ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION

(A Statutory body of the Government of Andhra Pradesh)

REVISED SYLLABUS OF ENGLISH under (Part – I)
UNDER CBCS FRAMEWORK WITH EFFECT FROM 2020-21

PROGRAMME: THREE-YEAR B.A. /B.Sc./B.Com/BCA/BBM/BHM & CT, etc.

Andhra Pradesh State Council of Higher Education, Mangalagiri, Guntur District

Revised English Syllabus from 2020-21 Onwards

Under Choice Based Credit System

Introduction

The turn of the twenty first century has made the English Language skills a passport to the job market to all job seekers. Ability to communicate well in English has become a hallmark of good educational foundation and a prerequisite for all graduates. The students are expected to possess a measurable knowledge and a set of skills in using English language in personal and professional life. The present course **English Praxis** in three parts offers suitable context to teach, learn and practise target language skills. Each part of the course aims at certain specified skills which are taught through various text-based classroom activities and the English Language Laboratory activities. The syllabus of the course offers an open platform to the teacher to facilitate active participatory learning to the students. Hence the whole course is offered in three semesters. The first part of the course offers fundamentals of the English language in five units: Listening, Speaking, Grammar, Writing and Soft Skills. These introductory units are developed into full length courses in the subsequent semesters in addition to Reading Skills so as to prepare the learner into a fully equipped individual.

In addition to the classroom interaction, the course also aims at language enhancement through various ICT based online and offline activities in the English Language Laboratory. Each Unit is reinforced with Laboratory activities. The College administration will bestow special attention to make the **English Praxis** course an activity oriented one. The innovative methods and creativity of the English faculty will enhance the learners' participation in teaching and learning.

Semester-I English Praxis Course-I : **A Course in Communication and Soft Skills**

Semester-II English Praxis Course -II : **A Course in Reading & Writing Skills**

Semester-III English Praxis Course -III**: A Course in Conversational Skills**

English Syllabus-Semester-I

English Praxis Course-I

A Course in Communication and Soft Skills

Learning Outcomes

By the end of the course the learner will be able to :

- Use grammar effectively in writing and speaking.
- Demonstrate the use of good vocabulary
- Demonstrate an understating of writing skills
- Acquire ability to use Soft Skills in professional and daily life.
- Confidently use the tools of communication skills

I. **UNIT: Listening Skills**
   i. Importance of Listening
   ii. Types of Listening
   iii. Barriers to Listening
   iv. Effective Listening

II. **UNIT: Speaking Skills**
   a. Sounds of English: Vowels and Consonants
   b. Word Accent
   c. Intonation

III. **UNIT: Grammar**
   a) Concord
   b) Modals
   c) Tenses (Present/Past/Future)
   d) Articles
   e) Prepositions
   f) Question Tags
   g) Sentence Transformation (Voice, Reported Speech & Degrees of Comparison)
   h) Error Correction

IV. **UNIT: Writing**
   i. Punctuation
   ii. Spelling
   iii. Paragraph Writing

V. **UNIT: Soft Skills**
   a. SWOC
   b. Attitude
   c. Emotional Intelligence
   d. Telephone Etiquette
   e. Interpersonal Skills

English Syllabus-Semester-II

English Praxis Course-II

A Course in Reading & Writing Skills

Learning Outcomes

By the end of the course the learner will be able to :

- Use reading skills effectively
- Comprehend different texts
- Interpret different types of texts
- Analyse what is being read
- Build up a repository of active vocabulary
- Use good writing strategies
- Write well for any purpose
- Improve writing skills independently for future needs

I. UNIT
Prose	: 1. How to Avoid Foolish Opinions	Bertrand Russell
Skills	: 2. Vocabulary: Conversion of Words	
	: 3. One Word Substitutes	
	: 4. Collocations	

II. UNIT
Prose	: 1. The Doll's House	Katherine Mansfield
Poetry	: 2. Ode to the West Wind	P B Shelley
Non-Detailed Text	: 3. Florence Nightingale	Abrar Mohsin
Skills	: 4. Skimming and Scanning	

III. UNIT
Prose	: 1. The Night Train at Deoli	Ruskin Bond
Poetry	: 2. Upagupta	Rabindranath Tagore
Skills	: 3. Reading Comprehension	
	: 4. Note Making/Taking	

IV. UNIT
Poetry	: 1. Coromandel Fishers	Sarojini Naidu
Skills	: 2. Expansion of Ideas	
	: 3. Notices, Agendas and Minutes	

V.UNIT
Non-Detailed Text	: 1. An Astrologer's Day	R K Narayan
Skills	: 2. Curriculum Vitae and Resume	
	: 3. Letters	
	: 4. E-Correspondence	

English Syllabus-Semester-III

English Praxis Course-III

A Course in Conversational Skills

Learning Outcomes

By the end of the course the learner will be able to :

- Speak fluently in English
- Participate confidently in any social interaction
- Face any professional discourse
- Demonstrate critical thinking
- Enhance conversational skills by observing the professional interviews

I. UNIT

Speech	: 1. Tryst with Destiny	Jawaharlal Nehru
Skills	: 2. Greetings	
	: 3. Introductions	

II. UNIT

Speech	: 1. Yes, We Can	Barack Obama
Interview	: 2. A Leader Should Know How to Manage Failure	
	Dr.A.P.J.Abdul Kalam/ India Knowledge at Wharton	
Skills	: 3. Requests	

III. UNIT

Interview	: 1. Nelson Mandela's Interview	With Larry King
Skills	: 2. Asking and Giving Information	
	: 3. Agreeing and Disagreeing	

IV. UNIT

Interview	: 1. JRD Tata's Interview	With T.N.Ninan
Skills	: 2. Dialogue Building	
	: 3. Giving Instructions/Directions	

V. UNIT

1. **Speech**	: 1. You've Got to Find What You Love	Steve Jobs
Skills	: 2. Debates	
	: 3. Descriptions	
	: 4. Role Play	

SUBJECT EXPERTS

Prof. K.Ratna Shiela Mani,
Department of English,
Acharya Nagarjuna University,
Nagarjuna Nagar.

Dr. I. Vijaya Babu,
Principal,
Government Degree College,
S.Kota, Vizianagaram District– 533255

SYLLABUS VETTED BY

Prof. C.L.L.Jayaprada,
Department of English (Retd),
Andhra University,
Visakhapatnam.

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION

(A Statutory body of the Government of Andhra Pradesh)

3rd,4th and 5thfloors, Neeladri Towers,, Sri Ram Nagar, 6th Battalion Road,
Atmakur (V), Mangalagiri (M), Guntur-522 503, Andhra Pradesh
Web: www.apsche.org **Email**: acapsche@gmail.com

REVISED SYLLABUS OF TELUGU under (Part – I)

UNDER CBCS FRAMEWORK WITH EFFECT FROM 2020-2021

PROGRAMME: THREE-YEAR B.A. /B.Sc./B.Com/BCA/BBM/BHM & CT

(With Learning Outcomes, Unit-wise Syllabus, References, Co-curricular Activities & Model

Q.P.)

For Fifteen Courses of 1, 2, 3 Semesters)

(To be Implemented from 2020-21 Academic Year)

TELUGU

Andhra Pradesh State Council of Higher Education
B.A., B.Com., & B.Sc., etc., Programmes

Revised Syllabus under CBCS Pattern
w.e.f. 2020-21

Language Subjects - TELUGU
Revised Syllabus of
GENERAL TELUGU

ఆంధ్ర ప్రదేశ్ రాష్ట్ర ఉన్నత విద్యామండలి

బి.ఎ., బి.కాం., బి.యస్.సి., తదితర ప్రోగ్రాములు

సి.బి.సి.ఎస్.పద్ధతిలో సవరించబడిన పాఠ్యప్రణాళిక

2020-21 విద్యా సంవత్సరం నుంచి

జనరల్ తెలుగు – పాఠ్య ప్రణాళిక

Subject Curricular Framework

Sem	Course	Title	Hrs/Wk	Credits	Max. Marks IA SE		Total
I I	Pracheena Telugu Kavithvam	04	03	25 75	100		
II II	Aadhunika Telugu Sahithyam	04	03	25 75	100		
III III	Srujanaathmaka Rachana	04	03	25 75	100		

పాఠ్యప్రణాళిక (3 కోర్సులు)

సెమి.	కోర్సు	శీర్షిక	పీరియడ్లు/వారానికి	క్రెడిట్లు	మొత్తం మార్కులు		
I	I	ప్రాచీన తెలుగు కవిత్వం	04	03	25 75	100	
II	II	ఆధునిక తెలుగు సాహిత్యం	04	03	25 75	100	
III	III	సృజనాత్మక రచన	04	03	25 75	100	

బి.ఏ., బి.కాం., బి.యస్సి., తదితర ప్రోగ్రాములు

అంశం: జనరల్ తెలుగు   సెమిస్టర్–1

కోర్సు–1 : ప్రాచీన తెలుగు కవిత్వం

యూనిట్ల సంఖ్య:5   పీరియడ్ల సంఖ్య:60

✦ అభ్యసన ఫలితాలు:–

ఈ కోర్సు విజయవంతంగా ముగించాక, విద్యార్థులు క్రింది అభ్యసన ఫలితాలను పొందగలరు.

