Class : Computer Science (Major) II SEMESTER – 2024, FEB

DAY	1	2	3	4	5	6
MON	Minor	Minor	D.L.D Sharina	Investment Raju	English Roja	Investment Raju
TUE	D.L.D Sharina	Programming in C Shanti Rani	Investment Raju	H L	English Roja	Programming in C Shanti Rani
WED	D.L.D Sharina	Programming in C Shanti Rani	B W Jaya Sri	H L	English Roja	Programming in C Shanti Rani
THU	D.L.D Sharina	Minor	B W Jaya Sri	H L	English Roja	Programming in C Shanti Rani
FRI	D.L.D Sharina	Minor	B W Jaya Sri	Lib	MI	Programming in C Shanti Rani
SAT	Minor	Minor	D.L.D Sharina	Games	English Roja	------

SUBJECT wise Faculty

Faculty	Ms.Sharina	Ms.Shanti Rani	Ms.Roja	Ms.Jaya Sri	Raju		Lakshmi Devi	Adilakshmi
Subject	Digital Logic Design	Programming in C	English	Business Writing	Investment Planning	Minor	Telugu	Hindi

Class : Botany (Major) II SEMESTER – 2024, FEB

DAY	1	2	3	4	5	6
MON	Minor	Minor	English Roja	Botany Adiseshu	Botany Adiseshu	B W Jaya Sri
TUE	LIB	Botany Adiseshu	English Roja	Botany Adiseshu	H L	B W Jaya Sri
WED	PLANT PROPAGATION PROJECT ADI SESHU	Botany Adiseshu	English Roja	Botany Adiseshu	H L	Investment Raju
THU	BOTANY ADI SESHU	Minor	English Roja	Botany Adiseshu	H L	Investment Raju
FRI	BOTANY ADI SESHU	Minor	English Roja	Botany Adiseshu	MI	Games
SAT	Minor	Minor	English Roja	Botany Adiseshu	Botany Adiseshu	------

SUBJECT wise Faculty

Faculty		Mrs.Roja	Dr.Adisheshu	Mrs.Jaya Sri	Mr.Raju		Ms.Lakshmi Devi	Ms.Adilakshmi
Subject		English	Botany	Business Writing	Investment Planning	Minor	Telugu	Hindi

Class : Microbiology (Major) II SEMESTER – 2024, FEB

DAY	1	2	3	4	5	6
MON	Minor	Minor	English Roja	MB Prasanthi	Creative Work Lakshmi Devi	B W Jaya Sri
WED	MB Prasanthi	MB Prasanthi	English Roja	LIB	H L	B W Jaya Sri
TUE	MB Prasanthi	MB Prasanthi	English Roja	GAMES	H L	Investment Raju
THU	MB Prasanthi	Minor	English Roja	MB Prasanthi	H L	Investment Raju
FRI	MB Prasanthi	Minor	English Roja	LIB	MI	Games
SAT	Minor	Minor	English Roja	MB Prasanthi	MB Prasanthi	------

SUBJECT wise Faculty

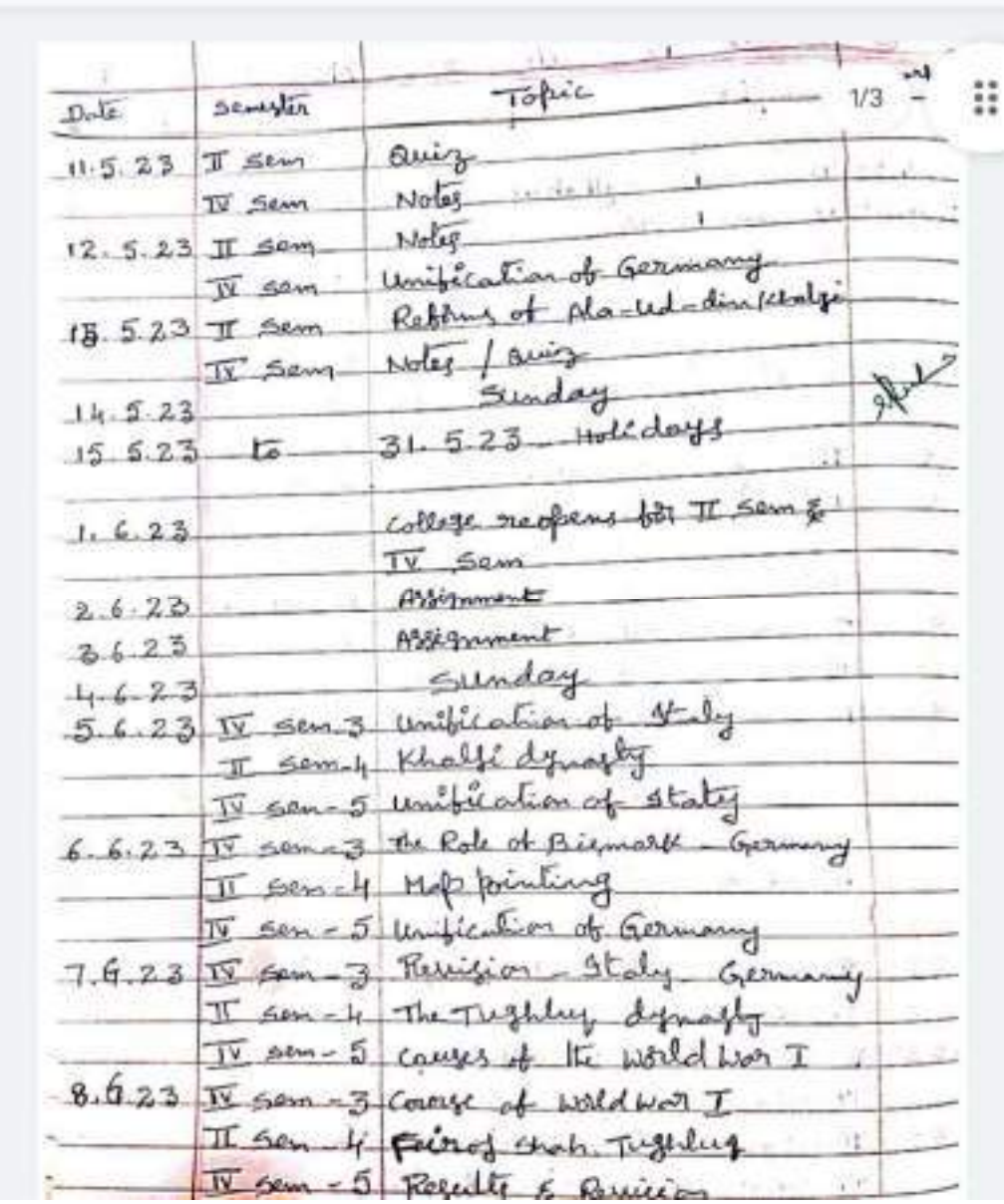
Faculty		Ms.Roja	Ms.Prasanthi	Ms.Jaya Sri	Mr.Raju		Ms.Lakshmi Devi	Ms. Adilakshmi
Subject		English	Micro biology	Business Writing	Investment Planning	Minor	Telugu	Hindi

Class : MPC IV SEMESTER FEB 2024						
DAY	1	2	3	4	5	6
MON	Physics	Maths Sunitha	Physics	Chemistry Valisha	Chemistry Valisha	Maths Manjula
TUE	Physics	Maths Sunitha	Physics	Chemistry Valisha	Chemistry Valisha	Maths Manjula
WED	Physics	Maths Sunitha	Physics	Games	Chemistry Valisha	Maths Manjula
THU	Physics	Maths Sunitha	Physics	Chemistry Valisha	Chemistry Valisha	Maths Manjula
FRI	Physics	Maths Sunitha	Physics	Chemistry Valisha	Chemistry Valisha	Maths Manjula
SAT	Physics	MI	Maths Sunitha	Chemistry Valisha	Chemistry Valisha	----

Class : MPCS IV SEMESTER FEB 2024						
DAY	1	2	3	4	5	6
MON	Physics	Maths Sunitha	Physics	Computer Science Maha lakshmi	Computer Science Shanthi Rani	Maths Manjula
TUE	Physics	Maths Sunitha	Physics	Computer Science Maha lakshmi	Computer Science Shanthi Rani	Maths Manjula
WED	Physics	Maths Sunitha	Physics	Computer Science Maha lakshmi	Computer Science Shanthi Rani	Maths Manjula
THU	Physics	Maths Sunitha	Physics	Computer Science Maha lakshmi	Computer Science Shanthi Rani	Maths Manjula
FRI	Physics	Maths Sunitha	Physics	Computer Science Maha lakshmi	Computer Science Shanthi Rani	Maths Manjula
SAT	Physics	MI	Maths Sunitha	Computer Science Maha lakshmi	Games	----

DOCUMENT 7
DELIVERY OF CURRICULUM 2023-2024

1. ANNUAL PLAN
DEPARTMENT OF COMMERCE



Date	Semester	Topic
11.5.23	II Sem	Quiz
	IV Sem	Notes
12.5.23	II Sem	Notes
	IV Sem	Unification of Germany
13.5.23	II Sem	Reforms of Ala-Ud-din Khalji
	IV Sem	Notes / Quiz
14.5.23		Sunday
15.5.23	to	31.5.23 Holidays
1.6.23		College reopens for II Sem & IV Sem
2.6.23		Assignment
3.6.23		Assignment
4.6.23		Sunday
5.6.23	IV sem-3	Unification of Italy
	II sem-4	Khalji dynasty
	IV sem-5	Unification of Italy
6.6.23	IV sem-3	The Role of Bismarck - Germany
	II sem-4	Map pointing
	IV sem-5	Unification of Germany
7.6.23	IV sem-3	Revision - Italy Germany
	II sem-4	The Tughlaq dynasty
	IV sem-5	Causes of the World War I
8.6.23	IV sem-3	Course of World War I
	II Sem-4	Feiroj Shah Tughlaq
	IV sem-5	Results & Revision

Date	class / period	Topic	Remarks
20.6.23	IV Sem-3	Advent of Europeans - Andhra	
	II Sem-4	Administration, Society under Vijayanagara	
	IV Sem-5	European Settlements in Andhra	
21.6.23	IV -3	occupation of N. Circars	
	II -4	Notes	
	IV -5	occupation of ceded dists	
22.6.23	IV -3	Religion - N. Circars	
	II -4	cultural development - Vijayanagara	
	IV -5	Assignment	
23.6.23	IV -3	Andhra under British rule	
	II -4	classroom quiz	
	IV -5	Land Revenue Settlement	
24.6.23		No Bag day - activity	
		Map pointing	
25.6.23		Sunday	
26.6.23		O.D - T.S.R TB.K College	
		project work	
27.6.23	IV -3	Impact of Industrial revolution"	
	II -4	student Seminar	
	IV -5	Economy, peasantry & Famines	
28.6.23	IV -3	Sir Thomas Munroe	
	II -4	Emergence of Mughal Empire	
	IV -5	C.I.O an.	
29.6.23	IV -3	Wall- in Andhra	
	II -4		

DEPARTMENT OF HISTORY ANNUAL PLAN 23-24

I B.A HISTORY
Semester – 1

Paper – 1, Ancient Indian History and Culture (from earliest times to 600 A.D)

Title of the lesson	Duration taken to complete the lesson	Objectives of the lesson	Reference material	Assignment	Goals achieved / learning outcomes
Unit 1 – Survey of Sources, influence of Geography on History	6	Facts identification recognize the facts, concepts, show information on maps, charts diagrams.	Text book A.L. Basham The wonder that was India	Quiz	To make learners to identify and define various kinds of sources and understand how history has been shaped
Traces of Stone age cultures	3	Prepare models, tools etc	Internet	Weekly test	
Indus valley civilization – salient features	3	Visit archaeological sites museums, places	You Tube videos	Assignment	Compare and contrast various stages of progress from Indus to vedic age and analyze the Jain and vedic faiths
Unit – 2 Vedic age – society, culture	4	practice the noble religions & their principles	Text book	Classroom discussion	
Religious reform movements Jainism and Buddhism	6		You Tube lessons	Visiting historical places related with	Analyze the comparisons and differences between the religions / Dharmas
Unit – 3 Transition from territorial state to emergence of Empires, Rise of Mahajanapadas	2	To create interest as well as love for reading historical stories, characters, events, facts which are found necessary for solving the present problems effectively.	D.D. Kosambi An Introduction to the study of Ancient History	Assignment	To make the learners to analyze the emergence of the Mauryan empire
b) Causes for Magadha success	4				
c. Persian and			BBC documentaries	Class test	

Macedonian invasions	3				visualize where places are in relation to one another through map pointing
4) Mauryan Empire administration Ashoka's Dhamma, Art & architecture, Significance & Downfall	8 2	Classify facts, events, ideas, concepts etc		Assignment Class test	
Unit - 4 conditions during 200 - 300 A.D Kushanas - polity - culture The age of Satavahanas - Administration	6 9	Global, national and local relationships between societies and people	Internet B.N. Mukherjee, The Rise and fall of the Kushana Empire	Seminar Group discussion	To make learners to Evaluate the key facts of the ancient society, polity and culture
culture - developments Sangam age: The three early Kingdoms - Society - Literature Unit - 5 The Rise and Growth of Guptas - Polity - Religion - Art - literature and Science & technology - Decline	6 12	To observe the development of achievements in Science, Engineering, art, dialectics, literature, logic, maths, astronomy, medicine and Philosophy	Text book	Class test Assignment Seminar class test	To make learners to Analyze the emergence of the Gupta empire during the 'classical age' in India