1. ప్రాచీన తెలుగుసాహిత్యం యొక్క ప్రాచీనతను, విశిష్టతను గుర్తిస్తారు. తెలుగుసాహిత్యంలో ఆదికవి నన్నయ కాలంనాటి భాషాసంస్కృతులను, ఇతిహాసకాలం నాటి రాజనీతి విషయాలపట్ల పరిజ్ఞానాన్ని సంపాదించగలరు.

2. శివకవుల కాలంనాటి మతపరిస్థితులను, భాషావిశేషాలను గ్రహిస్తారు. తెలుగు నుడికారం, సామెతలు, లోకోక్తులు మొదలైన భాషాంశాల పట్ల పరిజ్ఞానాన్ని పొందగలరు.

3. తిక్కన భారతంనాటి మత, ధార్మిక పరిస్థితులను, తిక్కన కవితాశిల్పాన్ని, నాటకీయతను అవగాహన చేసుకోగలరు.

4. ఎఱ్ఱన సూక్తివైచిత్రిని, ఇతిహాస కవిత్వంలోని విభిన్న రీతులపట్ల అభిరుచిని పొందగలరు. శ్రీనాథుని కాలం నాటి కవితావిశేషాలను, మొల్ల కవితా విశిష్టతను గుర్తించగలరు.

5. తెలుగు పద్యం స్వరూప–స్వభావాలను, సాహిత్యాభిరుచిని పెంపొందించుకుంటారు. ప్రాచీన కావ్యభాషలోని వ్యాకరణాంశాలను అధ్యయనం చేయడం ద్వారా భాషాసామర్ధ్యాన్ని, రచనల మెలకువలను గ్రహించగలరు.

పాఠ్య ప్రణాళిక

యూనిట్-I

రాజనీతి   –   నన్నయ

మహాభారతం–సభాపర్వం–ప్రథమాశ్వాసం–(26–57 పద్యాలు)

యూనిట్-II

దక్షయజ్ఞం   –   నన్నెచోడుడు

కుమారసంభవం–ద్వితీయాశ్వాసం–(49–86 పద్యాలు)

యూనిట్-III

ధౌమ్య ధర్మోపదేశము   – తిక్కన

మహాభారతం–విరాటపర్వం–ప్రథమాశ్వాసం–(116–146) పద్యాలు

యూనిట్-IV

పలనాటి బెబ్బులి   – శ్రీనాథుడు (పలనాటి వీరచరిత్ర–ద్విపద కావ్యం పుట 108–112

'బాలచంద్రుడు భీమంబగు సంగ్రామం బొనర్చుట.. (108)..

..... వెఱగంది కుంది' (112) సం. అక్కిరాజు ఉమాకాంతం

ముద్రణ.వి.కె.స్వామి, బెజవాడ 1911.

యూనిట్-V

సీతారావణ సంవాదం   – మొల్ల

రామాయణము–సుందరకాండము–(40–87 పద్యాలు)

◆వ్యాకరణం

సంధులు: ఉత్వ, త్రిక, ద్రుతప్రకృతిక, నుగాగమ,ద్విరుక్తటకారాదేశ, యణాదేశ, వృద్ధి, శ్చుత్వ,
          జత్వ, అనునాసిక సంధులు.

సమాసాలు: అవ్యయీభావ, తత్పురుష, కర్మధారయ, ద్వంద్వ, ద్విగు, బహుప్రీహి.

అలంకారాలు:

     అర్థాలంకారాలు : ఉపమ, ఉత్ప్రేక్ష, రూపక, స్వభావోక్తి, అర్థాంతరవ్యాస, అతిశయోక్తి.

     శబ్దాలంకారాలు : అనుప్రాస (వృత్యనుప్రాస, ఛేకమప్రాస లాటానుప్రాస, అంత్యానుప్రాస)

ఛందస్సు

     వృత్తాలు: ఉత్పలమాల, చంపకమాల, శార్దూలము, మత్తేభము;

     జాతులు : కందం, ద్విపద; ఉపజాతులు : ఆటవెలది, తేటగీతి, సీసం మరియు ముత్యాలసరాలు

ఆధార గ్రంథాలు:

1. శ్రీమదాంధ్ర మహాభారతము : సభాపర్వము–తిరుమల తిరుపతి దేవస్థానం ప్రచురణ

2. శ్రీమదాంధ్ర మహాభారతము : విరాటపర్వము–తిరుమల తిరుపతి దేవస్థానం ప్రచురణ

3. కుమార సంభవం   – నన్నెచోడుడు

4. పలనాటి వీరచరిత్ర   – శ్రీనాథుడు

5. రామాయణము   – మొల్ల

✦ సూచించబడిన సహపాఠ్య కార్యక్రమాలు:

1. నన్నయ్య, తిక్కన, ఎఱ్ఱన మొదలైన ప్రసిద్ధ కవుల పాఠ్యాంశేతర పద్యాలను ఇచ్చి, విద్యార్థులచేత సమీక్షలు రాయించడం; ఆయా పద్యాల్లోని యతిప్రాసాది ఛందోవిశేషాలను గుర్తింపజేయడం.

2. విద్యార్థులచేత పాఠ్యాంశాలకు సంబంధించిన వ్యాసాలు రాయించడం (సెమినార్/అసైన్మెంట్)

3. ప్రాచీన పాఠ్యాంశాలలోని సమకాలీనతను గూర్చిన బృంద చర్చ, ప్రాచీన సాహిత్యాన్ని నేటి సామాజిక దృష్టితో పునర్మూల్యాంకనం చేయించడం.

4. చారిత్రక, సాంస్కృతిక అంశాలకు సంబంధించిన పర్యాటక ప్రదేశాలను సందర్శించడం.

5. వ్యక్తిగత/బృంద ప్రాజెక్టులు చేయించడం. ప్రశ్నపత్ర నిర్మాతలకు సూచనలు ప్రతిపదార్థ పద్యాలు, కంఠస్థ పద్యాలు "రాజనీతి, దక్షయజ్ఞం, ధౌమ్య ధర్మోపదేశం, సీతారావణ సంవాదం" అనే నాలుగు పాఠ్యాంశాల నుండి మాత్రమే ఇవ్వాలి.

<div align="center">ప్రశ్నపత్ర నమూనా</div>

అ. ప్రతిపదార్థ పద్యాలు–(అంతర్గత ఛాయిస్) (2-1)   1×8=8 మా

ఆ. కంఠస్థ పద్యం–(అంతర్గత ఛాయిస్)   (2-1)   1×3=3 మా

ఇ. సందర్భ వాక్యాలు–   (6-4)   4×3=12 మా

ఈ. సంగ్రహ సమాధాన ప్రశ్నలు   (6-4)   4×3=12 మా

ఉ. వ్యాస ప్రశ్నలు (అంతర్గత ఛాయిస్)   (6-3)   3×8=24 మా

ఊ. వ్యాకరణం–సంధులు   (6-4)   4×1=4 మా

సమాసాలు   (6-4)   4×1=4 మా

అలంకారాలు   (2-1)   1×4=4 మా

ఛందస్సు   (2-1)   1×4=4 మా

బి.ఏ., బి.కాం., బి.యస్.సి., తదితర ప్రోగ్రాములు

అంశం: జనరల్ తెలుగు   సెమిస్టర్–2

కోర్సు–2 : ఆధునిక తెలుగు సాహిత్యం

యూనిట్ల సంఖ్య:5   పీరియడ్ల సంఖ్య:60

✦ అభ్యసన ఫలితాలు:–

ఈ కోర్సు విజయవంతంగా ముగించాక, విద్యార్థులు క్రింది అభ్యసన ఫలితాలను పొందగలరు.

1. ఆంగ్లభాష ప్రభావం కారణంగా తెలుగులో వచ్చిన ఆధునిక సాహిత్యాన్ని, దాని విశిష్టతను గుర్తిస్తారు.

2. సమకాలీన ఆధునిక సాహిత్య ప్రక్రియలైన "వచన కవిత్వం, కథ, నవల, నాటకం, విమర్శ"లపై అవగాహన పొందుతారు.

3. భావకవిత, అభ్యుదయ కవితాలక్ష్యాలను గూర్చిన జ్ఞానాన్ని పొందుతారు.అస్తిత్వవాద ఉద్యమాలపుట్టుకను, ఆవశ్యకతను గుర్తిస్తారు.

4. కథాసాహిత్యం ద్వారా సామాజిక చైతన్యాన్ని పొందుతారు. సిద్ధాంతాల ద్వారా కాకుండా, వాస్తవ పరిస్థితులను తెలుసుకోవడం ద్వారా సిద్ధాంతాన్ని సమీక్షించగలరు.

5. ఆధునిక తెలుగు కల్పనాసాహిత్యం ద్వారా సామాజిక, సాంస్కృతిక,రాజకీయ చైతన్యాన్ని పొందుతారు.