Picture saved

DEPARTMENT OF MATHEMATICS ANNUAL PLAN 2023-2024

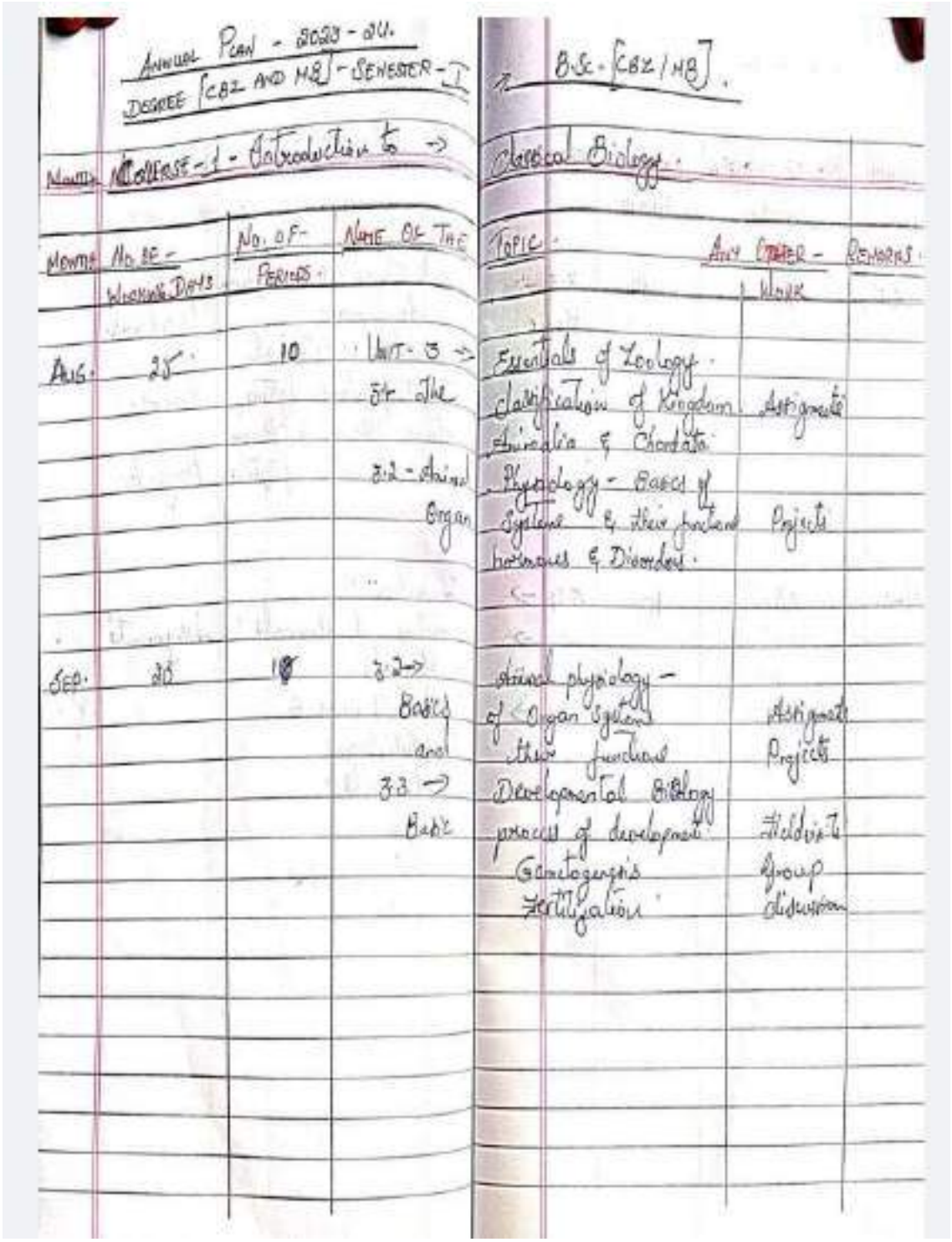
GROUP THEORY

B.S.C - 3rd Semester
(Major & Minor)
Annual plan for 2024-2025

No	Month	No. of working Days	Periods	TOPIC	Assignments	Suggested Activities
	August	18 days	12 hrs	UNIT - I : Groups Binary operations, Algebraic structure, semigroup, Monoid, group definations & finite & infinite groups, examples & order of a group	Class Test on Groups & Problems	Collecting the definition of Groups
2.	September	10 days	12 hrs	UNIT - II : Sub groups Complex definations, multiplication of two complexes, inverse of a complex subgroup definations, Examples, Criterion for a complex to be subgroups, Product of two subgroups of a group is again a subgroup & Union, intersection of subgroups.	Class Test on Cayley's Hamilton theorem	
3.	September	25 days	24 hrs.	UNIT - III : Normal Subgroups definition of Normal subgroup, Simple & Proper subgroups, Hamilton groups, Criterion for a subgroup..	Conducted seminar on group	

				subgroups to be a normal subgroup. union & intersection of two normal subgroups.		
4.	october	22 days	12 hrs	UNIT - IV :- Homomorphism. Def. of Homomorphism. Image of homomorphism elementary properties of homomorphism, Isomorphism, automorphism, definitions & kernel of homomorphism, fundamental theorem on Homomorphism and applications	Class Test on Homomorphism	PPT presentation
5.	october	19 days	12 hrs	UNIT - V :- Permutations and cyclic groups. Def. of permutation, permutation multiplication, Inverse of a permutation cyclic permutation, even, odd permutations applications cayley's theorem. Cyclic groups :- Def & elementary properties, classification of cyclic groups.	Problem solved permutation group	

DEPARTMENT OF ZOOLOGY ANNUAL PLAN 2023-2024



Annual Plan - 2023 - 24.
Degree [CBZ and MB] - Semester - I
Month: Course - 1 - Introduction to →

Month	No. of Working Days	No. of Periods	Name of the Unit
Aug.	25	10	Unit - 3 → 3.1 The 3.2 - Animal Organ
Sep.	20	18	3.2 → Basic and 3.3 → Basic

B.Sc. [CBZ / MB].
Classical Biology.

Topic	Any Other - Work	Remarks
Essentials of Zoology. Classification of Kingdom Animalia & Chordata. Physiology - Basic of System & their function hormones & Disorders.	Assignment Projects	
Animal physiology - of Organ System their function Developmental Biology process of development Gametogenesis Fertilization.	Assignment Projects Field visit Group discussion	

Month	No. of Working Days.	No. of Periods	Name of the Topic.	Any Other Work.	Remarks.
Oct	21	10	3.3 → Basic →	Developmental Biology process of development Gametogenesis, Fertilization Cleavage Organogenesis.	Assignments Projects Digital Class.
Nov.	23.	10.	3.4 → → → →	Economic Zoology. Sericulture Apiculture Aquaculture	Projects Field visits group discussion.

2. DEPARTMENTAL CALENDAR 2024

DEPARTMENT OF HISTORY

Department of History

Annual activities Diary

July 2024 - Feb 2025

1-8-2024 — Student Seminar on Pingali Venkaiah Indian Flag designer

14-8-2024 — Women Empowerment day in Collaboration with Dept of English

27-9-2024 — World Tourism day - Historical field visit

7-10-2024 — World Cotton Day

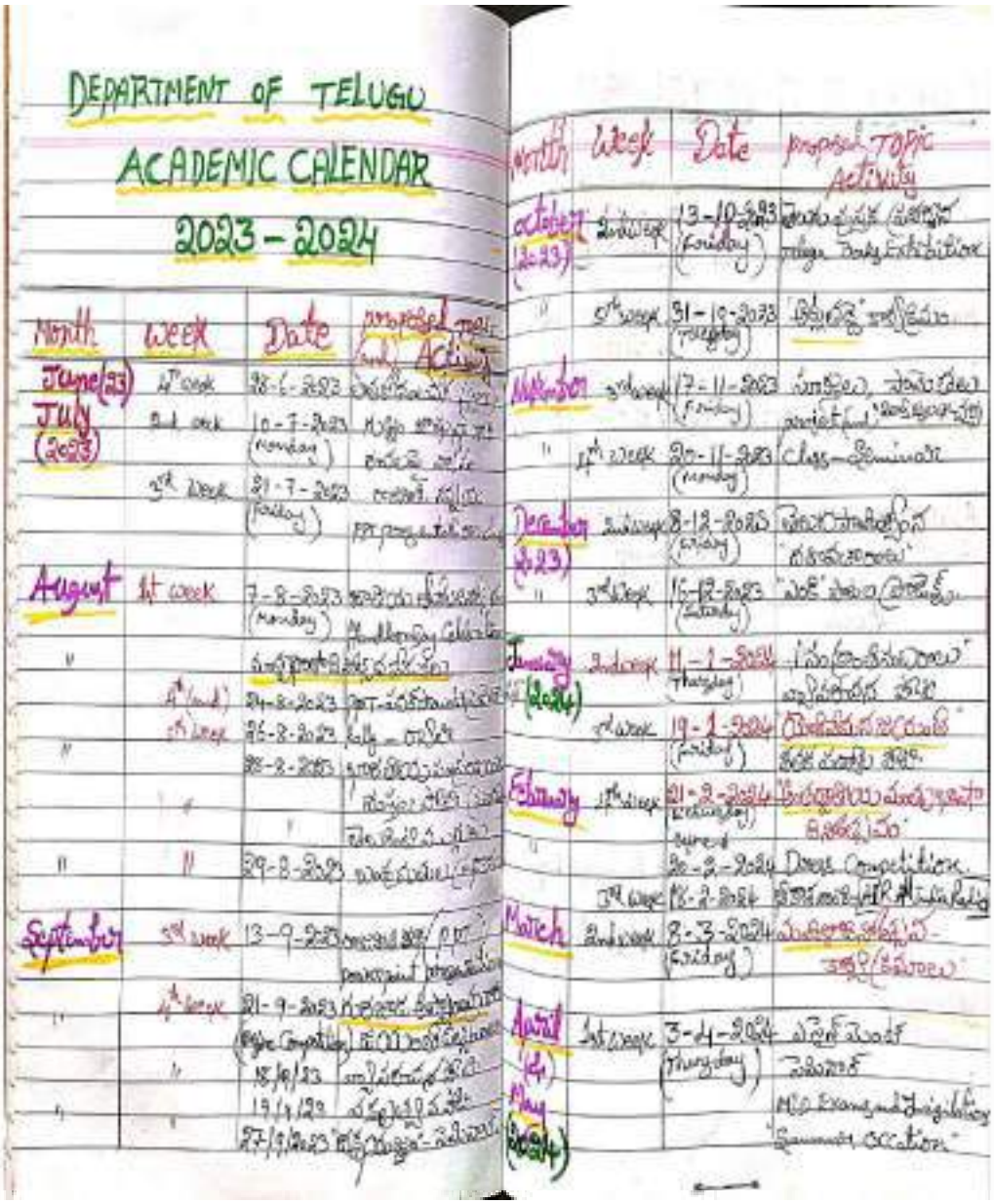
5.12.2024 — World Soil day in collaboration with Dept of Botany

9-1-2024 — pravasi Bhartiya Divas Student talk on Gandhiji

30.1-2024 — Martyrs Day of Shaheed Diwas

G. Lalitha
Dept of History

DEPARTMENT OF TELUGU CALENDAR 2024



DEPARTMENT OF TELUGU

ACADEMIC CALENDAR

2023 – 2024

Month	Week	Date	proposed topic / Activity
June(23)	4th week	28-6-2023	
July (2023)	2nd week	10-7-2023 (Monday)	
	3rd week	21-7-2023 (Friday)	
August	1st week	7-8-2023 (Monday)	
	4th week	24-8-2023	
	5th week	26-8-2023	
		28-8-2023	
		29-8-2023	
September	3rd week	13-9-2023	
	4th week	21-9-2023	
		18/9/23	
		19/9/23	
		27/9/2023	

Month	Week	Date	proposed topic / Activity
October (2023)	2nd week	13-10-2023 (Friday)	
	5th week	31-10-2023 (Tuesday)	
November	3rd week	17-11-2023 (Friday)	
	4th week	27-11-2023 (Monday)	Class-Seminar
December (2023)	2nd week	8-12-2023 (Friday)	
	3rd week	16-12-2023 (Saturday)	
January (2024)	2nd week	11-1-2024 (Thursday)	
	4th week	19-1-2024 (Friday)	
February	1st week	21-2-2024 (Wednesday)	
		26-2-2024	Dance Competition.
	3rd week	16-2-2024	
March	2nd week	8-3-2024 (Friday)	
April (24) May (2024)	1st week	3-4-2024 (Thursday)	

3. TEACHING DIARY 2023-2024

TELUGU TEACHING DIARY

NOVEMBER = 2023

01-11-2023 Wednesday	9:20 - 9:50 2nd hrs	Sem-3 MPC	MID - I Exam Invigilation
11	11:30 - 12:00 pm. 4th hrs.	1st years (All) Invigilation	Aditorium.
11	12 to 12:45 5th hrs	Sem-I All first years	Revision - Stay tuned.
11	12:45 to 1:30 and 6th hrs Continue 2:20pm.	Sem-3 2nd years All.	G.D. Babu. Topic Seminar in Aditorium.
2-11-2023 Thursday.	11:10 to 12:00 pm. 4th hrs	MSCS/1st MPC General class	General to Topic motivation class

Date	Time & Hour	Class	Topic Covered
2-11-23 Thursday.	12 to 12:45 5th hrs	1st years All groups	అలంకారాలు. శబ్దాలంకారాలు-Notes
principal Sr. prema Birthday Celebrations			
3-11-23 Friday.	9:20 – 9:50 2nd hrs	2nd year 3rd-Sem MPC / MPCS	Unit-II-సృజనాత్మక రచన ఉత్తమ కవిత-లక్షణాలు
11	12:45 – 1:30 6th hrs	Sem-3 All groups.	issue MID-I papers. ఉత్తమ కవిత-లక్షణాలు
4-11-23 Saturday	11 to 11:45 4th hrs	2nd B.A 3rd-Sem	Motivation class General Topic.
5/11/23 ← Sunday →			
			Jaya Sri 07/11
6/11/23 Monday.	9:20-9:50 2nd hrs	Sem-III MPC/MPCS ~~BBA~~	వాక్యం-నిర్వచనం-వాక్యభేదం సామాన్యవాక్యాలు సంశ్లిష్ట. సంయుక్త
11	12:45-1:30	2nd year Sem-III All groups.	Sr. prema (Short meeting) సామాన్యవాక్యాలు - సంశ్లిష్ట, సంయుక్తవాక్యాలు
7-11-23 Tuesday ← Leave →			
8-11-23 Wednesday	9:20-9:50 2nd hrs	2nd year Sem-III MPC/MPCS/BBA	మాధ్యమాలు ప్రింట్ మీడియా ఎలక్ట్రా మాధ్యమం.

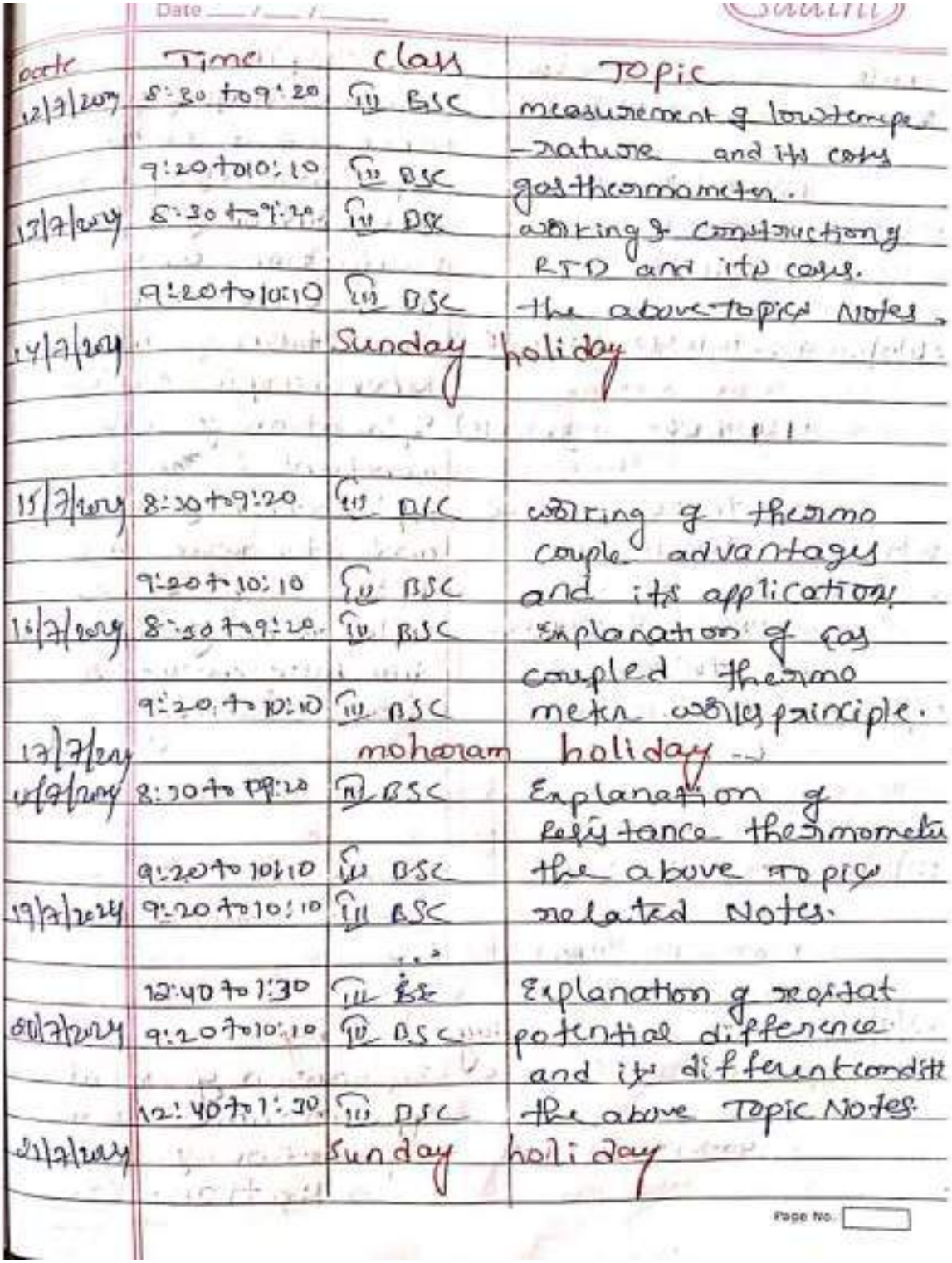
TEACHING DIARY OF HISTORY DEPARTMENT 2024