పాఠ్య ప్రణాళిక

యూనిట్–I : ఆధునిక కవిత్వం

1. ఆధునిక కవిత్వం– పరిచయం

2. కొండవీడు   – దువ్వూరి రామిరెడ్డి

             ('కవికోకిల' గ్రంథావళి–ఖండకావ్యాలు–నక్షత్రమాల సంపుటి నుండి)

3. మాతృసంగీతం   – అనిసెట్టి సుబ్బారావు ('అగ్నివీణ' కవితాసంపుటి నుండి)

4. 'తాతకో నూలుపోగు'   – బండారు ప్రసాదమూర్తి ('కలనేత' కవితాసంపుటి నుండి)

యూనిట్–II : కథానిక

5. తెలుగు కథానిక – పరిచయం

6. భయం (కథ)   – కాళీపట్నం రామారావు

7. స్వేదం ఖరీదు....? – (కథ)   – రెంటాల నాగేశ్వరరావు

యూనిట్–III : నవల

8. తెలుగు 'నవల'   – పరిచయం

9. రథచక్రాలు (నవల) – మహీధర రామ్మోహన రావు (సంక్షిప్త ఇతివృత్తం మాత్రం)

10. రథచక్రాలు (సమీక్షా వ్యాసం)   – డా॥ యల్లాప్రగడ మల్లికార్జునరావు

యూనిట్–IV: నాటకం

11. తెలుగు 'నాటకం' – పరిచయం

12. యక్షగానము (నాటిక)   – ఎం.వి.ఎస్. హరనాథరావు.

13. "అపురూప కళారూపాల విధ్వంసదృశ్యం 'యక్షగానము' (సమీక్షా వ్యాసం)"

     –డా॥కందిమళ్ళసాంబశివరావు

యూనిట్–V: విమర్శ

14. తెలుగు సాహిత్య విమర్శ – పరిచయం

15. విమర్శ–స్వరూప స్వభావాలు; ఉత్తమ విమర్శకుడు–లక్షణాలు

ఆధార గ్రంథాలు/వ్యాసాలు:

1. ఆధునిక కవిత్వం-పరిచయం : చూ. 'దృక్పథాలు' పుట 1-22, ఆచార్య ఎస్వీ. సత్యనారాయణ
2. తెలుగు కథానిక-పరిచయం : చూ. మన నవలలు-మన కథానికలు, పుట 118-130,
   ఆచార్య రాచపాళెం చంద్రశేఖర రెడ్డి
3. తెలుగు నవల-పరిచయం : చూ. నవలాశిల్పం, పుట 1-17, వల్లంపాటి వెంకటసుబ్బయ్య
4. తెలుగు నాటకం-పరిచయం : చూ. తెలుగు నాటకరంగం, పుట 17-25 ఆచార్య ఎస్.గంగప్ప
5. తెలుగుసాహిత్య విమర్శ-పరిచయం: చూ.తెలుగుసాహిత్య విమర్శ-నాడు,నేడు పుట 213-217
   తెలుగువాణి, అయిదవ అఖిలభారత తెలుగు మహాసభల ప్రత్యేక సంచిక
   ఆచార్య జి.వి.సుబ్రహ్మణ్యం
6. నూరేళ్ళ తెలుగు నాటక రంగం – ఆచార్య మొదలి నాగభూషణశర్మ
7. నాటకశిల్పం – ఆచార్య మొదలి నాగభూషణశర్మ
8. సాంఘిక నవల-కథన శిల్పం – ఆచార్య సి.మృణాళిని.

✦ సూచించబడిన సహపాఠ్య కార్యక్రమాలు:

1. ఆధునిక కవిత్వానికి సంబంధించిన కొత్త కవితలను/అంశాలను ఇచ్చి, విద్యార్థులచేత
   వాటిమీద అసైన్మెంట్లు రాయించడం
2. పాఠ్యాంశాలకు సంబంధించిన విషయాలపై వ్యాసాలు రాయించడం (సెమినార్/అసైన్మెంట్)
3. తెలుగు సాహిత్యంలోని ప్రసిద్ధ కథలపై, కవితలపై సమీక్షలు రాయించడం.
4. ఆధునిక పద్యనిర్మాణ రచన చేయించడం.
5. విద్యార్థులను బృందాలుగా విభజించి, నాటకలపై/నవలలపై సమీక్షలు రాయించడం.
6. సాహిత్యవ్యాసాలు సేకరించడం, బృందచర్చ నిర్వహించడం, క్షేత్రపర్యటనలు.
7. ప్రసిద్ధల విమర్శావ్యాసాలు చదివించి, వాటిని విద్యార్థుల సొంత మాటల్లో రాయించడం.
8. పాఠ్యాంశాలపై స్వీయ విమర్శావ్యాసాలు రాయించడం.

✦ప్రశ్నపత్ర నమూనా ✦
అ-విభాగము

సంక్షిప్త సమాధాన ప్రశ్నలు – ప్రతి యూనిట్ నుంచి తప్పనిసరిగా ఒక ప్రశ్న ఇస్తూ, మొత్తం ఎనిమిది
పశ్నలు ఇచ్చి, ఐదింటికి సమాధానం రాయమనాలి.   5×5=25 మా.

ఆ-విభాగము

వ్యాసరూప సమాధాన ప్రశ్నలు-ప్రతి యూనిట్ నుంచి తప్పనిసరిగా రెండు ప్రశ్నలు ఇచ్చి ఒక ప్రశ్నకు
సమాధానం రాయమనాలి. మొత్తం ప్రశ్నలు 5.   5×10=50 మా.

✦ మాదిరి ప్రశ్నాపత్రం ✦

అ–విభాగము

క్రింది వానిలో ఐదింటికి సంక్షిప్త సమాధానాలు రాయండి.

ప్రతి సమాధానానికి 5 మార్కులు.   5×5=25 మా.

1. కొండవీడు   5. కథానిక

2. తెలుగు నవల   6. విమర్శ

3. తెలుగు నాటకం   7. అనిసెట్టి సుబ్బారావు

4. ఆధునిక కవిత్వం   8. కాళీపట్నం రామారావు

ఆ–విభాగము

క్రింది వానిలో అన్ని ప్రశ్నలకు సమాధానాలు రాయండి.

ప్రతి సమాధానానికి 10 మార్కులు.   5×10=50 మా.

9. ఆధునిక కవిత్వ ఆవిర్భావ వికాసాలను వివరించండి.

       (లేదా)

    కొండవీడులో దువ్వూరి రామిరెడ్డి గారి సందేశాన్ని వివరించండి.

10. తెలుగు కథానికను పరిచయం చేయండి.

       (లేదా)

    భయం కథలోని రచయిత సందేశాన్ని రాయండి.

11. సాహిత్య ప్రక్రియగా నవల స్థానాన్ని విమర్శించండి.

       (లేదా)

    రథచక్రాలు నవలలోని ఇతివృత్తాన్ని విశ్లేషించండి.

12. తెలుగు నాటక పరిణామాన్ని గూర్చి రాయండి.

       (లేదా)

    యక్షగానం నాటికపై సమీక్షా వ్యాసం రాయండి.

13. తెలుగు సాహిత్య విమర్శను పరిచయం చేయండి

       (లేదా)

    విమర్శ స్వరూప స్వభావాలను వివరిస్తూ, ఉత్తమ విమర్శకుని లక్షణాలను రాయండి.

బి.ఏ., బి.కాం., బి.యస్సి., తదితర ప్రోగ్రాములు

అంశం: జనరల్ తెలుగు సెమిస్టర్–3

కోర్సు–3 : సృజనాత్మక రచన

యూనిట్ల సంఖ్య:5 పీరియడ్ల సంఖ్య:60

✦ అభ్యసన ఫలితాలు:–

ఈ కోర్సు విజయవంతంగా ముగించాక, విద్యార్థులు క్రింది అభ్యసన ఫలితాలను పొందగలరు.

1. తెలుగు సాహిత్య అభ్యసన ద్వారా నేర్చుకున్న నైపుణ్యాలను, సృజనాత్మక నైపుణ్యాలుగా మార్చుకోగలరు.

2. విద్యార్థులు భాషాతత్త్వాన్ని, భాష యొక్క ఆవశ్యకతను, భాష యొక్క ప్రాధాన్యాన్ని గుర్తిస్తారు. మనిషి వ్యక్తిగత జీవనానికి, సామాజికవ్యవస్థ పటిష్ఠతకు భాష ప్రధానమని తెలుసుకుంటారు. తెలుగుభాషలోని కీలకాంశాలైన 'వర్ణం–పదం–వాక్యా'ల ప్రాధాన్యాన్ని గుర్తిస్తూ, వాగ్రూప– లిఖితరూప వ్యక్తీకరణ ద్వారా భాషానైపుణ్యాలను మెరుగుపరచుకోగలరు.

3.భాషానైపుణ్యాలను అలవరచుకోవడంతోపాటు వినియోగించడం నేర్చుకుంటారు. రచనా, భాషణానైపుణ్యాలను సృజనాత్మక రూపంలో వ్యక్తీకరించగలరు.

4. ప్రాచీన పద్యరచనతో పాటు ఆధునిక కవిత, కథ, వ్యాసం, మొదలైన సాహిత్యప్రక్రియల నిర్మాణాలకు సంబంధించిన సిద్ధాంతవిషయాలను నేర్పడంతో పాటు వారిలో రచనా నైపుణ్యాలను పెంపొందించుకోగలరు.

5. సృజన రంగం, ప్రసారమాధ్యమ రంగాల్లో ఉపాధి అవకాశాలను అందిపుచ్చుకోగలరు.