Date	class | period	Topic	Remarks
20.6.23	IV Sem – 3	Advent of Europeans – Andhra	
	II Sem – 4	Administration, Society under Vijayanagara	
	IV Sem – 5	European settlements in Andhra	
21.6.23	IV – 3	occupation of N. Circars	
	II – 4	Notes	
	IV – 5	occupation of ceded dists	
22.6.23	IV – 3	Revision – N. Circars	
	II – 4	cultural development – Vijayanagara	
	IV – 5	Assignment	
23.6.23	IV – 3	Andhra under British rule	
	II – 4	classroom quiz	
	IV – 5	Land Revenue Settlement	
24.6.23		No Bag day – activity	
		Map pointing	
25.6.23		Sunday	
26.6.23		O.D – T.S.R T.B.K College	
		project work	
27.6.23	IV – 3	Impact of Industrial revolution"	
	II – 4	student Seminar	
	IV – 5	Economy, peasantry & Famines	
28.6.23	IV – 3	Sir Thomas Munroe	
	II – 4	Emergence of Mughal Empire	
	IV – 5	C.P. Brown	
29.6.23	IV – 3	Impact of 1857 Revolt in Andhra	
	II – 4	Babur	

Date	sem / period	Topic	Remarks
9.6.23	IV Sem-3	League of Nations	
	II Sem-4	Sayyed and Lodi dynasties	
	IV Sem-5	Map pointing to Religion	
10.6.23		Second Saturday	
11.6.23		Sunday	
12.6.23	IV Sem-3	Italy - Fascism	12.6.23
	II sem-4	Administration of Delhi Sultans	
	IV sem-5	Mussolini - Fascist party	
13.6.23	IV Sem-3	Religion - Fascism	
	II -4	Religion & culture of Delhi sultanate	
	IV -5	Hitler - Nazism	
14.6.23	IV -3	History of Hitler	
	II -4	Impact of Islam on Hindu Society	
	IV -5	World War-II causes	
15.6.23	IV -3	World war-II Course	
	II -4	Bhakti Movement	
	IV -5	World War II - Results	
16.6.23	IV -3	Revision Unit Test - Mid-I	
	II -4	Unit test	
	IV -5	U.N.O	
17.6.23	IV -3	Success and failures of U.N.O	
	II -4	Unit test	
	IV -5	Introduction of A.P Geography	
18.6.23		Sunday	
19.6.23	IV -3	Qutb Shahis	
	II -4	Sufi movement	
	IV -5	Qutb shahis - Culture	

Date	semester	Topic	Remarks
11.5.23	II sem	Quiz	
	IV Sem	Notes	
12.5.23	II sem	Notes	
	IV sem	Unification of Germany	
13.5.23	II Sem	Reforms of Ala-ud-din Khalji	
	IV Sem	Notes / Quiz	
14.5.23		Sunday	
15.5.23	to	31.5.23 Holidays	
1.6.23		College reopens for II Sem & IV Sem	
2.6.23		Assignment	
3.6.23		Assignment	
4.6.23		Sunday	
5.6.23	IV sem-3	Unification of Italy	
	II sem-4	Khalji dynasty	
	IV sem-5	Unification of Italy	
6.6.23	IV sem-3	The Role of Bismark - Germany	
	II sem-4	Map pointing	
	IV sem-5	Unification of Germany	
7.6.23	IV sem-3	Revision - Italy Germany	
	II sem-4	The Tughlug dynasty	
	IV sem-5	causes of the World War I	
8.6.23	IV sem-3	Course of World War I	
	II Sem-4	Feiroj Shah Tughlug	
	IV sem-5	Results & Revision	

TEACHING DIARY PHYSICS DEPARTMENT 2024



Date	Time	class	Topic
12/7/2024	8:30 to 9:20	III BSC	measurement of low temperature and its units
	9:20 to 10:10	III BSC	gas thermometer.
13/7/2024	8:30 to 9:20	III BSC	working & Construction of RTD and its uses.
	9:20 to 10:10	III BSC	the above topics Notes.
14/7/2024		Sunday	holiday
15/7/2024	8:30 to 9:20	III BSC	working of thermo couple advantages
	9:20 to 10:10	III BSC	and its applications
16/7/2024	8:30 to 9:20	III BSC	Explanation of Gas coupled thermo
	9:20 to 10:10	III BSC	meter working principle.
17/7/2024		mohoram	holiday
18/7/2024	8:30 to 9:20	III BSC	Explanation of resistance thermometer
	9:20 to 10:10	III BSC	the above topics
19/7/2024	9:20 to 10:10	III BSC	related Notes.
	12:40 to 1:30	III BSC	Explanation of resistat
20/7/2024	9:20 to 10:10	III BSC	potential difference and its different condition
	12:40 to 1:30	III BSC	the above Topic Notes.
21/7/2024		Sunday	holiday

Page No.

Date ___/___/___

date	Time	class	Topic
1/7/2024	8:30 to 9:20	III BSC	Explanation of semester and Internship programme
	9:20 to 10:10	III BSC	Orientation class.
2/7/2024	8:30 to 9:20	III BSC	Conducting departmental activity
	9:20 to 10:10	III BSC	Students prepared different activities and observed.
3/7/2024	8:30 to 9:20	III BSC	
	9:20 to 10:10	III BSC	Explanation of low temperature
4/7/2024		S.F.I	bundh
5/7/2024	8:30 to 9:20	III BSC	Explanation of regenerative cooling
	9:20 to 10:10	III BSC	Joule thomson effect.
6/7/2024	8:30 to 9:20	III BSC	Liquification of helium air liquification super
	9:20 to 10:10	III BSC	conductivity.
7/7/2024		Sunday. holiday.	
8/7/2024	8:30 to 9:20	III BSC	Expression for Joule thomson co-efficient
	9:20 to 10:10	III BSC	and its cases.
9/7/2024	8:30 to 9:20	III BSC	adiabatic demagnetization and its cases
	9:20 to 10:10	III BSC	the above topic Notes.
10/7/2024	8:30 to 9:20	III BSC	liquification air and its cases.
	9:20 to 10:10	III BSC	the above topic Note
11/7/2024	8:30 to 9:20	III BSC	liquification of hydrogen & its cases.

Page No.

Date ___/___/___

date	Time	class	Topic
18/6/2024	9:20 to 10:10	I BSc	revission of michelson morley Experiment.
	10:20 to 11:10	I BSc	conducting Exam in Gauss divergence theorem.
19/6/2024	9:20 to 10:10	I BSc	revising Einsteinmass Energy relation.
	10:20 to 11:10	I BSc	revission of lengthcontraction
20/6/2024	9:20 to 10:10	I BSc	revising kepler's IST and 2nd law.
	10:20 to 11:10	I BSc	Conduct the Exam.
21/6/2024	9:20 to 10:10	I BSc	revission of Lorentz Transformation Equation.
	10:20 to 11:10	I BSc	revising Stokytheorem
22/6/2024	9:20 to 10:10	I BSc	Conduct the Examination
	10:20 to 11:10	I BSc	and above Topic revission kepler's IST law Exam.
23/6/2024	Sunday holiday.		
24/6/2024	10:20 to 12:00	I BSc	revission of damped oscillation and forced oscillation.
25/6/2024	10:20 to 12:00	I BSc	Conduct the assignment.
26/6/2024	10:20 to 12:00	I BSc	revission of ultrasonics and applications.
27/6/2024	10:20 to 12:00	I BSc	revission of pizo Electric effect and its cases
28/6/2024	10:20 to 12:00	I BSc	magneto striction method and its cases.
29/6/2024	10:20 to 12:00	I BSc	Conduct the Exam 29/6/24

Date __/__/__

Date	Time	class	Topic
22/2/2024	9:20 to 10:10	III BSC	Basic concept of solar Energy & its Calc.
	12:40 to 1:30	II BSC	Explanation of spectral
23/7/2024	9:20 to 10:10	II BSC	distribution of solar
	12:40 to 1:30	II BSC	radiation and
			ultra voilet ABC
24/7/2024	9:20 to 10:10	III BSC	conditions and all
			above topic Notes.
	11:10 to 12:00	IV (BSC)	Explanation of solar
			constant & zenith angle
	12:40 to 1:30	III BSC	Explanation of Air mass
25/7/2024	9:20 to 10:10		and standard Time.
			Feast celebrations.
	11:10 to 12:00	I BSC	Explanation of deffinitions
	12:40 to 1:30		in basic concepts.
26/7/2024	9:20 to 10:10		feast holiday
27/7/2024	8:30 to 9:20	II BSC	students went for
	9:20 to 10:10	II BSC	semister Exams.
28/7/2024		Sunday	holiday
29/7/2024	9:20 to 10:10	III BSC	Explanation of local
	12:40 to 1:30	II BSC	apparent time and
			Explanation of diffuse
			radiation.

Page No.

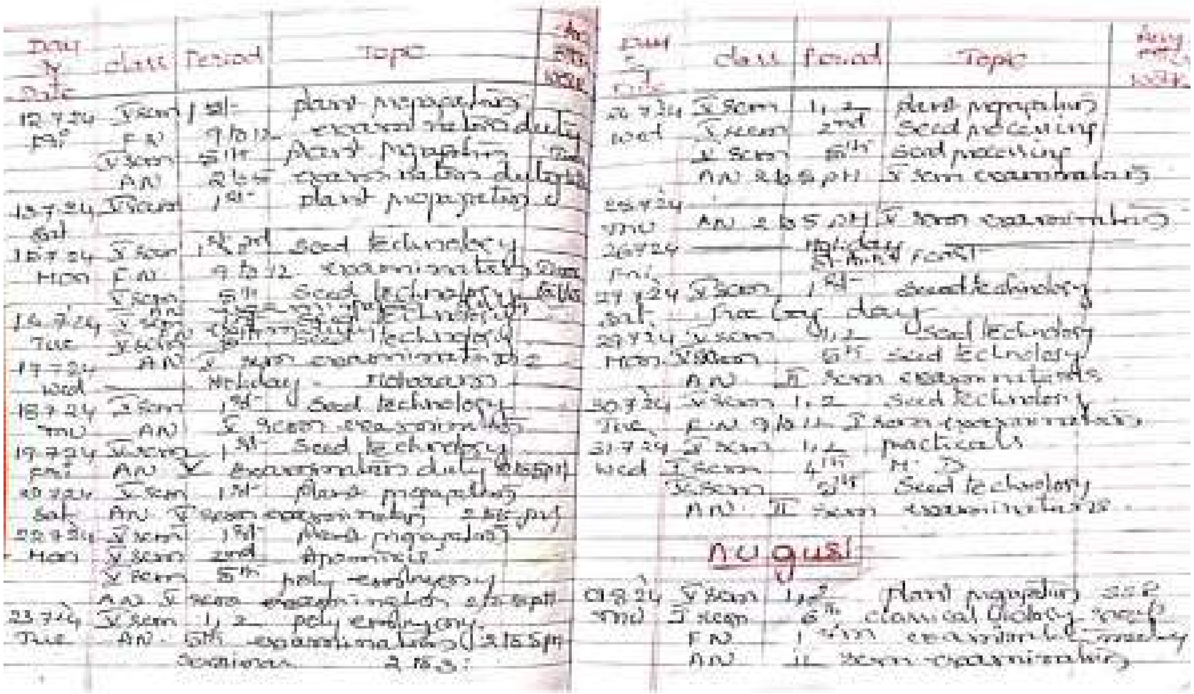
MATHEMATICS TEACHING DIARY 2024

MATHEMATICS TEACHING DIARY 2024

Date	Time	Class/Group	Topic
30/08/24	1st Period	3rd B.Sc	→ [illegible]
	2nd Period	2nd B.Sc (MATH)	→ [illegible]
	3rd Period	" (MATH)	} [illegible] Test
	5th Period	" (MATH)	
31/08/24	attended BOS Meeting		
01/09/24	Sunday		
02/09/24	1st Period	3rd B.Sc	→ Problems on N.F.T
	2nd Period	2nd B.Sc (MATH)	→ Newton's [illegible]
	3rd Period	" (MATH)	} [illegible] of a [illegible]
	5th Period	" (MATH)	
03/09/24	1st Period	3rd B.Sc	Test [illegible]
	2nd Period	2nd B.Sc (MATH)	→ Newton Divid. Difference [illegible]
	3rd Period	" (MATH)	} ab = ac ⇒ b = c, ba = ca ⇒ b = c
	5th Period	" (MATH)	
04/09/24	1st Period	3rd B.Sc	→ Test on Gauss [illegible]
	2nd Period	2nd B.Sc (MATH)	→ Gauss Back[illegible]
	3rd Period	" (MATH)	} doubts clarification
	5th Period	" (")	
05/09/24	Teacher's Day celebrations		

Date	Time	Class/Group	Topic
06/09/24	1st Period	3rd B.Sc	→ Theorem on N.D.D.F
	2nd Period	2nd B.Sc (MATH)	→ [illegible]
	3rd Period	" (MATH)	} [illegible] of left cancellation laws, R.C.L
	5th Period	" (MATH)	
07/09/24	Vinayaka Chavithi		
08/09/24	Holiday (Sunday)		
09/09/24	1st Period	3rd B.Sc	→ Table [illegible]
	2nd Period	2nd B.Sc (MATH)	→ Forward diff[illegible]
	3rd Period	" (MATH)	} [illegible]
	5th Period	" (MATH)	
10/09/24	1st Period	3rd B.Sc	5th unit exam
	2nd Period	2nd B.Sc (MATH)	
	3rd Period	" (MATH)	} (1) Theorem on $O(a) = O(a^{-1})$ (2) $O(a) \leq O(G)$
	5th Period	" (MATH)	
11/09/24	1st Period	3rd B.Sc	[illegible] Maximum
	2nd Period	2nd B.Sc (MATH)	Symbolic [illegible]
	3rd Period	2nd B.Sc (MATH)	Theorem on [illegible]
	5th Period	2nd B.Sc (MATH)	Symbolic [illegible]
12/09/24	1st Period	3rd B.Sc	[illegible] Minimum [illegible]
	2nd Period	2nd B.Sc (MATH)	[illegible]
	3rd Period	2nd B.Sc (MATH)	Subgroups
	5th Period	2nd B.Sc (MATH)	[illegible]