6. అనువాద రంగంలో నైపుణ్యం సంపాదించగలరు.

పాఠ్య ప్రణాళిక

యూనిట్-I: వ్యక్తీకరణ నైపుణ్యాలు

1. భాష-ప్రాథమికాంశాలు: భాష-నిర్వచనం, లక్షణాలు, ఆవశ్యకత, ప్రయోజనాలు

2. వర్ణం-పదం-వాక్యం', వాక్య లక్షణాలు, సామాన్య-సంయుక్త-సంశ్లిష్టవాక్యాలు

3. భాషా నిర్మాణంలో 'వర్ణం-పదం-వాక్యం' ప్రాధాన్యత

యూనిట్-II సృజనాత్మక రచన

4. కవితా రచన   :   ఉత్తమ కవిత – లక్షణాలు

5. కథారచన   :   ఉత్తమ కథ – లక్షణాలు

6. వ్యాస రచన   :   ఉత్తమ వ్యాసం-లక్షణాలు

యూనిట్-III: అనువాద రచన

7. అనువాదం-నిర్వచనం, అనువాద పద్ధతులు,

8. అనువాద సమస్యలు-భౌగోళిక,భాషా,సాంస్కృతిక సమస్యలు, పరిష్కారాలు

9. అభ్యాసము :   ఆంగ్లం నుండి తెలుగుకు,తెలుగు నుండి ఆంగ్లానికి ఒక పేరానుఅనువదించడం

యూనిట్ IV మాధ్యమాలకు రచన-1 (ముద్రణామాధ్యమం/ప్రింట్ మీడియా)

10. ముద్రణామాధ్యమం (అచ్చుమాధ్యమం) : పరిచయం, పరిధి, వికాసం

11. వివిధ రకాల పత్రికలు-పరిశీలన,   పత్రికాభాష, శైలి, వైవిధ్యం

12. పత్రికా రచన : వార్తా రచన, సంపాదకీయాలు, సమీక్షలు-అవగాహన

యూనిట్ V మాధ్యమాలకు రచన-2 (ప్రసార మాధ్యమం/ఎలక్ట్రానిక్ మీడియా)

13. ప్రసారమాధ్యమాలు : నిర్వచనం, రకాలు, విస్తృతి, ప్రయోజనాలు

14. శ్రవణ మాధ్యమాలు – రచన: రేడియో రచన, ప్రసంగాలు, నాటికలు, ప్రసార సమాచారం

15. దృశ్యమాధ్యమాలు – రచన: వ్యాఖ్యానం (యాంకరింగ్), టెలివిజన్ రచన

ఆధార గ్రంథాలు/వ్యాసాలు:

1. వ్యక్తీకరణ నైపుణ్యాలు – చూ. 1. ఆధునిక భాషాశాస్త్ర సిద్ధాంతాలు–ఆచార్య పి.ఎస్.సుబ్రహ్మణ్యం

                             2. తెలుగు భాషా చరిత్ర – సం.ఆచార్య భద్రిరాజు కృష్ణమూర్తి

                             3. తెలుగు వాక్యం – డా. చేకూరి రామారావు

2. ఉత్తమ కవిత–లక్షణాలు – చూ. నవ్యకవిత్వ లక్షణములు– ఆచార్య సి.నారాయణరెడ్డి

                          ఆధునికాంధ్ర కవిత్వము–సంప్రదాయములు, ప్రయోగములు: చతుర్థ ప్రకరణము.

3. ఉత్తమ కథ–లక్షణాలు – చూ.కథాశిల్పం–వల్లంపాటి వెంకటసుబ్బయ్య, పుటలు 11–17

4. ఉత్తమ వ్యాసం–లక్షణాలు– చూ.చదువు–సంస్కృతి (వ్యాసం) – కొడవటిగంటి కుటుంబరావు

5. అనువాద రచన – చూ.1. అనువాద సమస్యలు – రాచమల్లు రామచంద్రారెడ్డి

                        పుటలు 61–75, 85–94

                        2. అనువాదన పద్ధతులు ఆచరణ సమస్యలు–చేకూరి రామారావు

                      "భాషాంతరంగం", పుటలు 130–146, తెలుగు విశ్వవిద్యాలయం ప్రచురణ

6. ముద్రణా మాధ్యమం – చూ. మాధ్యమాలకు రచన, పుటలు 9–12

                        – డా॥ బి.ఆర్.అంబేద్కర్ విశ్వవిద్యాలయ ప్రచురణ

7. పత్రికా భాష – చూ. మాధ్యమాలకు రచన, పుటలు 67–74

                        – డా॥ బి.ఆర్.అంబేద్కర్ విశ్వవిద్యాలయ ప్రచురణ

8. పత్రికా రచన – చూ. తెలుగు– మౌలికాంశాలు, పుటలు 59–69

                        – డా॥ బి.ఆర్.అంబేద్కర్ విశ్వవిద్యాలయ ప్రచురణ

9. ప్రసార మాధ్యమాలు – చూ. మాధ్యమాలకు రచన, పుటలు 3-10

                        – డా॥ బి.ఆర్.అంబేద్కర్ విశ్వవిద్యాలయ ప్రచురణ

10. రేడియో రచన – చూ.మాధ్యమాలకు రచన, పుటలు 141-148

                        – డా॥ బి.ఆర్.అంబేద్కర్ విశ్వవిద్యాలయ ప్రచురణ

11. వ్యాఖ్యానం (యాంకరింగ్) – చూ.మాధ్యమాలకు రచన, పుటలు 178-181

                        – డా॥ బి.ఆర్.అంబేద్కర్ విశ్వవిద్యాలయ ప్రచురణ

12. టెలివిజన్ రచన – చూ.మాధ్యమాలకు రచన, పుటలు 153-160

                        – డా॥ బి.ఆర్.అంబేద్కర్ విశ్వవిద్యాలయ ప్రచురణ

13. తెలుగు జర్నలిజం – డా॥ బూదరాజు రాధాకృష్ణ

సూచించబడిన సహపాఠ్య కార్యక్రమాలు

1. భాషాంశాలపై, వాక్య నిర్మాణంపై అసైన్మెంట్లు రాయించడం, పత్రికల్లోని సాహిత్య/భాషాంశాలను సేకరింపజేయడం.

2. విద్యార్థులచేత తెలుగుభాషా సాహిత్యాలపై ప్రసంగవ్యాసం ఇప్పించడం (సెమినార్/ అసైన్మెంట్)

3. వ్యాసరచన, లేఖారచన, స్వీయకవితలు రాయించి, తరగతిలో చదివింపచేయడం మొదలైనవి.

4. వివిధ కార్యక్రమాల్లో విద్యార్థులచేత సదస్సు నిర్వహణ, వ్యాఖ్యానం (యాంకరింగ్) చేయించడం.

5. సమకాలీన భాషాసమస్యలపై / ఉద్యమాలపై/సాంఘిక సమస్యలపై 'బృందచర్చ'

   (Group Discussion) నిర్వహింపచేయడం.

6. తెలుగుభాషా దినోత్సవం/అంతర్జాతీయ మాతృభాషా దినోత్సవం మొదలైన రోజుల్లో జరిగే సాంస్కృతిక కార్యక్రమాలు విద్యార్థులచేత నిర్వహింపజేయడం, వాటిపై సమీక్షలు/పత్రికా ప్రకటనలు రాయించడం.

7. సమకాలీన సంఘటనలపై సామాజిక మాధ్యమాల్లో/ టి.వి.ల్లో జరిగే చర్చలను నమోదు చేయించి సంకలనం చేయడం.

8. సాంస్కృతిక / చారిత్రక ప్రాశస్త్యం కలిగిన కట్టడాలు, దేవాలయాలు, కళానిలయాలను 'బృందపర్యటన/ క్షేత్ర పర్యటన' ద్వారా విద్యార్థులచేత సందర్శింపజేయడం.

✦ప్రశ్నాపత్ర నమూనా ✦
అ-విభాగము

సంక్షిప్త సమాధాన ప్రశ్నలు – ప్రతి యూనిట్ నుంచి తప్పనిసరిగా ఒక ప్రశ్న ఇస్తూ, మొత్తం ఎనిమిది ప్రశ్నలు ఇచ్చి, ఐదింటికి సమాధానం రాయమనాలి.   5×5=25 మా.

ఆ-విభాగము

వ్యాసరూప సమాధాన ప్రశ్నలు-ప్రతి యూనిట్ నుంచి తప్పనిసరిగా రెండు ప్రశ్నలు ఇచ్చి ఒక ప్రశ్నకు సమాధానం రాయమనాలి. మొత్తం ప్రశ్నలు 5.   5×10=50 మా.

✦ మాదిరి ప్రశ్నాపత్రం ✦

అ–విభాగము

క్రింది వానిలో ఐదింటికి సంక్షిప్త సమాధానాలు రాయండి. 8వ ప్రశ్నకు తప్పనిసరిగా సమాధానం రాయాలి. ప్రతి సమాధానానికి 5 మార్కులు.   5×5=25 మా.