BOTANY TEACHING DIARY 2024



Day & Date	Class	Period	Topic
12.7.24 Fri	V sem	1st	plant propagation
	FN	9 to 12	[illegible] duty
	V sem	5th	plant propagation
	AN	2 to 5	examination duty
13.7.24 Sat	V sem	1st	plant propagation
15.7.24 Mon	V sem	1st, 2nd	seed technology
	FN	9 to 12	examination duty
	V sem	5th	seed technology
16.7.24 Tue	V sem	[illegible]	seed technology
	V sem	[illegible]	seed technology
	AN		I sem examination duty
17.7.24 Wed			Holiday - Moharram
18.7.24 Thu	V sem	1st	seed technology
	AN		I sem examination
19.7.24 Fri	V sem	1st	seed technology
	AN		V examination duty [illegible]
20.7.24 Sat	V sem	1st	plant propagation
	AN		V sem examination 2 to 5 pm
22.7.24 Mon	V sem	1st	plant propagation
	V sem	2nd	Apomixis
	V sem	5th	poly embryony
	AN		V sem examination 2 to 5 pm
23.7.24 Tue	V sem	1, 2	poly embryony
	AN	5th	examination (2.15 pm)
			seminar 2.15 [?]
24.7.24 Wed	V sem	1, 2	plant propagation
	I sem	2nd	seed processing
	V sem	5th	seed processing
	AN	2 to 5 pm	I sem examination
25.7.24 Thu	AN	2 to 5 pm	I sem examination
26.7.24 Fri			Holiday St. Anne's Feast [?]
27.7.24 Sat	V sem	1st	seed technology
			Tree day [?]
29.7.24 Mon	V sem	1, 2	seed technology
	V sem	5th	seed technology
	AN		II sem examination
30.7.24 Tue	V sem	1, 2	seed technology
	FN	9 to 12	I sem examination
31.7.24 Wed	V sem	1, 2	practicals
	I sem	4th	M. D
	V sem	5th	seed technology
	AN		II sem examination
August			
01.8.24 Thu	V sem	1, 2	plant propagation [illegible]
	I sem	6th	classical biology [illegible]
	FN		I sem examination [illegible]
	AN		II sem examination

Day Date	class	Period	Topic
02.8.24 Fri	V Sem	1st	Plant propagation
	III Sem	4th	Taxonomy
	I Sem	examination 9 to 12	
	I Sem	6th	Taxonomy
	II Sem	examination 2 to 3.30	
03.8.24 Sat	V Sem	1st	Plant cuttings
	I Sem	4th	Nomenclature
	F.N I Sem	examination	
	A.N. IV Sem	examination	
05.8.24 Mon	V Sem	1, 2,	plant propagation practical
	V, I Sem	3, 5th	Seed technology
	I Sem	examination 9 to 1 AM	
06.8.24 Tue	V Sem	1, 2	Seed technology
	II Sem	examination AN	
07.8.24, 08.8.24, 9.8.24. — C.L —			
10.8.24. — Second Saturday —			
12.8.24 Mon	V Sem	1, 2	plant propagation
	III Sem	3rd	Syllabus
	V Sem	5th	Seed technology
13.8.24 Tue	V Sem	1, 2	Seed technology
	III Sem	3rd	pteridophyta
14.8.24 wed	V Sem	1, 2	Seed technology
	III Sem	3rd	pteridophyta
15.8.24 Thu	—	Independence day	

4. Consolidated Internal Assesment – 2024

Department of Telugu

2nd BBA sec 2023

Sl.no	Names	MID I						
1.	A. Firdous	20	50	70	12	5	4	21
2.	A. Radhika	22	54	76	12	6	5	23
3.	G. Gnani	22	43	64	11	4	5	20
4.	G. Chandana priyanka	19	32	51	11	4	5	20
5.	K. Bhagyasri	24	68	92	14	5	5	24
6.	CH. Ramya	22	53	75	12	4	4	20
7.	B. [illegible]	-						
8.	S. Harshitha	20	58	78	12	4	5	21
9.	S. Manjula	23	55	78	12	5	5	22
10.	T. Sujatha Sujaya	-	-	-				
11.	U. Bhagyalaxmi	18	30	48	8	5	4	17

total :- 10 09
present :- 09 09
Absent :- Nil
pass percentage :- 100%

2nd - MPC and MPCS - 2023

Sl.no	Names	MID I	MID II					
	MPC							
1.	A. Lahitha	22	62	84	13	5	5	23
2.	B. Jyothi	22	62	84	13	4	5	22
3.	J. Chandrika	21	60	81	13	4	5	21
4.	P. Lahitha	24	68	92	14	5	5	24
5.	G. Manasa	22	59	81	13	5	5	23
6.	M. Rajeswari	20	66	86	13	4	4	21
	MPCS							
1.	A. Pridhvi	24	67	91	14	5	5	24
2.	B. Tulasi latha	22	58	77	12	4	5	21
3.	B. Vasanthi	22	60	82	13	5	5	23
4.	B. Nanja Sai	19	47	66	11	5	4	20
5.	D. Sujathi	22	68	90	13	5	5	23
6.	D. Mythili	20	60	80	13	4	5	22
7.	CH. Lahitha	23	50	73	11	4	5	20
8.	D. Sai Lasya	24	67	91	14	5	5	24
9.	G. Keerthana	22	58	94	11	4	5	20
10.	G. pujitha	21	60	81	12	4	4	20
11.	J. palani	21	66	87	13	4	5	22
12.	K. vasantha	20	50	70	12	5	5	22
13.	K. lahitha priyanka	24	66	90	14	5	5	24
14.	K. Hemalatha	22	66	88	13	5	5	23
15.	K. Anuradha	23	70	93	14	5	5	24
16.	K. Madhavi	21	69	78	12	4	5	21
17.	L. mahalakshmi	20	58	78	12	5	4	21
18.	M. Sree Sruthi Gayathri	22	61	83	13	5	4	22

Sl.no	Names	MID I	MID II					
19.	M. Ramani	22	57	79	12	5	4	21
20.	N. Puja	22	55	77	12	4	5	21
21.	R. Prasillika	23	60	83	13	5	5	23
22.	S. Sathanai	19	63	82	13	5	5	23
23.	T. Harshitha	20	35	55	10	4	5	19
24.	T. Geethanjali	24	63	87	13	5	5	23
25.	V. Shanji	20	30	50	10	4	4	18
26.	Y. Pavya	23	65	88	13	5	5	23

1. mpc total :- 5 Absent :- Nil
present :- 5 pass percentage :- 100%
2. MPCS total :- 26
mpcs present :- 26
Absent :- nil
pass percentage :- 100%

2nd - MSCS - 3rd Sem - 2023

Sl.no	Names	MID I	MID II					
1.	A. Nanditha	22	39	61	11	5	4	20
2.	D. Puja	22	59	81	12	5	5	22
3.	G. Geethanjali	14	30	44	8	4	4	16
4.	G. Balamani	23	56	79	12	5	5	22
5.	G. Sowritha	22	66	88	13	5	5	23
6.	K. Manga Sai	23	54	77	12	5	5	22
7.	K. Mythili	21	47	68	10	5	4	19
8.	M. Sydhara Devi	14	33	47	8	5	4	17
9.	M. Yashodha	21	61	82	10	5	5	23
10.	M. Raja	21	30	51	8	4	4	16
11.	N. Nagarjuna	21	58	79	12	5	4	21
12.	P. Prathima	23	44	67	10	4	4	18
13.	P. Manjula	16	37	53	9	5	4	18
14.	P. Nirmala	14	36	50	9	5	4	18
15.	P. Manjula	20	55	75	12	5	5	22
16.	T. Gnani	22	61	94	13	5	5	23
17.	S. Amrithasai	15	26	71	11	5	4	20

total :- 17
present :- 17
Absent :- nil
pass percentage :- 100%

2nd CBZ Sem-3 2023

Sl. No	Names	MID I	MID II	Total	[illegible]	[illegible]	[illegible]	[illegible]
1	D. Padmavathi	22	47	69	11	5	4	20
2	G. Pavani	22	62	84	13	5	5	[illegible]
3	G. Nithanyasritha	22	55	77	12	5	4	[illegible]
4	K. Yathoosha Devi	20	59	79	12	5	5	[illegible]
5	K. Navya Sree	21	50	71	11	4	5	[illegible]
6 left	M. Manikanteswari	—	—	—	—	—	—	—
7	M. Durga Mounika	23	58	81	12	5	5	[illegible]
8	M. Praveena	22	48	70	11	5	4	[illegible]
9 left	[illegible] Divya	—	—	—	—	—	—	—
10	P. Ankitha	20	62	82	12	5	5	[illegible]
11	S. Tulasi	22	42	64	10	5	5	[illegible]
12	S. Susmitha [illegible]	20	58	78	12	5	5	[illegible]
13	S. Revathi	22	66	88	13	5	5	[illegible]
14	S. Anjali	22	61	83	13	5	5	[illegible]
15 left	T. Jahnavi	—	—	—	—	—	—	—
16	V. Madhuri	20	53	73	11	5	4	[illegible]
17	P. Divya	22	60	82	12	5	5	[illegible]
18 left	Y. Sandhya	21	Ab	—	—	[illegible]	[illegible]	[illegible]

Total :- 17+1=18 , left → 03+1 [illegible]
present :- 14
Absent :-
pass percentage :- 100%

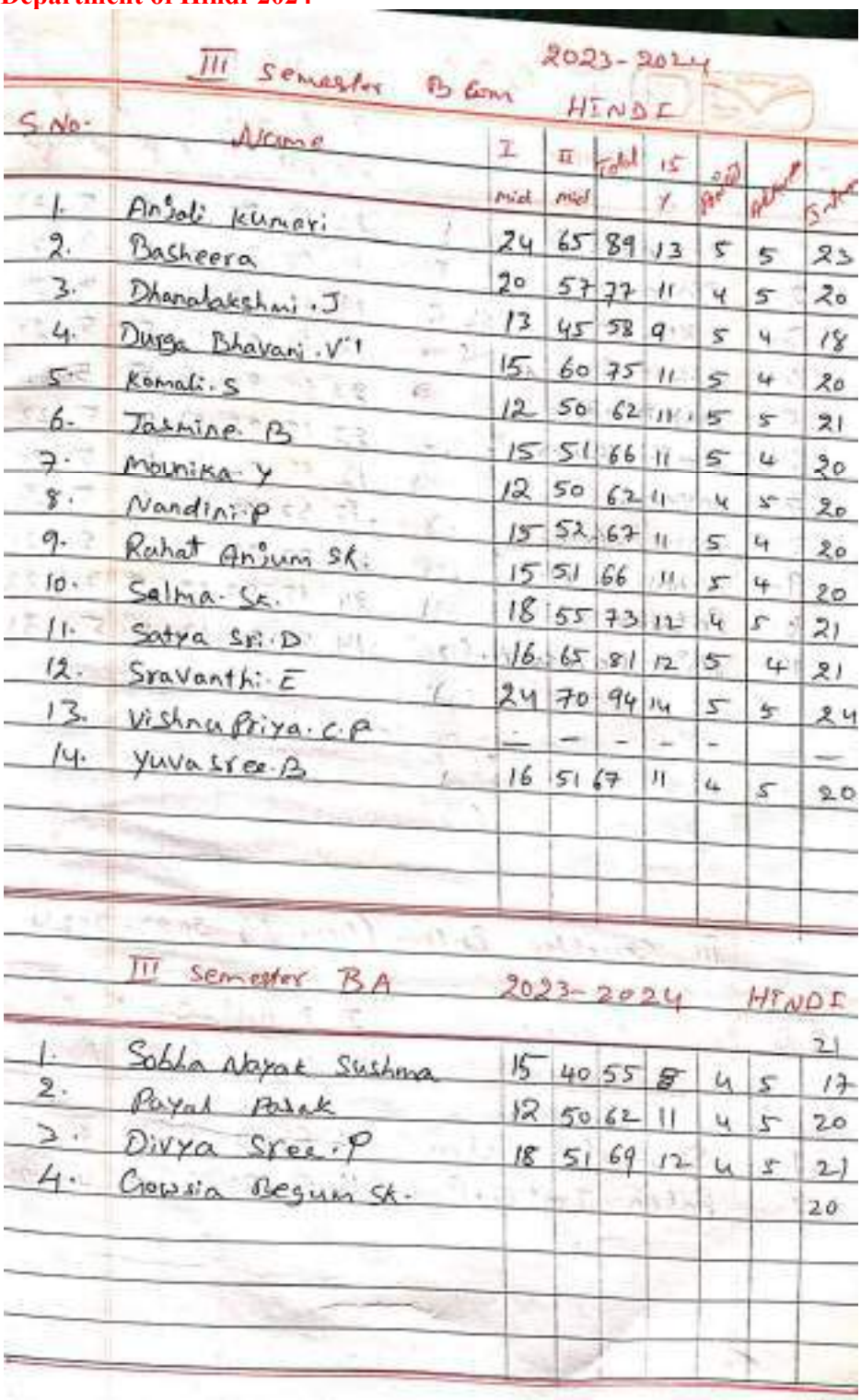
E – [illegible]

2nd MB Sem-3 2023-24

Sl. No	Names	MID I	MID II	Total	15	[illegible]	[illegible]	[illegible]
1	B. Radhika	21	55	76	11	5	4	20
2	B. Gayathri Devi	21	24	45	7	4	4	15
3	B. Jyothi	23	52	75	11	5	5	21
4	B. Vincela	23	60	83	12	5	4	21
5	Ch. Teja	23	67	90	14	5	5	24
6	D. Bhema	21	63	84	13	5	5	23
7	D. Dhana Santhoshi	23	64	87	13	5	5	23
8	J. Rishitha	22	66	88	13	5	5	23
9	S. Meena Tasmine	23	67	90	14	5	5	24
10	Smt P. Manideepika	23	67	90	14	5	5	24
11	T. Chandini	24	66	90	11	5	4	20

Total :- 11
present :- 11
Absent :- Nil
pass percentage :- 100%

Department of Hindi-2024



III Semester B Com HINDI 2023-2024

S.No.	Name	I mid	II mid	Total	15			
1.	Anjali Kumari	24	65	89	13	5	5	23
2.	Basheera	20	57	77	11	4	5	20
3.	Dhanalakshmi. J	13	45	58	9	5	4	18
4.	Durga Bhavani. V	15	60	75	11	5	4	20
5.	Komali. S	12	50	62	11	5	5	21
6.	Jasmine. B	15	51	66	11	5	4	20
7.	Mounika. Y	12	50	62	11	4	5	20
8.	Nandini. P	15	52	67	11	5	4	20
9.	Ruhat Anjum SK.	15	51	66	11	5	4	20
10.	Salma. Sk.	18	55	73	12	4	5	21
11.	Satya Sri. D	16	65	81	12	5	4	21
12.	Sravanthi. E	24	70	94	14	5	5	24
13.	Vishnu Priya. C.P	-	-	-	-	-		-
14.	Yuvasree. B	16	51	67	11	4	5	20

III semester BA 2023-2024 HINDI

								21
1.	Sobha Nayak Sushma	15	40	55	8	4	5	17
2.	Payal Patak	12	50	62	11	4	5	20
3.	Divya Sree. P	18	51	69	12	4	5	21
4.	Gousia Begum SK.							20