1. భాష–ప్రయోజనాలు   2. వాక్యం–లక్షణాలు   3. టెలివిజన్ రచన   4. రేడియో రచన

5. ఉత్తమ వ్యాసం–లక్షణాలు   6. సంశ్లిష్ట వాక్యం   7. సంపాదకీయాలు

8. క్రింది అంశాన్ని తెలుగులోకి అనువదించి రాయండి.

To many, Indian thought, Indian manners, Indian customs, Indian Philoshophy, Indian Literature are repulsive at the first sight; but let them preservere, let them read, let them become familiar with the great principles underlying these ideas, and it is ninety-nine to one that the charm will come over them, and fascination will be the result. Slow and silent, as the gentle dew that falls in the morning, unseen and unheard yet producing, a most tremendous result, has been the work of the calm, patient, all-suffering spiritual race upon the World of thought.

ఆ–విభాగము

క్రింది వానిలో అన్ని ప్రశ్నలకు సమాధానాలు రాయండి.

ప్రతి సమాధానానికి 10 మార్కులు.   5×10=50 మా.

9. భాషానిర్మాణంలో 'వర్ణం–పదం–వాక్యా'ల ప్రాధాన్యతను వివరించండి. (లేదా)

    భాషను నిర్వచించి, లక్షణాలు రాసి, ప్రామాణిక భాషను పరిచయం చేయండి.

10. ఉత్తమ కవితా లక్షణాలను విశ్లేషించండి.

          (లేదా)

    ఉత్తమ కథా లక్షణాలను వివరించండి.

11. అనువాద సమస్యలను, వాటి పరిష్కారాలను గూర్చి రాయండి.

          (లేదా)

    అనువాద లక్షణాలను వివరిస్తూ, అనువాద పద్ధతులను గురించి రాయండి.

12. ముద్రణా మాధ్యమాన్ని పరిచయం చేస్తూ; దాని పరిధి, వికాసాలను వివరించండి.

          (లేదా)

    పత్రికా రచనను గురించి విశ్లేషణాత్మక వ్యాసం రాయండి.

13. ప్రసార మాధ్యమాల విస్తృతి, ప్రయోజనాలను సమీక్షించండి.

          (లేదా)

    యాంకరింగ్ నిర్వహణ, తీరుతెన్నులను వివరించండి.

SUBJECT EXPERTS

Prof.N.V.Krishna Rao
Dept of Telugu,
Acharya Nagarjuna University,
Nagarjuna Nagar

Dr.K.N.Sundareswara Rao,
Govt. College for Men(Autonomous),
Kadapa

SYLLABUS VETTED BY

Prof.S.Rajeswari,
Dept of Telugu Studies,
S V University,
Tirupati

ANDHA UNIVERSITY

I B.A.,/B.Com.,/B.Sc., SEMESTER – I : GENERAL HINDI PAPER – I

w.e.f. 2020-21

(Prose, Short Stories and Grammar)

Credits : 03   Teaching Hrs/Week : 04

SYLLABUS

गद्य संदेश (PROSE)

१. भारतीय साहित्य की एकता - नन्द दुलारे वाजपायी

२. आत्मनिर्भरता   - पं. बालकृष्ण भट्ट

३. अन्दर की पवित्रता   - डॉ. हजारी प्रसाद द्विवेदी

कथा लोक (SHORT STORIES)

४. ठाकुर का कुआँ   - प्रेमचंद

१. वापसी   - उषा प्रियंवदा

२. सदाचार का तावीज   - हरिशंकर परसाई

व्याकरण (GRAMMAR)

लिंग, वचन,

काल

विलोम शब्द

कार्यालयीन शब्दावली - अंग्रेजी से हिन्दी, हिन्दी से अंग्रेजी

पत्र लेखन - व्यक्तिगत पत्र (छुट्टी पत्र , पिता, मित्र के नाम पत्र, पुस्तक
         विक्रेता के नाम पत्र)

ANDHRA UNIVERSITY

I B.A.,/B.Com.,/B.Sc., SEMESTER – I : GENERAL HINDI PAPER – I

w.e.f. 2020-21

(**Prose, Short Stories and Grammar)**

Time : 3hrs   Max Marks :75

MODEL QUESTION PAPER

PART - A

I.   किन्ही पाँच प्रश्नों के उत्तर दीजिए | 5 X 5 = 25

Short Q & ANS

1. Annotation - Prose

2. Annotation - Prose

3. Short Question - Prose

4. Short Question - Short Stories(Non-detailed)

5. Short Question - Short Stories(Non-detailed)

6. Short Question - Short Stories(Non-detailed)

7. Short Question – Grammar

8. Short Question - Grammar

PART - B

II.   निम्न लिखित सभी प्रश्नों के उत्तर दीजिए | 5 X10 = 50

1.   PROSE

(अथवा)

PROSE

2. PROSE

(अथवा)

Short Stories(Non-detailed)

3. Short Stories(Non-detailed)

(अथवा)

Short Stories(Non-detailed)

4. LETTER WRITING   पत्र लेखन

(अथवा)

LETTER WRITING   पत्र लेखन

5. a) निम्न लिखित शब्दों के विलोम शब्द लिखिए |

1.   2.   3.   4.   5.   6.   7.   8.   9.   10

b) काल

(अथवा)

निम्न लिखित अंग्रेजी शब्दों का हिन्दी में अनुवाद कीजिए |

(a) 1. Part time   2. Memorandum   3. Conference   4. Certificate   5. Circular

(b) निम्न लिखित हिन्दी शब्दों का अंग्रेजी में अनुवाद कीजिए

6. चुनाव   7. सचिव   8. लेखाकार   9. राज्यपाल   10. नगर निगम

ANDHRA UNIVERSITY

II B.A.,/B.Com.,/B.Sc., SEMESTER – II : GENERAL HINDI PAPER – I

2020-21

(Prose, Short Stories, Grammar and Letter writing)

Credits : 03   Teaching Hrs/Week : 4

SYLLABUS

गद्य संदेश (PROSE)

१. भारत में संस्कृति संगम - राम्धारी सिंह दिनकर

३. समय पर मिलाने वाले   - हरिशंकर परसाई

२. HIV /AIDS

कथा लोक (SHORT STORIES)

३. हार की जीत   - सुदर्शन

४. पुरस्कार   - जयशंकर प्रसाद

५. सेवा   - ममता कालिया

व्याकरण (GRAMMAR)

कार्यालयीन हिन्दी शब्दावली - अंग्रेजी से हिन्दी, हिन्दी से अंग्रेजी

पदनाम

कारक,

पत्र लेखन (आवेदन पत्र, शिकायती पत्र)

ANDHRA UNIVERSITY
II B.A.,/B.Com.,/B.Sc., SEMESTER – II : GENERAL HINDI PAPER – I
w.e.f.2020-21
(Prose, Short Stories, Grammar and Letter writing)

Time : 3hrs   Max Marks :75

MODEL QUESTION PAPER

PART - A

I.   किन्ही पाँच प्रश्नों के उत्तर दीजिए | 5 X 5 = 25

   Short Q & ANS

9. Annotation - Prose

10. Annotation - Prose

11. Short Question - Prose

12. Short Question - Short Stories(Non-detailed)

13. Short Question - Short Stories(Non-detailed)

14. Short Question - Short Stories(Non-detailed)

15. Short Question - Grammar

16. Short Question - Grammar

PART - B

II.   निम्न लिखित सभी प्रश्नों के उत्तर दीजिए | 5 X10 = 50

17. PROSE

                  (अथवा)

     PROSE

18. PROSE

                  (अथवा)

   Short Stories(Non-detailed)

19.   Short Stories(Non-detailed)

                  (अथवा)

   Short Stories(Non-detailed)

20. LETTER WRITING   पत्र लेखन (आवेदन पत्र, शिकायती पत्र)

                  (अथवा)

   LETTER WRITING   पत्र लेखन

21. कारक कितने प्रकार के हैं ? समझाइए |

(अथवा)

a) निम्न लिखित हिन्दी शब्दों का अंग्रेजी में अनुवाद कीजिए |

    1.   2.   3.   4.   5.

b) निम्न लिखित हिन्दी पदनामों का अंग्रेजी में अनुवाद कीजिए |

    1.   2.   3.   4.   5.