III Semester B.B.A. HINDI

S.No	Name	I mid	II mid	Total	15 %	[illegible]	[illegible]	[illegible]
1	Dhanam R	23	12	35	13	5	5	23
2	Deepa M	14	15	29	12	5	4	21
3	Ebin Joy	17	20	37	12	5	4	21
4	Esther Abhi N	22	30	52	11	5	5	21
5	Gayathri T	23	60	83	12	5	5	22
6	Jyothi [illegible]	23	15	38	13	4	5	22
7	Kavya A	15	57	72	11	4	5	20
8	[illegible] M	15	50	65	11	4	5	20
9	Niharika M	24	55	79	12	4	5	21
10	Prithika B	24	15	39	13	5	5	23
11	Raja Rajeswari A	24	30	54	12	5	5	21

III Semester MPCS 2023-2024 HINDI

S.No	Name	I mid	II mid	Total	15 %	[illegible]	[illegible]	[illegible]
1	Babu Reddy O	12	45	57	12	5	5	22
2	Lakshmi G	18	45	63	11	4	5	20
3	[illegible] K	22	70	92	14	5	5	24
4	[illegible] A	12	45	57	12	4	5	21
5	Shabnam	22	24	46	14	5	5	24
6	Bharathi P	18	45	63	11	4	5	20
7	Dhanam L	12	30	42	10	4	5	19
8	Divya L	18	50	68	11	5	5	21
9	Pooja N	10	60	70	10	5	4	19
10	Sravani K	12	50	62	10	5	4	19
11	Gayathri V	15	45	60	10	5	5	20

III Semester B.Com (General) 2023-2024

S.No	Name	I mid	II mid	Total	15 %	[illegible]	[illegible]	[illegible]
1	Sushmita Mishra	16	52	68	11	5	4	20
2	Ratna [illegible] P	15	55	70	11	5	4	20

II Semester MPC HINDI

S.No	Name	I mid	II mid	Total	15 %	[illegible]	[illegible]	[illegible]
1	Jasmine	17	52	69	11	4	4	19
2	Sireesha	23	62	85	13	5	5	23
3	[illegible]	21	60	81	12	4	4	20

– Internal marks of Hindi –

III Semester M.S.C.S 2023-2024

S.No	Name	I mid	II mid	Total	15 %	Attendance	Project	External
1.	Harika. P	22	50	72	10	5	5	20
2.	Hema. Y	22	55	77	11	4	5	20
3.	Raga mallika. U	18	60	78	11	5	5	21
4	Jhansi. K.	12	50	62	11	4	5	20
5	Wajeeda Noori	22	60	82	12	5	5	22
6	Manju. N.	11	50	61	11	4	5	20
7	Devi. A	15	48	63	11	4	5	20
8	Varsha. K	14	51	65	11	5	5	21

III Semester C.B.Z 2023-2024

S.No	Name	I mid	II mid	Total	15 %	Attendance	Project	External
1.	Swapna Swaroopa. R	23	65	88	13	4	5	22
2.	Dharani. U	17	45	62	11	5	5	21

III Semester M.D.

S.no	Name	I mid	II mid	Total	15 %	Attendance	Project	External
	Chandini. K	20	50	70	10	4	5	19

III sem- 64 55

III B.A – Sem – V

Public – Paper VI B E-Governance

		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1	B Anjali	23	72	95	14	5	5	24
2	B. Pramila	24	74	98	15	5	5	25
3	B Sravanthi	25	73	95	15	5	5	25
4	D Manoj	23	73	96	14	5	4	23
5	G. Revathi	24	74	98	15	5	5	25
6	K Kathima Priyanka	24	72	97	15	5	4	24
7	Payal Barik	23	72	95	14	5	4	23
8	P Divya Sri	25	74	99	15	5	5	25
9	S. Girithomi	24	73	97	15	5	5	25
10	Sushma Sabhanayak	24	74	98	15	5	5	25
11	Y. Rebeca	23	73	96	14	5	5	24
12	Buna Sukanya							
13	Moulya Sultana Begum	23	72	95	14	5	4	23
14	S Purna	23	70	93	14	5	5	24

Department of Public Administration-2024

III BA – Sem – V

Public – Paper VI B E-Governance

	Name	Mid-1 (25)	Mid-2 (70)	[illegible]	[illegible] 15	[illegible] 5 (Character)	[illegible] 5 (Attendance)	[illegible] (25)
1	B. Anjali	23	72	95	14	5	5	24
2	B. Pramila	24	74	98	15	5	5	25
3	B. Sravanthi	25	73	98	15	5	5	25
4	D. Mercy	23	73	96	14	5	4	23
5	G. Revathi	24	74	98	15	5	5	25
6	K. Kathma Priyanka	24	73	97	15	5	4	24
7	Payel Basak	23	72	95	14	5	4	23
8	P. Divya Sri	25	74	99	15	5	5	25
9	S. Gouthami	24	73	97	15	5	5	25
10	Susuma Sabhanayak	24	74	98	15	5	5	25
11	Y. Bebera	23	73	96	14	5	5	24
12	Buna Sukanya							
13	Goushya Sultana Begum	23	72	95	14	5	4	23
14	S. Pushpa	23	70	93	14	5	5	24

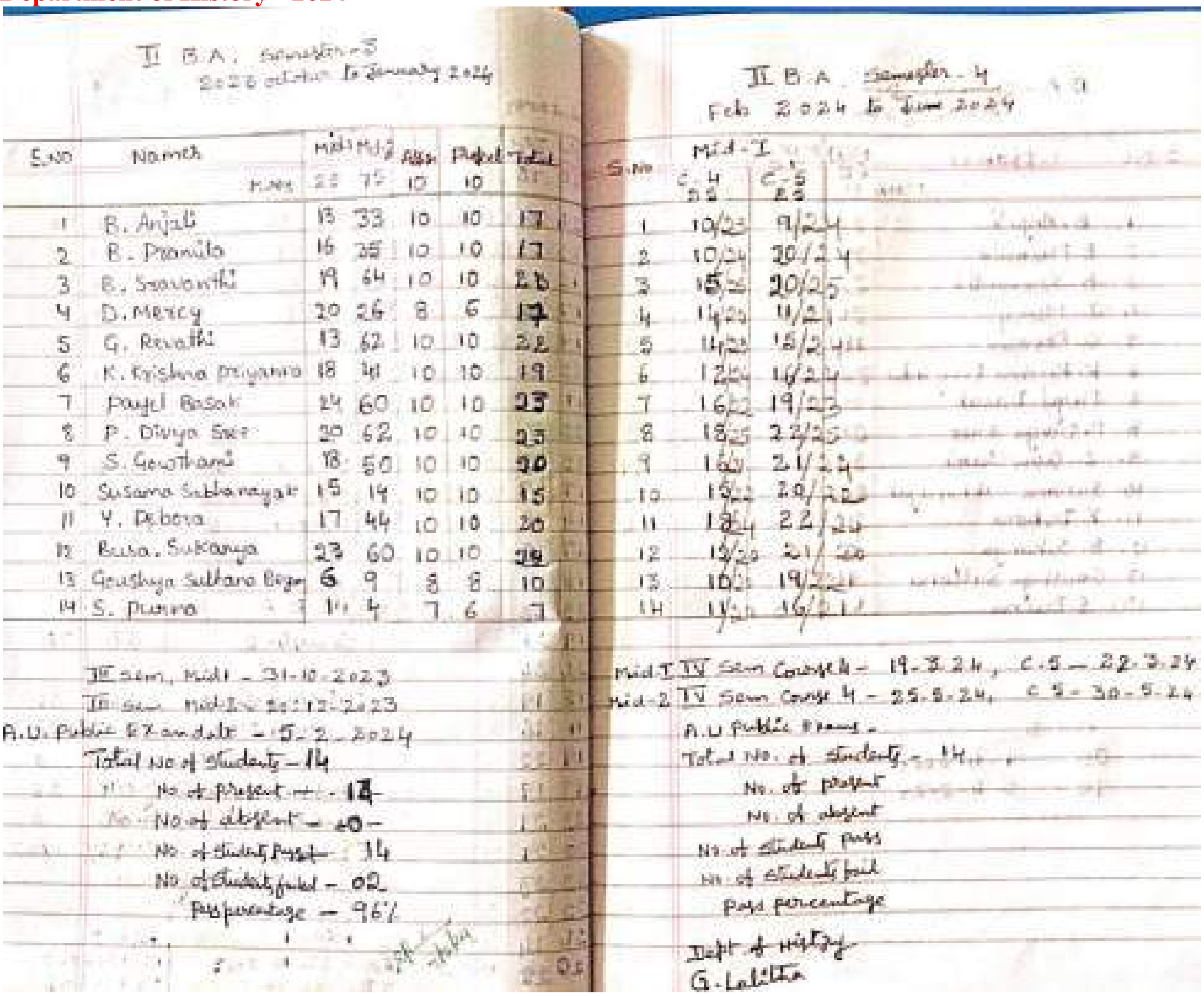
III B.A – Sem VI

Politics – paper VII B

Local Administration

	(25) Mid I	(75) Mid II	?? / ??	T? 15	Seminar (5)	Attendance (5)	IA (25)
① B. Anjali	23	72	95	14	5	4	23
② B. Bhavani	25	74	99	15	5	5	25
③ B. Sravanthi	25	74	99	15	5	5	25
④ D. Mercy	22	70	92	14	5	4	23
⑤ G. Revathi	25	73	[illegible]	15	5	5	25
⑥ K. Krishna priyanka	25	73	98	15	5	4	24
⑦ Payal Bhat	22	70	92	14	5	4	23
⑧ P. Divya Sri	25	73	98	15	5	5	25
⑨ S. Gautami	25	73	95	15	5	5	25
⑩ Suwarna Sabbavarapu	25	72	97	15	5	5	25
⑪ Y. Bhavana	24	72	96	14	5	5	24
⑫ Busi Sukanya							
⑬ Gouskya Sultana Begum	22	70	92	14	5	4	23
⑭ S. Pushpa	22	68	90	14	5	5	24

Department of History - 2024



II B.A. Semester-3
2023 October to January 2024

S.No	Names	Mid I	Mid 2	Assn	Project	Total
	Marks	25	75	10	10	
1	B. Anjali	13	33	10	10	17
2	B. Pramila	16	35	10	10	17
3	B. Sravanthi	19	64	10	10	26
4	D. Mercy	20	26	8	6	17
5	G. Revathi	13	62	10	10	22
6	K. Krishna Priyanka	18	41	10	10	19
7	Payel Basak	24	60	10	10	23
8	P. Divya Sree	20	62	10	10	23
9	S. Gowthami	18	50	10	10	20
10	Susama Subbarayar	15	14	10	10	15
11	Y. Debora	17	44	10	10	20
12	Busa. Sukanya	23	60	10	10	28
13	Goushya Sultana Begum	6	9	8	8	10
14	S. Purna	11	4	7	6	7

III sem, Mid I – 31-10-2023
III sem Mid-II – 20-12-2023
A.U. Public Exam date – 5-2-2024
Total No of Students – 14
No of present – 14
No of absent – 00 –
No of students Passed – 14
No of students failed – 02
Pass percentage – 96%

II B.A. Semester - 4
Feb 2024 to June 2024

S.No	Mid-I C-4 25	C-5 25
1	10/25	9/24
2	10/24	20/24
3	15/25	20/25
4	14/25	11/21
5	14/25	15/24
6	12/24	16/24
7	16/22	19/23
8	18/25	22/25
9	16/21	21/24
10	15/22	20/22
11	18/24	22/24
12	19/20	21/20
13	10/21	19/22
14	11/21	16/21

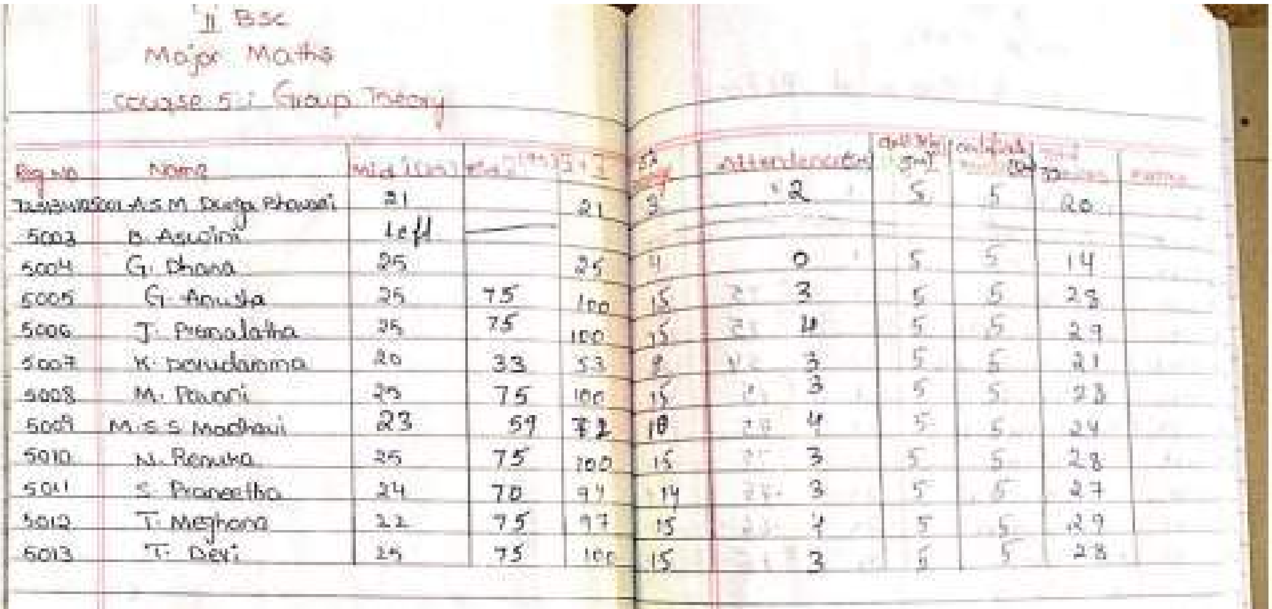
Mid-I IV Sem Course 4 – 19-3-24, C-5 – 22-3-24
Mid-2 IV Sem Course 4 – 25-5-24, C-5 – 30-5-24
A.U Public Exams –
Total No. of students – 14
No. of present
No. of absent
No of students pass
No. of students fail
Pass percentage
Dept of History
G. Lalitha

B.A - Semester - 5
2024 July to Dec

S.No	Names	Mid-I GB	Mid-I TB	Mid-II GB	Mid-II TB	Assignment GB	Assignment TB	GB	TB
	Marks	25	25	75	75				
1.	B. Anjali	21	11	41	40	10	10	20	19
2	B Pramila	24	18	52	51	10	10	22	20
3	B Sravanthi	22	24	63	63	10	10	23	23
4	P. Manu	20	15	3	2	10	10	13	12
5.	G. Revathi	18	23	59	59	10	10	22	22
6	K. Krishna Priyanka	22	20	42	62	10	10	20	22
7	Payel Basak			55	60	10	10	19	18
8	P. Divya Sree	24	23	49	65	10	10	22	23
9.	S. Gowthami	23	16	69	49	10	10	24	20
10	Susuma Subhanayak	21	14	43	37	10	10	19	19
11.	Y. Dabeta	21	23	49	54	10	10	22	22
12.	B. Sukanya	a	a	a	a	-	-	-	-
13	Goushya Sultana	16	14	a	a	10	10	12	12
14.	S. Purna	21	08	a	a	10	10	10	10

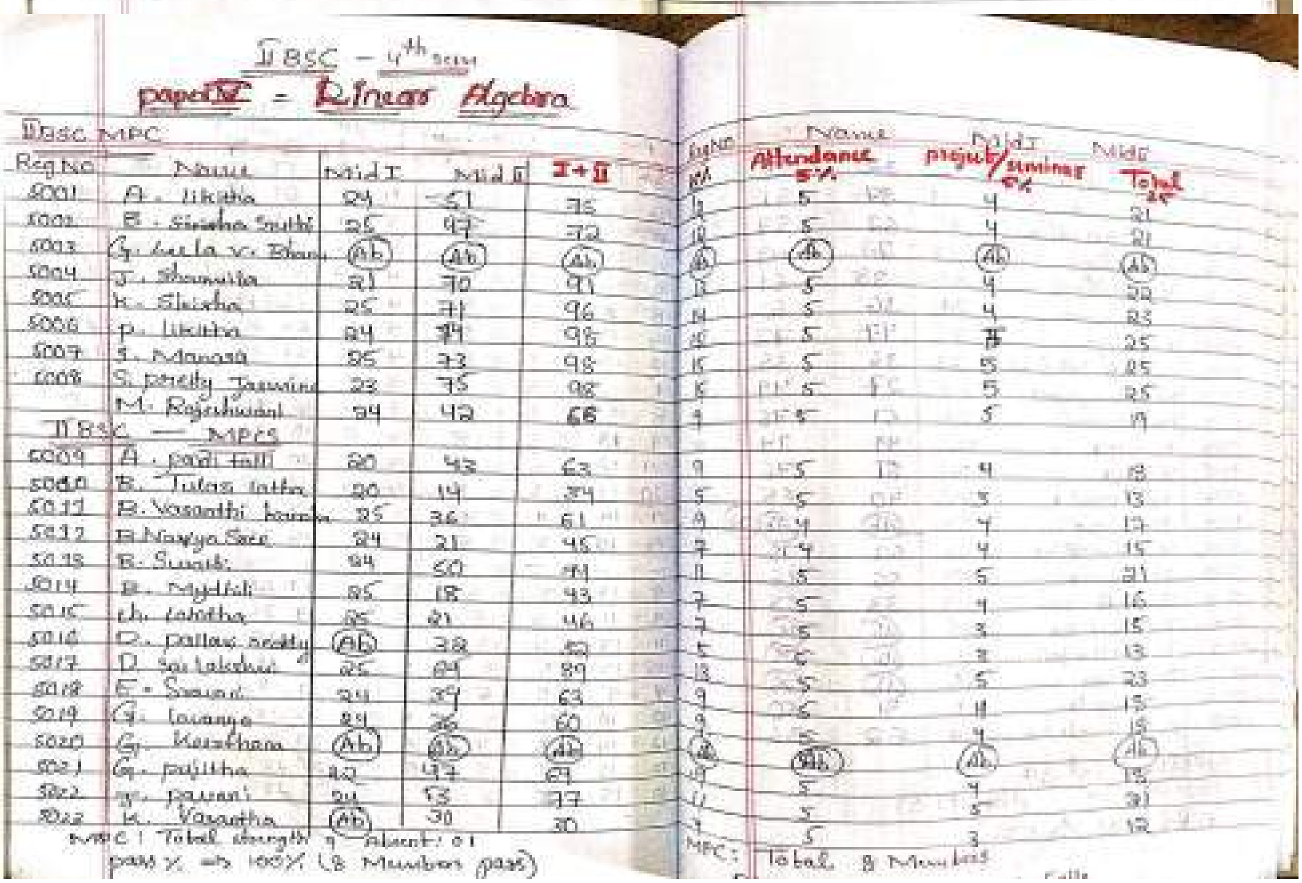
Mid-II
GB - 1-11-2024
TB - 5-11-2024

Department of Mathematics- 2024



II BSC
Major Maths
course 5: Group Theory

Reg No	Name	Mid I (25)	Mid II	I+II	15	Attendance	Assignment		Total 30	Marks
22123WR5001	A.S.M Durga Bhavani	21		21	3	2	5	5	20	
5003	B. Aswini	left								
5004	G. Dhana	25		25	4	0	5	5	14	
5005	G. Anusha	25	75	100	15	3	5	5	28	
5006	J. Premalatha	25	75	100	15	2	5	5	27	
5007	K. Pandamma	20	33	53	8	3	5	5	21	
5008	M. Pavani	25	75	100	15	3	5	5	28	
5009	M.S.S Madhavi	23	59	82	18	4	5	5	24	
5010	N. Renuka	25	75	100	15	3	5	5	28	
5011	S. Praneetha	24	70	94	14	3	5	5	27	
5012	T. Meghana	22	75	97	15	4	5	5	29	
5013	T. Devi	25	75	100	15	3	5	5	28	



II BSC – 4th sem
paper IV = Linear Algebra

II BSC MPC

Reg No	Name	Mid I	Mid II	I+II		Attendance 5%	project/seminar 5%	Total 25
5001	A. Likitha	24	51	75	11	5	4	21
5002	B. Sireesha Sruthi	25	47	72	11	5	4	21
5003	G. Leela V. Bhav.	Ab	Ab	Ab	Ab	Ab	Ab	Ab
5004	J. Shamitha	21	70	91	13	5	4	22
5005	K. Sirisha	25	71	96	14	5	4	23
5006	P. Likitha	24	74	98	15	5	5	25
5007	S. Manasa	25	73	98	15	5	5	25
5008	S. Preethy Jasmine	23	75	98	15	5	5	25
	M. Rajeshwari	24	42	68	9	5	5	19
II BSC — MPCS								
5009	A. Pavani	20	43	63	9	5	4	18
5010	B. Tulasi latha	20	14	34	5	5	3	13
5011	B. Vasanthi kumari	25	36	61	9	4	4	17
5012	B. Navya Sree	24	21	45	7	4	4	15
5013	B. Swathi	24	50	74	11	5	5	21
5014	B. Mythili	25	18	43	7	5	4	16
5015	Ch. Lalitha	25	21	46	7	5	3	15
5016	D. Pallavi Reddy	Ab	38	38	5	5	3	13
5017	D. Sai Lakshmi	25	64	89	13	5	5	23
5018	E. Sravani	24	39	63	9	5	[illegible]	15
5019	G. Lavanya	24	36	60	9	5	4	15
5020	G. Keerthana	Ab	Ab	Ab	Ab	Ab	Ab	Ab
5021	G. Pujitha	22	47	69	10	5	4	15
5022	Y. Pavani	24	53	77	11	5	5	21
5023	K. Vasantha	Ab	30	30	4	5	3	12

MPC: Total strength 9 Absent: 01
pass % => 100% (8 Members pass)

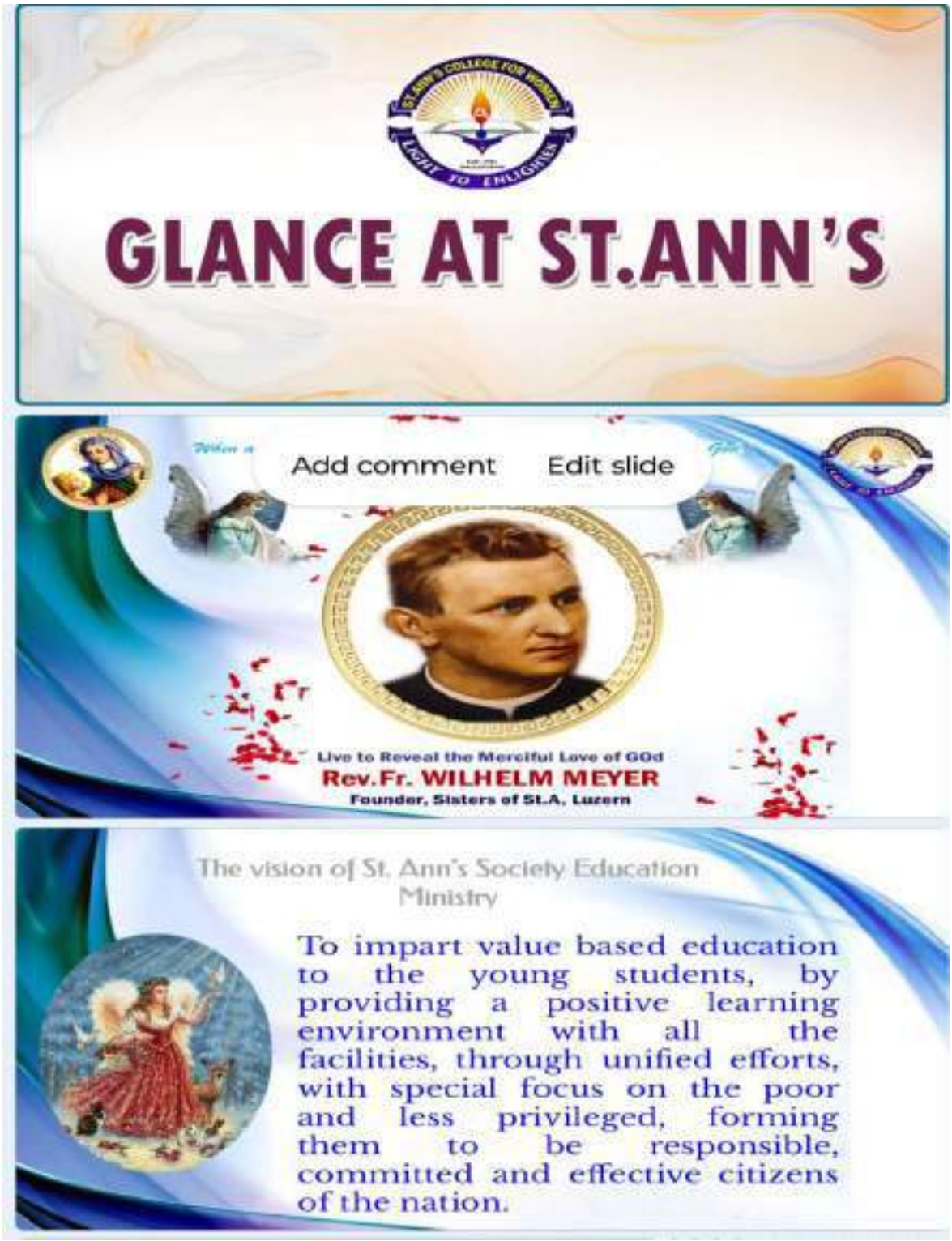
MPC: Total 8 Members

II Bsc
Major Maths

Course 6 : Numarical Methods

Reg NO	Name	Mid I	Mid II	I + II	15% average	attendance (5M)	[illegible] (5M)	[illegible] (5M)	Total 30 marks	[illegible]
7231240500	A.S.M. Durga Bhavani	21		21	3	2	5	5		
5003	B. Aswini	Left								
5004	G. Dhana	21		21	3	0	5	5		
5005	G. Anusha	25	75	100	15	3	5	5		
5006	J. Premalatha	25	75	100	15	4	5	5		
5007	K. Devudamma	22	54	76	11	3	5	5		
5008	M. Pavani	17	75	92	14	3	5	5		
5009	M.S.S. Madhavi	24	75	99	15	4	5	5		
5010	N. Renuka	25	75	100	15	3	5	5		
5011	S. praneetha	24	75	99	15	3	5	5		
5012	T. Meghana	25	66	91	14	4	5	5		
5013	T. Devi	25	75	100	15	3	5	5		

Document :8 COLLEGE ACADEMIC ACTIVITES 2024



Genesis

- Low female literacy
- Lack education related to the market need
- lack of education and livelihood opportunities for poor female children particularly in Rural, Tribal and industrial areas
- need for providing better higher educational services to young girls
- Need for foaming empowered women

VISION

We envisage the empowerment of young girls of today through value based wholistic education to champion the cause of justice, peace, love, truth, and live in harmony with the nature and are ever open to future growth.

MISSION

St. Ann's College for Women through value based education empower the young girls who can be intellectually competent, spiritually mature, morally upright, psychologically integrated, physically healthy socially acceptable who live in harmony with nature and God.

Thrust : Making our Educational Institutions, centers of Good News.

Core Values

1. ***God consciousness***
2. ***Altruism /Compassion***
3. ***Universal brotherhood***
4. ***Religious tolerance***
5. ***Emotional Maturity***
6. ***Intellectual Excellence***
7. ***Creative /Critical Thinking***
8. ***Moral and social responsibility***
9. ***Eco – friendliness***

SPECIAL ACHIEVEMENTS AND IMPORTANT MILESTONES

1991- 2024

1991	Center for Extension Service NCC Unit
1993	NSS Unit
1997	Initiation of Add on Courses
2006	Red Ribbon Club
2010	Best Red Ribbon Club District Award

2010 & 2011	NSS State Level Best Volunteers Awards
2010 & 2011	NSS State Level Best Po's Awards
2013	AISHE
2014	Placement Cell/ Carrier Guidance
2015	UNICEF


2015
NSS Best Po's National Awards
2015
NSS Best Unit National Award
2017
NIRF
2017
Centre for APSSDC
Skill Enhancement
201
UBA
2020
ISO
2020
UGC 12(b) & 2 (f)
2020
RC & Community Engagement
2020
Extension of 2nd Floor of College
2021
Swatchatha Ranking (A Grade)
2021
Permanent affiliation to
Andhra University
2021
Addition new courses BA English, BBA,MPCs
2021
Award of honor by the Anudeep
foundation
2021
Construction of magnificent Auditorium
2021
Best participation Award in swachh Bharat Pakhwada
2022
Addition new courses BCA & BA
(Travel & Tourism)

COURSES OFFERED

DEGREE MAJOR COURSES

- B.Sc Honours (Computer Science)
- B.SC Honours (Microbiology)
- B.SC Honours (Botany)
- B.SC Honours (Zoology)
- B.SC Honours (Mathematics)
- B.SC Honours (Physics)
- B.SC Honours (Chemistry)
- BA Honours (Special English)
- BA Honours (Tourism & Travel Management)
- BA Honours (Social Work)
- B Com Honours (Computer Applications)
- BCA Honours
- BBA Honours

CERTIFICATE COURSES : 100

- TALLY FOR DEGREE FINAL YEARS FROM ANUDEEP FOUNDATION
- WEB DESIGNING FOR DEGREE FINAL YEARS FROM ANUDEEP FOUNDATION
- DIGITAL MARKETIN FOR FINAL DEGREE FROM ANUDEEP FOUNDATION
- TOURISM AND GUIDANCE
- MEDICINAL PLANTS
- MUSHROOM CULTIVATION
- VERMICOMPOST
- LAB MANAGEMENT TECHNIQUES
- NURSERY

ADD ON COURSES LIST : 12

COMPUTERS COURSES(PHOTO SHOP/ TYPING SKILLS/MULTIMEDIA)

- DANCE
- BEAUTICIAN
- FASHION TECHNOLOGY
- MUSIC
- COMMUNICATION SKILLS FROM ANUDEEP FOUNDATION FOR DEGREE FINAL YEARS
- INTERVIEW SKILLS FROM ANUDEEP FOUNDATION FOR DEGREE FINAL YEARS
- BASIC COMPUTER APPLICATIONS FROM ANUDEEP FOUNDATION FOR DEGREE FINAL YEARS