Signature of the members

ANDHRA UNIVERSITY
II B.A.,/B.Com.,/B.Sc., SEMESTER – III : GENERAL HINDI PAPER – II
w.e.f. 2022-23
(Old & Modern Poetry, History of Hindi Literature, Essays, Translation and Official Letters)

Credits : 03   Teaching Hrs/Week : 4

SYLLABUS

1.**काव्यदीप :** साखी - १-१०

सूरदास - बाल वर्णन

आगे बढ़, आगे - मैथिलीशरण गुप्त

भिक्षुक   - निराला

चरण चले, ईमान अचल हो ! - माखनलाल चतुर्वेदी

2. **हिन्दी साहित्य का इतिहास** :

भक्तिकाल : स्वर्ण युग

ज्ञानाश्रयी शाखा - कबीर, प्रेमाश्रयी शाखा - जायसी

3.**साधारण निबंध :**

नारी शिक्षा का महत्त्व

प्रदूषण का खतरा

विश्व भाषा के रूप में हिन्दी

भारत की वर्तमान समस्याएँ

स्वच्छ भारत

4.**अनुवाद** : अंग्रेजी से हिन्दी **(** 3-4 lines)

तेलुगु से हिन्दी

5.**प्रयोजन मूलक हिन्दी** : सरकारी पत्र (Official letters)

ज्ञापन, परिपत्र, सूचना

ANDHRA UNIVERSITY

II B.A.,/B.Com.,/B.Sc., SEMESTER – III : GENERAL HINDI PAPER – II

w.e.f. 2022-23

(Old & Modern Poetry, History of Hindi Literature, Essays, Translation and Official Letters)

Time : 3hrs   Max Marks :75

MODEL QUESTION PAPER

PART - A

II.   किन्ही पाँच प्रश्नों के उत्तर दीजिए | 5 X 5 = 25
Short Q & ANS

1. .Annotation – Old Poetry
2. Annotation - Old Poetry
3. Annotation - Modern Poetry
4. Annotation - Modern Poetry
5. Short Question – Old Poetry
6. Short Question - Modern Poetry
7. Short Question - Official Letter (Functional Hindi)
8. Short Question – History of Hindi Literature

PART - B

II. निम्न लिखित सभी प्रश्नों के उत्तर दीजिए | 5 X10 = 50

9.   Modern Poetry – Summary

(अथवा)

Modern Poetry – Summary

10. History of Hindi Literature

(अथवा)

History of Hindi Literature

11. Translation (English to Hindi)

(अथवा)

Translation (Telugu to Hindi)

12. General Essay

(अथवा)

General Essay

13. Official Letter (Functional Hindi)

(अथवा)

Official Letter (Functional Hindi)

Signature of the members

ANDHRA UNIVERSITY

II B.A.,/B.Com.,/B.Sc., SEMESTER–IV : GENERAL HINDI PAPER – II

w.e.f. 2022-23

(**Old & Modern Poetry, History of Hindi Literature, Essays, Translation and Official Letters**)

Credits : 03   Teaching Hrs/Week : 4

SYLLABUS

1.**काव्यदीप :** तुलसी दास के दोहे (१-१०)

रहीम के दोहे (१-१०)

सुख - दुःख - सुमित्रानंदन पंत

कलम और तलवार - रामधारी सिंह दिनकर

भारत   - जयशंकर प्रसाद

2. हिन्दी साहित्य का इतिहास :

भक्तिकाल : रामभक्ति शाखा - तुलसी दास,

कृष्ण भक्ति शाखा - सूर दास

3.साधारण निबंध :   समाज में नारी का स्थान,

भाषा की समस्या,

मेरा प्रिय कवि/ साहित्यकार

विज्ञान से हानि - लाभ,

राष्ट्र - निर्माण में विद्यार्थियों का योगदान

4.<u>अनुवाद</u> : अंग्रेजी से हिन्दी **(** 3-4 lines)

तेलुगु से हिन्दी

5.<u>प्रयोजन मूलक हिन्दी</u> : सरकारी पत्र (Official letters)

अधि सूचना, अर्ध सरकारी पत्र, नीलाम

ANDHRA UNIVERSITY

II B.A.,/B.Com.,/B.Sc., SEMESTER–IV : GENERAL HINDI PAPER – II
w.e.f.2022-23

(**Old & Modern Poetry, History of Hindi Literature, Essays, Translation and Official Letters**)

Time : 3hrs   Max Marks :75

MODEL QUESTION PAPER

PART - A

III.   किन्ही पाँच प्रश्नों के उत्तर दीजिए | 5 X 5 = 25

Short Q & ANS

14. .Annotation – Old Poetry

15. Annotation - Old Poetry

16. Annotation - Modern Poetry

17. Annotation - Modern Poetry

18. Short Question – Old Poetry

19. Short Question - Modern Poetry

20. Short Question - Official Letter (Functional Hindi)

21. Short Question – History of Hindi Literature

PART - B

II.   निम्न लिखित सभी प्रश्नों के उत्तर दीजिए | 5 X10 = 50

22. Modern Poetry – Summary

(अथवा)

Modern Poetry – Summary

23. History of Hindi Literature

(अथवा)

History of Hindi Literature

24. Translation (English to Hindi)

(अथवा)

Translation (Telugu to Hindi)

25. General Essay

(अथवा)

General Essay

26. Official Letter (Functional Hindi)
(अथवा)
Official Letter (Functional Hindi)

Signature of the Members
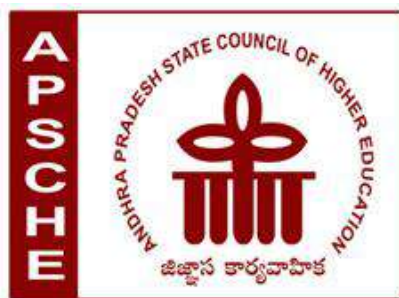
ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION

(A Statutory body of the Government of Andhra Pradesh)

3rd,4th and 5th floors, Neeladri Towers, Sri Ram Nagar, 6th Battalion Road,
Atmakur(V), Mangalagiri(M), Guntur-522 503, Andhra Pradesh
Web: www.apsche.org **Email**: acapsche@gmail.com

REVISED SYLLABUS OF B.A. /B.Sc. MATHEMATICS UNDER CBCS FRAMEWORK WITH EFFECT FROM 2020-2021

PROGRAMME: THREE-YEAR B.A. /B.Sc. MATHEMATICS

(With Learning Outcomes, Unit-wise Syllabus, References, Co-curricular Activities & Model Q.P.)

For Fifteen Courses of 1, 2, 3 & 4 Semesters)

(To be Implemented from 2020-21 Academic Year)

A.P. STATE COUNCIL OF HIGHER EDUCATION

B.A./B.Sc. MATHEMATICS

REVISED SYLLABUS FOR CORE COURSES

CBCS/ SEMESTER SYSTEM
(w.e.f. 2020-21 Admitted Batch)

CORE COURSES STRUCTURE
(Sem-I to Sem-IV)

Course	Subject	Hrs.	Credits	IA	ES	Total
Course -I	Differential Equations & Differential Equations Problem Solving Sessions	6	5	25	75	100
Course -II	Three dimensional analytical Solid geometry & Three dimensional analytical Solid Geometry Problem Solving Sessions	6	5	25	75	100
Course -III	Abstract Algebra & Abstract Algebra Problem Solving Sessions	6	5	25	75	100
Course -IV	Real Analysis & Real Analysis Problem Solving Sessions	6	5	25	75	100
Course -V	Linear Algebra & Linear Algebra Problem Solving Sessions	6	5	25	75	100

B.A./B.Sc. MATHEMATICS (w.e.f. 2020-21 Admitted Batch)
DIFFERENTIAL EQUATIONS
SYLLABUS (75 Hours)

Course Outcomes:

After successful completion of this course, the student will be able to;

1. Solve linear differential equations

2. Convertnonexact homogeneous equations to exact differential equations by using integrating factors.

3. Know the methods of finding solutions ofdifferential equations of the firstorder but not of the firstdegree.

4. Solvehigher-order linear differential equations, both homogeneous and non homogeneous, with constant coefficients.

5. Understand the concept and apply appropriate methods for solving differential equations.

Course Syllabus:

UNIT – I (12 Hours)

Differential Equations of first order and first degree:

Linear Differential Equations; Differential equations reducible to linear form; Exact differential equations; Integrating factors; Change of variables.

UNIT – II (12 Hours)

Orthogonal Trajectories

Differential Equations of first order but not of the first degree:

Equations solvable for p; Equations solvable for y; Equations solvable for x; Equations that do not contain x (or y); Equations homogeneous in x and y;Equations of the first degree in x and y – Clairaut's Equation.

UNIT – III (12 Hours)

Higher order linear differential equations-I:

Solution of homogeneous linear differential equations of order n with constant coefficients; Solution of the non-homogeneous linear differential equations with constant coefficients by means of polynomial operators.General Solution of f(D)y=0.

General Solution of f(D)y=Q when Q is a function of x, $\dfrac{1}{f(D)}$ is expressed as partial fractions.

P.I. of f(D)y = Q when Q= be^{ax}

P.I. of f(D)y = Q when Q is bsinax or b cos ax.

UNIT – IV (12 Hours)

Higher order linear differential equations-II:

Solution of the non-homogeneous linear differential equations with constant coefficients.

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 is a function of x.

P.I. of f(D)y = Q when Q= xV , where V is a function of x.

P.I. of f(D)y = Q when Q= $x^{m}V$, where V is a function of x.

UNIT –V (12 Hours)

Higher order linear differential equations-III :

Method of variation of parameters; Linear differential Equations with non-constant coefficients; The Cauchy-Euler Equation, Legendre's linear equations, miscellaneous differential equations.

Co-Curricular Activities(15 Hours)

Seminar/ Quiz/ Assignments/ Applications of Differential Equations to Real life Problem /Problem Solving.

Text Book :

Differential Equations and Their Applications by Zafar Ahsan, published by Prentice-Hall of India Pvt. Ltd, New Delhi-Second edition.

Reference Books :

1. A text book of Mathematics for B.A/B.Sc, Vol 1, by N. Krishna Murthy & others, published by S.Chand & Company, New Delhi.

2. Ordinary and Partial Differential Equations by Dr. M.D,Raisinghania, published by S. Chand & Company, New Delhi.

3.Differential Equations with applications and programs – S. Balachandra Rao & HR Anuradha-Universities Press.