COURSES OFFERED

DEGREE MAJOR COURSES

- B.Sc Honours (Computer Science)
- B.SC Honours (Microbiology)
- B.SC Honours (Botany)
- B.SC Honours (Zoology)
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- BBA Honours

CERTIFICATE COURSES : 100

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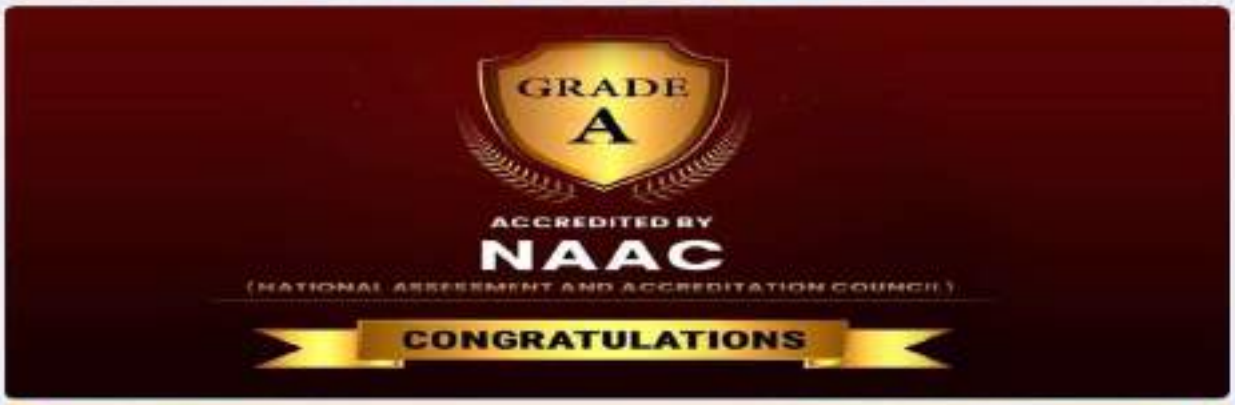
- INTERVIEW SKILLS FROM ANUDEEP FOUNDATION FOR DEGREE FINAL YEARS
- BASIC COMPUTER APPLICATIONS FROM ANUDEEP FOUNDATION FOR DEGREE FINAL YEARS



"St. Ann's College for Women is proud to announce its prestigious NAAC 'A' Grade accreditation, a testament to its commitment to academic excellence and student-centric education. This esteemed recognition validates our institution's dedication to quality education, enhances our credibility and reputation, and boosts our

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State Recognition for NAAC

St.Ann's Degree College For Women

SWACHH RANKING
'A'

Awarded with
ISO

λutonomous

"We are pleased to announce that St. Ann's College for Women has achieved autonomous status, granting us greater academic freedom and flexibility. This milestone reflects our commitment to excellence in education and our dedication to empowering

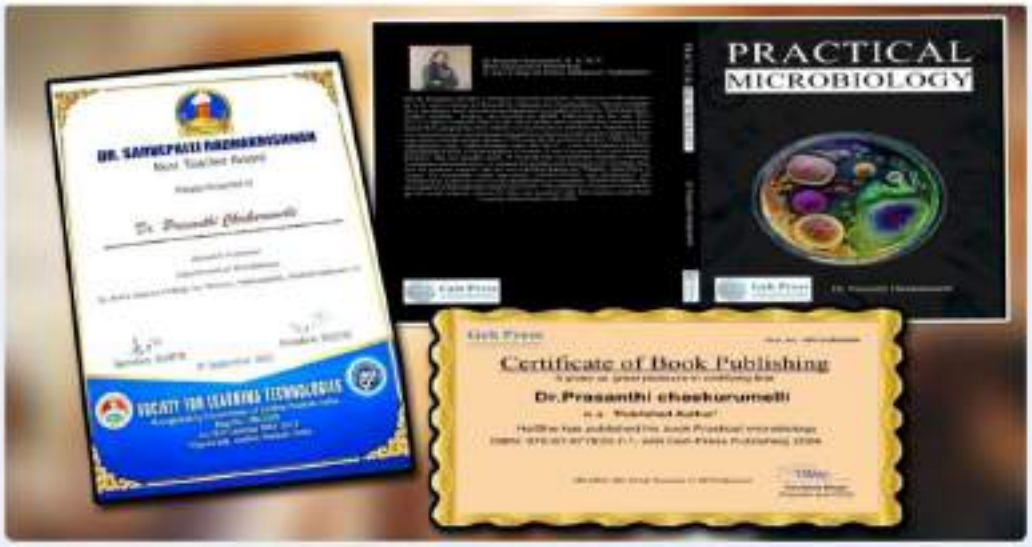
The achievement of ISO [specify standard, e.g., 9001:2015] certification, demonstrating our commitment to excellence in education and quality management, ensuring enhanced academic quality, efficient administrative processes, improved student satisfaction, and continuous improvement, reinforcing our dedication to providing a world-class

Year	2020-21	2021-2022	2023-2024	2024-2025
Number	31	11	17	07...


St.Ann's Degree College For Women
Certificate of Appreciation
Sr. Dr. Prema Kumari Jannedu
BEST
PLANT EAXONOMIST
AWARD


UNIVERSITY AND DISTRICT AWARDS BY NSS
1. University and District awards by NSS
FLASH NEWS
ఫ్లాష్ న్యూస్
Website: www.flashnewsprajatantram.com
సెయింట్ ఆన్స్ కళాశాల ఎన్ఎస్ఎస్ వలంటీర్లకు అవార్డులు

Mrs. Jayasri Peli (Dr) is currently Guest Editor for the 44th issue of a Scopus Journal "Journal of Economics and Management,". In past one year she has published 9 high-quality articles in Web of Science database with an H-Index of 2 and received 10 citations for these 9 papers. Mahati is recruited by Manyasri Fin Serve Pvt. Ltd. as a Human Resource Analyst for campus interview at Andhra University on 16/01/2024. She recently worked as Chief Editor for Career Journey of WOMEN EMPOWERMENT book which was released in March


PRACTICAL
MICROBIOLOGY
Certificate of Book Publishing
Dr.Prasanthi chekurumelli


BEST TEACHER
Mrs. ROJA
BEST TEACHER
Mrs.B.SANTHI


Student
ACHIEVEMENT


UNIVERSITY 1ST RANK
SURISETTY VASANTHA LAKSHMI
Congratulations
CGPA
9.86
Rank
Our
Outstanding
Students
DISTRICT LEVEL
3rd
RANK
KOTA ALEKHYA
Congratulations!
AP ICET - 2024
STATE 3rd RANK
SURISETTY VASANTHA LAKSHMI

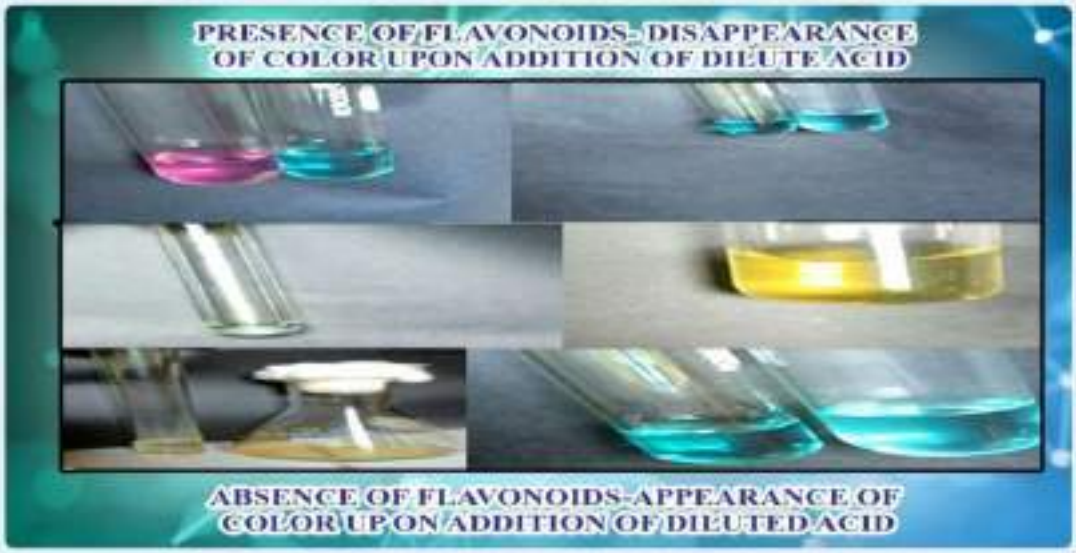

PGCET : A.Nandini
Rank : 23
Shaik Rukhiya Begum
Rank : 153
Shahenaz Sulthana
Rank : 64
Samena Khuesar
Rank : 277
L.Swathi Thanishka
Rank : 265
Mounika
Rank : 400


STUDENTS
RESEARCH
PROJECT

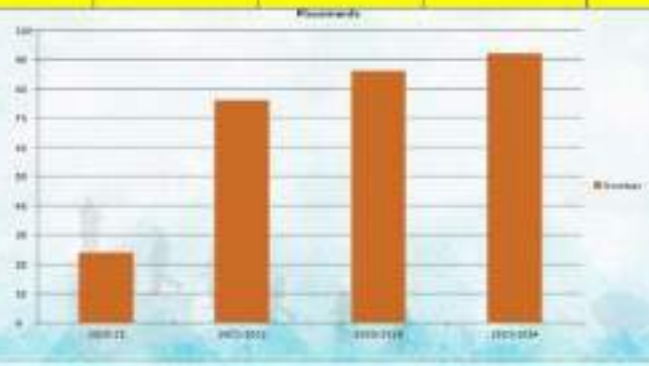
S.no	Name of the Project	Carried out by
1.	ORGANIC HUB (HERBAL HAIR MASK)	Department of microbiology Presenting SHINY HAIR MASK
2.	Comparative study of synthetic and herbal sanitizer and its biological and phytochemical activity	Shaik. Valisha Students involved:Vasantha Lakshmi, Ch. Jyoshna, R. Nandini, Ch. Dharani of 3rd b. sc(m.p.c)
3.	A preliminary screening on biodegradability of face mask and their impact on plant growth of Hibiscus sabdariffa, Andhra Pradesh, India	Department of microbiology
4.	"A Review on phytochemical secondary metabolites of five wild mushroom extracts and their	Madam Sudha and Students

POTATO DEXTROSE BROTH WITH MASK PIECES

NUTRIENT BROTH WITH MASK PIECES



Year	2020-21	2021-2022	2022-2023	2023-2024
Number	24	76	86	92



80% Placement success : Where Talent meets Opportunity

Campus to Corporate

INTERNSHIP

Students are encouraged to pursue internships with leading companies and institutions. Internships provide real-world experience and help students apply theoretical knowledge in practical settings. They are key to developing professional skills and improving employability. Many students secure job offers through their internship performance.

FIELD VISITS

Field Trips: Regularly organized field trips give students hands-on experience and industry exposure. They visit historical, industrial, and environmental sites relevant to their curriculum. These trips bridge the gap between theory and practice, enhancing learning. Field trips foster collaboration, critical thinking, and practical application of knowledge.

Sport Games

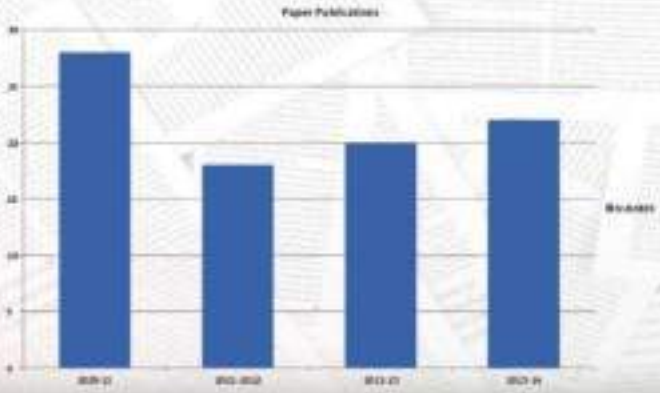
To promote physical fitness and teamwork through annual sports meets, days, and weeks. Our campus comes alive with enthusiasm as students participate in various events like track and field, basketball, football, volleyball, and cricket. These initiatives foster camaraderie, discipline, and healthy competition, helping students develop essential life skills beyond academics."

SPECIAL FEATURES OF ST.ANN'S COLLEGE

E- GOVERNANCE

St. Ann's College for Women has implemented Linways, an online Learning Management System (LMS) designed to streamline academic processes. It provides a range of features for both students and staff to enhance the overall learning experience. Key features include: access to course materials, assignment submission, exams and quizzes, progress tracking, attendance monitoring, timetable and calendar management, communication with teachers, and real-time notifications and

YEAR	2020-21	2021-2022	2022-23	2023-2024
NUMBER	09	06	24	10



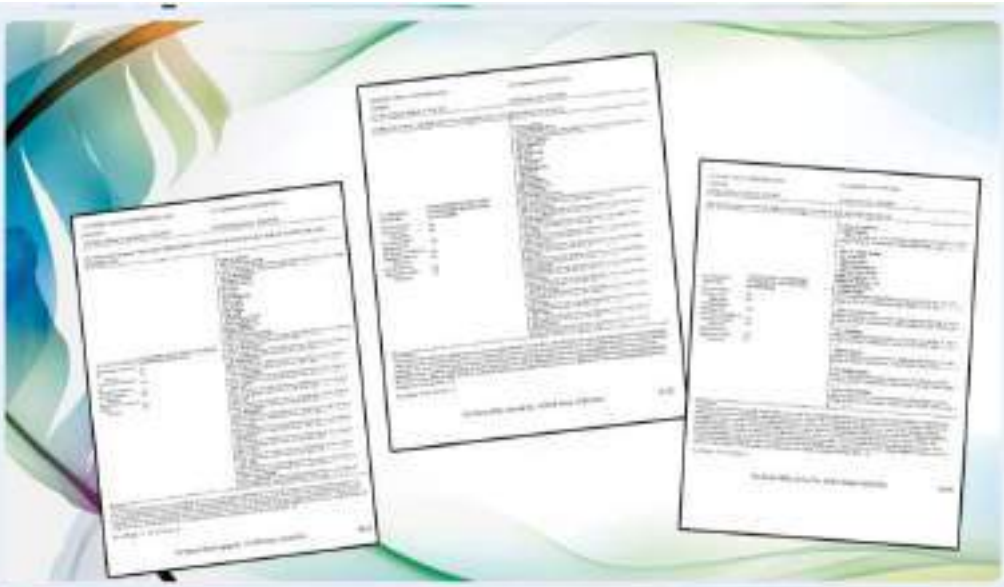
PATENT RIGHTS

- Method and System for Micro-Scale Dehydration of Vegetables: This invention offers a solution for preserving vegetables through dehydration, enhancing their shelf life and nutritional value.-

Wealthy Wheat Drop: A System for Sustainable Wheat Harvesting and Distribution: This system aims to optimize wheat harvesting and distribution, promoting sustainability and efficiency in the agricultural sector.

Natural Herbal Sanitizer: A Chemical-Free Solution for Hygiene: This invention provides a chemical-free alternative for hygiene, utilizing natural herbs to create a sanitizer.

These patents demonstrate the college's commitment to research, innovation, and solving real-world problems. St. Ann's College for Women has a strong focus on academic excellence, skill development, and value enrichment, with a well-developed R&D department.



INSTITUTIONAL MOUS

YEAR	2020-21	2021-2022	2022-23	2023-2024
NUMBER	16	14	19	20

MOUs With Different Organization

MOU (Memorandums of Understanding): The institution has signed several MOUs with industry leaders and international universities. These agreements foster collaboration in research, internships, and knowledge exchange. MOUs help bridge academia-industry gaps and offer students broader learning opportunities. They are crucial for fostering global partnerships and enhancing educational quality.

WE RECEIVED AROUND 25 MOUS

UNDER AMAL COLLEGE, ANKAPALLE MOU, FACULTY EXCHANGE PROGRAMME TOOK PLACE IN BOTH COLLEGES

EXCHANGE OF MOU BETWEEN HOLY CROSS COLLEGE, TAMIL NADU AND ST. ANN'S COLLEGE FOR WOMEN

UNDER PEST CURE SOLUTIONS MOU, 2 MONTHS INTERNSHIP WAS CONDUCTED TO STUDENTS OF ST. ANN'S COLLEGE FOR WOMEN, AND GAVE CERTIFICATES FOR THEIR BEST PERFORMANCE.

UNDER MOU OF EAST COAST CONSERVATION TEAM, MADURAVADA ST.IDENTS OF ST. ANN'S COLLEGE GONE TO FIELD VISIT

UNDER MOU OF ST. ALOYSIUS INDUSTRIAL TRAINING INSTITUTE, STUDENTS OF ST. ANN'S COLLEGE PARTICIPATED IN INTERNSHIPS

SEMINARS & WORKSHOPS CONDUCTED

YEAR	2020-21	2021-2022	2022-23	2023-24	2024-25
NUMBER	28	18	20	22	15...

Seminars / Workshops / FDP's

Total Programmes Organized : 156
Total Programmes Attended : 54
(Out of the College)

we prioritize faculty and student development through diverse initiatives. Our college regularly organizes seminars, workshops, and Faculty Development Programs (FDPs) to foster academic excellence and skill enhancement. Renowned experts share insights on cutting-edge topics, empowering our faculty and students with latest knowledge and best practices. Recent FDPs focused on pedagogy, research methodologies, and industry trends. Students benefit from workshops on communication skills, entrepreneurship, and career development. We also invite external experts to conduct sessions on emerging areas like AI, data analytics, and sustainability. Our faculty and students are encouraged to attend conferences, webinars, and training programs outside the college, broadening their perspectives and networking opportunities. By investing in human capital, we strive to create a


WOMEN


Visakhapatnam, Andhra Pradesh, India
St Anns Jm Hospital Hostel, Malkapuram, Malkapuram, Visakhapatnam, Andhra Pradesh 530011, India
Lat 17.684692°
Long 83.23943°
10/12/21 02:35 PM
Google


Visakhapatnam, Andhra Pradesh, India
48, Industrial Colony, Malkapuram,
Visakhapatnam, Andhra Pradesh 530011, India
Lat 17.6843131°
Long 83.239808°
28/11/22 11:30 AM GMT +05:30
Google

New Facilities Added

LIBRARY RENOVATION

We recently undergone a magnificent renovation, transforming its infrastructure to provide a cutting-edge learning environment. The revamped facility boasts:

•Modern cupboards for efficient storage •State-of-the-art digital library for enhanced research •Ergonomic tables and chairs for comfortable studying

Extention of Auditorium

Practices special to the

- SAS week
- Empowering of young girls
- No bag day/zero hour
- Add on courses
- 1st Friday of the month clean and green
- 15 th of every month vehicle free day
- Internships and field visits
- Presenting the saplings on special occasion
- Plastic free zone
- Value education period once a week
- Sports and games week
- Community based activities
- Personality development
- Starting the day with prayer and inspirational reading
- prayer on important occasions.
- Lab to land
- STAND Programme
- Earn while you learn

ASSEMBLY

- **Motivational talk by student**
- **Principal's Note**
- **Staff Speech (Every Monday)**
- **News Reading**

PRO POOR PROGRAMME

St. Ann's College for Women's Pro-Poor Program extends beyond its campus walls, embracing a philanthropic vision to empower marginalized students pursuing education elsewhere. Through our Outreach Initiative.

Education of socio economically challenged girl children from the remote villages of India

The aim of the project is to identify young girls and women belonging to lower socio-economic backgrounds and providing them holistic education and thus to bring out disciplined young women of sound moral character who will be an asset and credit to their family and to the country. We intend to foster an atmosphere of intellectual pursuit in which young women, irrespective of any differences, state, society, mix together and attain excellence in their chosen field to study and in moral integrity. We aim to equip the students with new knowledge, new skills, new understanding and new learning habits with positive attitude so that they can achieve their dreams and have a quality life.

BENEFICIARIES

FEE CONCESSION

INTERMEDIATE : STUDENTS : 114 AMOUNT : 7,02,000
DEGREE : STUDENTS : 55 AMOUNT : 6,44,500

HOSTEL PROJECT

TOTAL STUDENTS : 22 AMOUNT : 7,37,000

PRO-POOR PROGRAMME

TOTAL STUDENTS : 04 AMOUNT : 66,500

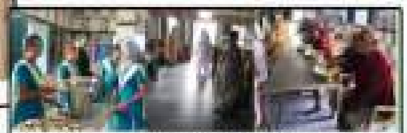
SAS WEEK

S-Sensitivity
A-Alertness
S-Service

Three essential qualities which makes up a good human, we celebrate SAS week and try to inculcate and portray these qualities. A week long students take part in different cultural and service activities.
Visit to orphanages Old age Homes, Hospitals and spending time with them, Donating essentials and spreading smiles. A wholesome experience which adds moral and social values in living.

Beach Blossoms Bridge school by DON BOSCO Nava Jeevan Bala Bhavan society,Visakhapatnam (24th July, 2023)

Mother Theresa Charity House, Gnyanapuram (23rd July 2023)



Loyola Orphanage home for Mentally & Physically challenged, Pendurthi (22nd July,2023)

SAS Week (Student Activity and Sports Week): SAS Week celebrates the talents of students in both academic and extracurricular fields. Various sports, cultural, and literary events are organized, fostering teamwork and competitiveness. The week provides a platform for students to showcase their skills and creativity. SAS Week is a highly anticipated event that enhances the campus's vibrant spirit.

NO BAG DAY


No Vehicle Day
RESTRICTED -
ENTRY
AUTO MOBILES


ST.ANN'S COLLEGE FOR WOMEN
IN ASSOCIATION WITH IQAC CELEBRATES
Peacock Day Dance
Extravaganza


HAPPY
Grandparents
DAY

Sustainability at the Heart of Education

St. Ann's College for Women is committed to creating a sustainable campus that fosters environmental stewardship and social responsibility

SAFETY & SECURITY

We prioritizes the safety and security of our students, staff, and faculty. Our campus is equipped with:

Sustainability at the Heart of Education

St. Ann's College for Women is committed to creating a sustainable campus that fosters environmental stewardship and social responsibility

SAFETY & SECURITY

We prioritizes the safety and security of our students, staff, and faculty. Our campus is equipped with:

National Cadet Corps (NCC): The NCC unit provides opportunities for students to develop discipline, leadership, and service through military training and participation in national camps.

Activities : 12

National Service Scheme (NSS): Through NSS, students are involved in community service activities, including camps, awareness drives, and social service initiatives.

Activities : 40

Days Observed

May & June 2023

1. World environment Day-5th(All Unit)
2. No Vehicle Day-19th
3. International yoga Day-21st(All Unit)
4. No Bag Day-24th

July 2023

1. 111th Birth Anniversary of Wari Bedi w Ramanuja Iti(Dept. of History)
2. World Chocolate Day-7th(Dept. of Biological Sciences)
3. World Population Day-11th
4. World Bag Reuse Day-12th(Dept of Biological Sciences)
5. Plastic Free Day-13th
6. No Vehicle day-15th

August 2023

1. National Handloom Day-(Dept of Telugu)
2. Independence Day-15th
3. CHAR
4. No Vehicle Day-15th
5. Telugu Week(14th to 19th)

September 2023

1. Teacher's Day-5th
2. International Literacy Day-8th(Dept of English)
3. Hindi Diwas-14th(Dept of Hindi)
4. No Vehicle Day-15th
5. World Ozone Day-16th(NSS in collaboration with dept of Chemistry)
6. NSS Day-23rd
7. No Bag Day-26th

October 2023

1. International Non Violence Day-2nd (Dept of History)
2. International Girl Child Day-11th(Dept of Hindi)
3. Vehicle Free Day-13th
4. UNO Day-24th(Dept of History)
5. Unity Day-26th(Dept of History)

November 2023

1. International Day for PREMPS-3rd (Dept of Biological Sciences)
2. World Science Day-10th(Dept of Biological sciences)
3. Library Week(14th to 20th)
4. No Vehicle Day-15th
5. World Heritage Day-20th(Dept of History)
6. Constitution Day-26th(Dept of MEd and Political Science)
7. Immunity Day-28th(Dept of Biological Sciences)
8. Financial Day-29th
9. Complete Aksharas Sankranthi-30th(Dept of Telugu)
10. Extension Lecture on Environment-30th(Dept of English)

December 2023

1. Pollution Control Day-2nd(Dept of Biological sciences)
2. World Soil Day-5th(Dept of Biological sciences)
3. No Vehicle Day-15th
4. Vijay Diwas-16th(Dept of Hindi)
5. Parliament Day-12th
6. No Bag Day
7. International Bio Diversity Day(Dept of Biological Sciences)
8. English Week(Dec 1st to Dec 9th)

January 2024

1. National Bird Day-5th(Dept of Biological Sciences)
2. Vivaa Hindi Diwas-10th(Dept of Hindi)
3. National Youth Day-12th (Dept of Biological Sciences)
4. National Girl Child Day-24th(Dept of Biological Sciences, Statistics, Mathematics & Post Graduation of Anti Sexual Harassment Committee &HOD English)
5. Republic Day-26th
6. Vigil for Female teachers-28th(Dept of Telugu)
7. Pantur x Day-30th(Dept of Commerce and Management)

February 2024

1. Pulses Day-10th(Dept of Biological Sciences)
2. International Day of Women and Girls in Science-11th (Dept of Biological Sciences)
3. Darwin's Day-12th (Dept of Biological Sciences)
4. Vehicle Free Day-14th
5. Science Day-28th(Dept of Biological Sciences)
6. National Science Day by NSS -28th
7. National Science Day-28th(Women Day)

March 2024

1. World Wild Life Day-3rd (Dept of Biological Sciences)
2. World Sculpt Park Day-19th(Dept of History and English in Collaboration with IQAC)
3. World Sparrow Day-20th (Dept of Biological Sciences)
4. World Oral Health Day-20th (Dept of Biological Sciences)
5. World Forestry Day-21st (Dept of Biological Sciences)
6. World Water Day-22nd (Dept of Biological Sciences)
7. Pantur's Day-23rd (Dept of Biological Sciences)

April 2024

1. World Health Day-7th(Dept of Biological Sciences)
2. Dr. Br. Ambedkar Jayanthi-14th(Dept of Economics & Hist)
3. Vehicle Free Day-15th
4. World Heritage Day-18th(Dept of History)
5. World Earth Day-22nd (Dept of Biological Sciences)
6. English Language Day-23rd
7. World Book Day-23rd (Dept of Biological Sciences)
8. World Malaria Day-25th (Dept of Biological Sciences)

May & June 2024

1. International Yoga Day-21st June(Dept of Biological Sciences)
2. National Endangered Species Day-17th/19th(Dept of Biological Sciences)
3. International Day for Biological Sciences-22nd May(Dept of Biological Sciences)
4. World Environment Day-5th June(Dept of Biological Sciences)
5. No Bag Day-22nd June

LANGUAGE ACTIVITIES

- English Week
- Hindi Diwas
- Telugu Week

We are pleased to announce that St. Ann's College for Women is conducting a range of language development activities to enhance students' communication skills. These initiatives include debates, group discussions, creative writing workshops, and language games, designed to foster speaking, listening, reading, and writing proficiency. Our expert faculty will provide guidance and feedback, ensuring students gain confidence in expressing themselves effectively.


• Day 3: Poem Recitation
• Day 4: Spell Bee
• Day 5: Spell Bee - Semi Finals
• Day 6 : Valedictory


Hindi Diwas
Hindi is adopted as the official language of India.In the year 1949,Hindi diwas celebrates the rich linguistic,and cultural heritage of India and emphasises the importance of country's identity and unity.Promotion of the language and its significane is portrayed


Telugu Week
Every year, our college enthusiastically celebrates Telugu Week on the eve of Telugu Dinothsavam. This annual event serves as a vibrant tribute to the rich Telugu culture, language, and heritage. It provides a platform for students, faculty, and staff to come together and showcase their love for the Telugu language and its traditions.
Day 1:PPT
Day 2:Rally
Day 3: Rangoli & Traditional Dress competitions
Day 4:Closing ceremony

OUTREACH PROGRAMMES

At St. Ann's College for Women, we extend our commitment to social responsibility through our REACH program. This comprehensive outreach initiative focuses on environmental conservation and community engagement.

Our students actively participate in:

- Beach clean rallies
- Tree plantation drives
- Community clean-up initiatives
- Environmental awareness campaigns
- Marathons
- Medical Camps

These programs foster:

- Teamwork and leadership skills
- Civic responsibility and empathy
- Environmental consciousness
- Holistic development

World Beach Cleaning Day (21st September)Importance: World Beach Cleaning Day focuses on preserving marine life and keeping beaches free from pollution, particularly plastics. Oceans and beaches are vital ecosystems, and pollution harms wildlife, marine biodiversity, and humans.

MEDICAL CAMP

The dental camp conducted by the Department of Commerce and Management in association with . It provided essential dental care services and education to the participants. , (A Dental surgeon), supported the event .The event aimed to promote oral health awareness and improve dental hygiene practices. Its a 5-Day program Organized in not only in our campus also schools in and around the locality.


INDEPENDENCE DAY


FRESHERS DAY
2023


Farewell Party


I'S COLL
FOR WOMEN
HAPPY
Teacher's
DAY


Merry Christmas


Happy Pongal

CHALLENGES

- Well equipped departmental rooms
- Changing Policies in Education system
- Infrastructure
- National standards of Play Ground
- Emotional imbalance of the students
- Effect of mass media on youth

Postgraduate Programs:

Introducing PG courses in selected disciplines, enhancing research opportunities.

Collaborations with industry experts and renowned institutions

New Undergraduate Courses:
Expanding UG offerings in emerging fields. Interdisciplinary programs combining Arts, Science, and Commerce.

Global Partnerships:
International collaborations for student exchange programs.
Faculty development opportunities and joint research initiatives

Concluding Remarks

- ✔ St. Ann's College looks at the past with gratitude, live the present with joy and embrace the future with hope.
- ✔ The uniqueness of the college is tangibly experienced in processing high graduation rate, low student to faculty ratio, internships and project opportunities, engaging curriculums, health and wellness facilities, campus safety and extension services, dedicated management with clear vision and mission, space created for the growth of socio-economically poor students, policies for protection of women, inhibitions of spiritual and psychological soundness, career service, quality audits, academic support services, leadership opportunities and healthy alumni network.
- ✔ Growth and transformation of the college's infrastructure has been significant. The addition of carefully planned and designed academic, recreational, and residential infra structural facilities, renovation of existing facilities, creation of multifaceted auditorium, timely maintenance have transformed the campus.