4. Differential Equations -Srinivas Vangala & Madhu Rajesh, published by Spectrum University Press.

CBCS/ SEMESTER SYSTEM

(w.e.f. 2020-21 Admitted Batch)

B.A./B.Sc. MATHEMATICS

THREE DIMENSIONAL ANALYTICAL SOLID GEOMETRY

Syllabus (75 Hours)

Course Outcomes:

After successful completion of this course, the student will be able to;

1. get the knowledge of planes.

2. basic idea of lines, sphere and cones.

3. understand the properties of planes, lines, spheres and cones.

4**.** express the problems geometrically and then to get the solution.

Course Syllabus:

UNIT – I (12 Hours)

The Plane :

Equation of plane in terms of its intercepts on the axis, Equations of the plane through the given points, Length of the perpendicular from a given point to a given plane, Bisectors of angles between two planes, Combined equation of two planes, Orthogonal projection on a plane.

UNIT – II (12 hrs)

The Line :

Equation of a line; Angle between a line and a plane; The condition that a given line may lie in a given plane; The condition that two given lines are coplanar; Number of arbitrary constants in the equations of straight line; Sets of conditions which determine a line; The shortest distance between two lines; The length and equations of the line of shortest distance between two straight lines; Length of the perpendicular from a given point to a given line.

UNIT – III (12 hrs)

The Sphere :

Definition and equation of the sphere; Equation of the sphere through four given points; Plane sections of a sphere; Intersection of two spheres; Equation of a circle; Sphere through a given circle;

Intersection of a sphere and a line; Power of a point; Tangent plane; Plane of contact; Polar plane; Pole of a Plane; Conjugate points; Conjugate planes;

UNIT – IV (12 hrs)

The Sphere and Cones :

Angle of intersection of two spheres; Conditions for two spheres to be orthogonal; Radical plane; Coaxial system of spheres; Simplified from of the equation of two spheres.

Definitions of a cone; vertex; guiding curve; generators; Equation of the cone with a given vertex and guiding curve; equations of cones with vertex at origin are homogenous; Condition that the general equation of the second degree should represent a cone;

UNIT – V (12 hrs)

Cones :

Enveloping cone of a sphere; right circular cone: equation of the right circular cone with a given vertex, axis and semi vertical angle: Condition that a cone may have three mutually perpendicular generators; intersection of a line and a quadric cone; Tangent lines and tangent plane at a point; Condition that a plane may touch a cone; Reciprocal cones; Intersection of two cones with a common vertex.

Co-Curricular Activities(15 Hours)

Seminar/ Quiz/ Assignments/Three dimensional analytical Solid geometry and its applications/ Problem Solving.

Text Book :

Analytical Solid Geometry by Shanti Narayan and P.K. Mittal, published by S. Chand & Company Ltd. 7th Edition.

Reference Books :

1. A text book of Mathematics for BA/B.Sc Vol 1, by V Krishna Murthy & Others, published by S. Chand & Company, New Delhi.

2. A text Book of Analytical Geometry of Three Dimensions, by P.K. Jain and Khaleel Ahmed, published by Wiley Eastern Ltd., 1999.

3. Co-ordinate Geometry of two and three dimensions by P. Balasubrahmanyam, K.Y. Subrahmanyam, G.R. Venkataraman published by Tata-MC Gran-Hill Publishers Company Ltd., New Delhi.

4. Solid Geometry by B.Rama Bhupal Reddy, published by Spectrum University Press.

CBCS/ SEMESTER SYSTEM

(w.e.f. 2020-21 Admitted Batch)

B.A./B.Sc. MATHEMATICS

ABSTRACT ALGEBRA

SYLLABUS (75 Hours)

Course Outcomes:

After successful completion of this course, the student will be able to;

1.acquire the basic knowledge and structure of groups, subgroups and cyclic groups.

2. get the significance of the notation of a normal subgroups.

3. get the behavior of permutations and operations on them.

4. study the homomorphisms and isomorphisms with applications.

5.understand the ring theory concepts with the help of knowledge in group theory and to prove the
theorems.

6. understand the applications of ring theory in various fields.

Course Syllabus:

UNIT – I (12 Hours)

GROUPS :

Binary Operation – Algebraic structure – semi group-monoid – Group definition and elementary properties Finite and Infinite groups – examples – order of a group, Composition tables with examples.

UNIT – II (12 Hours)

SUBGROUPS :

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 a subgroup-union and Intersection of subgroups.

Co-sets and Lagrange's Theorem :

Cosets Definition – properties of Cosets–Index of a subgroups of a finite groups–Lagrange's Theorem.

UNIT –III (12 Hours)

NORMAL SUBGROUPS :

Definition of normal subgroup – proper and improper normal subgroup–Hamilton group – criterion for a subgroup to be a normal subgroup – intersection of two normal subgroups – Sub group of index 2 is a normal sub group –quotient group – criteria for the existence of a quotient group.

HOMOMORPHISM :

Definition of homomorphism – Image of homomorphism elementary properties of homomorphism – Isomorphism – automorphism definitions and elementary properties–kernel of a homomorphism – fundamental theorem on Homomorphism and applications.

UNIT – IV (12 Hours)

PERMUTATIONS AND CYCLIC GROUPS :

Definition of permutation – permutation multiplication – Inverse of a permutation – cyclic permutations – transposition – even and odd permutations – Cayley's theorem.

Cyclic Groups :- Definition of cyclic group – elementary properties – classification of cyclic groups.

UNIT – V (12 Hours)

RINGS :

Definition of Ring and basic properties, Boolean Rings, divisors of zero and cancellation laws Rings, Integral Domains, Division Ring and Fields, The characteristic of a ring - The characteristic of an Integral Domain, The characteristic of a Field. Sub Rings, Ideals

Co-Curricular Activities(15 Hours)

Seminar/ Quiz/ Assignments/ Group theory and its applications / Problem Solving.

Text Book :

A text book of Mathematics for B.A. / B.Sc. by B.V.S.S. SARMA and others, published by S.Chand & Company, New Delhi.

Reference Books :

1. Abstract Algebra by J.B. Fraleigh, Published by Narosa publishing house.

2. Modern Algebra by M.L. Khanna.

3. Rings and Linear Algebra by Pundir & Pundir, published by Pragathi Prakashan.

COURSE-IV
CBCS/ SEMESTER SYSTEM
(w.e.f. 2020-21 Admitted Batch)
B.A./B.Sc. MATHEMATICS
REAL ANALYSIS
SYLLABUS (75 Hours)

Course Outcomes:

After successful completion of this course, the student will be able to

1. get clear idea about the real numbers and real valued functions.
2. obtain the skills of analyzing the concepts and applying appropriate methods for testing convergence of a sequence/ series.
3. test the continuity and differentiability and Riemann integration of a function.
4. know the geometrical interpretation of mean value theorems.

Course Syllabus:

UNIT – I (12 Hours)

REAL NUMBERS :

     The algebraic and order properties of R, Absolute value and Real line, Completeness property of R, Applications of supremum property; intervals. (No question is to be set from this portion).

Real Sequences:

Sequences and their limits, Range and Boundedness of Sequences, Limit of a sequence and Convergent sequence. The Cauchy's criterion, properly divergent sequences, Monotone sequences, Necessary and Sufficient condition for Convergence of Monotone Sequence, Limit Point of Sequence, Subsequences and the Bolzano-weierstrass theorem – Cauchy Sequences – Cauchy's general principle of convergence theorem.

UNIT –II (12 Hours)

INFINITIE SERIES :

Series : Introduction to series, convergence of series. Cauchy's general principle of convergence for series tests for convergence of series, Series of Non-Negative Terms.

1. P-test
2. Cauchy's n^{th} root test or Root Test.

3. D'-Alemberts' Test or Ratio Test.

4. Alternating Series – Leibnitz Test.

Absolute convergence and conditional convergence.

UNIT – III (12 Hours)

CONTINUITY :

　　　Limits : Real valued Functions, Boundedness of a function, Limits of functions. Some extensions of the limit concept, Infinite Limits. Limits at infinity. (No question is to be set from this portion).

Continuous functions : Continuous functions, Combinations of continuous functions, Continuous Functions on intervals, uniform continuity.

UNIT – IV (12 Hours)

DIFFERENTIATION AND MEAN VALUE THEORMS :

　　　The derivability of a function, on an interval, at a point, Derivability and continuity of a function, Graphical meaning of the Derivative, Mean value Theorems; Rolle's Theorem, Lagrange's Theorem, Cauchy's Mean value Theorem

UNIT – V (12 Hours)

RIEMANN INTEGRATION :

Riemann Integral, Riemann integral functions, Darboux theorem. Necessary and sufficient condition for R – integrability, Properties of integrable functions, Fundamental theorem of integral calculus, integral as the limit of a sum, Mean value Theorems.

Co-Curricular Activities(15 Hours)

Seminar/ Quiz/ Assignments/ Real Analysis and its applications / Problem Solving.

Text Book:

      Introduction to Real Analysis by Robert G.Bartle and Donlad R. Sherbert, published by John Wiley.

Reference Books:

1.A Text Book of B.Sc Mathematics by B.V.S.S. Sarma and others, published by S. Chand & Company
   Pvt. Ltd., New Delhi.

2.Elements of Real Analysis as per UGC Syllabus by Shanthi Narayan and Dr. M.D. Raisinghania,
   published by S. Chand & Company Pvt. Ltd., New Delhi.

COURSE-V
CBCS/ SEMESTER SYSTEM
(w.e.f. 2020-21 Admitted Batch)
B.A./B.Sc. MATHEMATICS
LINEAR ALGEBRA
SYLLABUS (75 Hours)

Course Outcomes:

After successful completion of this course, the student will be able to;

1. understand the concepts of vector spaces, subspaces, basises, dimension and their properties
2. understand the concepts of linear transformations and their properties
3. apply Cayley- Hamilton theorem to problems for finding the inverse of a matrix and higher powers of matrices without using routine methods
4. learn the properties of inner product spaces and determine orthogonality in inner product spaces.

Course Syllabus:

UNIT – I (12 Hours)

Vector Spaces-I:

Vector Spaces, General properties of vector spaces, n-dimensional Vectors, addition and scalar multiplication of Vectors, internal and external composition, Null space, Vector subspaces, Algebra of subspaces, Linear Sum of two subspaces, linear combination of Vectors, Linear span Linear independence and Linear dependence of Vectors.

UNIT –II (12 Hours)

Vector Spaces-II:

Basis of Vector space, Finite dimensional Vector spaces, basis extension, co-ordinates, Dimension of a Vector space, Dimension of a subspace, Quotient space and Dimension of Quotient space.

UNIT –III (12 Hours)

Linear Transformations:

Linear transformations, linear operators, Properties of L.T, sum and product of LTs, Algebra of Linear Operators, Range and null space of linear transformation, Rank and Nullity of linear transformations – Rank – Nullity Theorem.

UNIT –IV (12 Hours)

Matrix :

Matrices, Elementary Properties of Matrices, Inverse Matrices, Rank of Matrix, Linear Equations, Characteristic equations, Characteristic Values & Vectors of square matrix, Cayley – Hamilton Theorem.

UNIT –V (12 Hours)

Inner product space :

Inner product spaces, Euclidean and unitary spaces, Norm or length of a Vector, Schwartz inequality, Triangle Inequality, Parallelogram law, Orthogonality, Orthonormal set, complete orthonormal set, Gram – Schmidt orthogonalisation process. Bessel's inequality and Parseval's Identity.

Co-Curricular Activities(15 Hours)

Seminar/ Quiz/ Assignments/ Linear algebra and its applications / Problem Solving.

Text Book:

Linear Algebra by J.N. Sharma and A.R. Vasista, published by Krishna Prakashan Mandir, Meerut- 250002.

Reference Books :

1.Matrices by Shanti Narayana, published by S.Chand Publications.

2. Linear Algebra by Kenneth Hoffman and Ray Kunze, published by Pearson Education (low priced edition),New Delhi.

3. Linear Algebra by Stephen H. Friedberg et. al. published by Prentice Hall of India Pvt. Ltd. 4th Edition, 2007.

Recommended Question Paper Patterns and Models
BLUE PRINT FOR QUESTION PAPER PATTERN
COURSE-I, DIFFERENTIAL EQUATIONS

Unit	TOPIC	S.A.Q(including choice)	E.Q(including choice)	Total Marks
I	Differential Equations of 1st order and 1st degree	2	2	30
II	Orthogonal Trajectories, Differential Equations of 1st order but not of 1st degree	2	2	30
III	Higher Order Linear Differential Equations (with constant coefficients) – I	1	2	25
IV	Higher Order Linear Differential Equations (with constant coefficients) – II	2	2	30
V	Higher Order Linear Differential Equations (with non constant coefficients)	1	2	25
TOTAL		8	10	140

S.A.Q.   = Short answer questions   (5 marks)
E.Q.   = Essay questions   (10 marks)

Short answer questions   : 5 X 5 M   = 25 M
Essay questions   : 5 X 10 M = 50 M
…………….....
Total Marks   = 75 M

....

Time: 3Hrs   **Max.Marks:75M**

SECTION - A

Answer any <u>FIVE</u> questions. Each question carries <u>FIVE</u> marks5 X 5 M=25 M

1. Solve $\left(1 + e^{x/y}\right) dx + e^{x/y}\left(1 - \frac{x}{y}\right) dy = 0$.

2. Solve $\left(y - e^{\sin^{-1} x}\right)\frac{dx}{dy} + \sqrt{1 - x^2} = 0$

3. Solve $y + px = p^2 x^4$.

4. Solve $(px - y)(py + x) = 2p$

5. Solve $(D^2 - 3D + 2) = \cosh x$

6. Solve$(D^2 - 4D + 3)y = \sin 3x \cos 2x$.

7. Solve $\frac{d^2 y}{dx^2} - 6\frac{dy}{dx} + 13y = 8e^{3x}\sin 2x$.

8. Solve $x^2 y'' - 2x(1 + x)y' + 2(1 + x)y = x^3$

SECTION - B

Answer <u>ALL</u> the questions. Each question carries <u>TEN</u> marks. 5 X 10 M = 50 M

9 a) Solve $x\frac{dy}{dx} + y = y^2 \log x$.

(Or)

9 b) Solve $\left(y + \frac{1}{3}y^3 + \frac{1}{2}x^2\right) dx + \frac{1}{4}(x + xy^2) dy = 0$.

10 a) Solve$p^2 + 2py\cot x = y^2$.

(Or)

10 b) Find the orthogonal trajectories of the family of curves
$x^{2/3} + y^{2/3} = a^{2/3}$ where 'a' is the parameter.

11 a) Solve $(D^3 + D^2 - D - 1)y = \cos 2x$.

(Or)

11 b) Solve $(D^2 - 3D + 2)y = \sin e^{-x}$.

12 a) Solve $(D^2 - 2D + 4)y = 8(x^2 + e^{2x} + \sin 2x)$

(Or)

12 b) $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = xe^x \sin x$

13 a) Solve $(D^2 - 2D)y = e^x \sin x$ by the method of variation of parameters.

(Or)

13 b) Solve $3x^2 \frac{d^2y}{dx^2} + x\frac{dy}{dx} + y = x$

BLUE PRINT FOR QUESTION PAPER PATTERN
COURSE-II, THREE DIMENSIONAL ANALYTICAL SOLID GEOMETRY

Unit	TOPIC	S.A.Q(including choice)	E.Q(including choice)	Total Marks
I	The Plane	2	2	30
II	The Right Line	2	2	30
III	The Sphere	2	2	30
IV	The Sphere & The Cone	1	2	25
V	The Cone	1	2	25
	TOTAL	8	10	140

S.A.Q. = Short answer questions (5 marks)

E.Q. = Essay questions (10 marks)

Short answer questions : 5 X 5 M = 25 M

Essay questions : 5 X 10 M = 50 M

………………......

Total Marks = 75 M

....

Time: 3Hrs   Max.Marks:75 M

SECTION - A

Answer any FIVE questions. Each question carries FIVE marks 5 X 5 M=25 M

1. Find the equation of the plane through the point (-1,3,2) and perpendicular to the planes x+2y+2z=5 and 3x+3y+2z=8.

2. Find the bisecting plane of the acute angle between the planes 3x-2y-6z+2=0,   -2x+y-2z-2=0.

3. Find the image of the point (2,-1,3) in the plane 3x-2y+z =9.

4. Show that the lines $2x + y - 4 = 0 = y + 2z$ and $x + 3z - 4 = 0$, $2x + 5z - 8 = 0$ are coplanar.

5. A variable plane passes through a fixed point (a, b, c). It meets the axes in A,B,C. Show that the centre of the sphere OABC lies on $ax^{-1}+by^{-1}+cz^{-1}=2$.

6. Show that the plane 2x-2y+z+12=0 touches the sphere $x^2+y^2+z^2-2x-4y+2z-3=0$ and find the point of contact.

7. Find the equation to the cone which passes through the three coordinate axes and the lines $\frac{x}{1} = \frac{y}{-2} = \frac{z}{3}$ and $\frac{x}{2} = \frac{y}{1} = \frac{z}{1}$

8. Find the equation of the enveloping cone of the sphere $x^2 + y^2 + z^2 + 2x - 2y = 2$ with its vertex at (1, 1, 1).

SECTION - B

Answer ALL the questions. Each question carries TEN marks. 5 X 10 M = 50 M

9(a) A plane meets the coordinate axes in A, B, C. If the centroid of ΔABC is

(a,b,c), show that the equation of the plane is $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 3$.

(OR)

(b) A variable plane is at a constant distance p from the origin and meets the axes

in A,B,C. Show that the locus of the centroid of the tetrahedron OABC is $x^{-2}+y^{-2}+z^{-2}=16p^{-2}$.

10(a) Find the shortest distance between the lines

$$\frac{x-3}{3} = \frac{y-8}{-1} = \frac{z-3}{1} ; \frac{x+3}{-3} = \frac{y+7}{2} = \frac{z-6}{4}.$$

(OR)

(b) Prove that the lines $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4} ; \frac{x-2}{3} = \frac{y-3}{4} = \frac{z-4}{5}$ are coplanar. Also

find their point of intersection and the plane containing the lines.

11 (a) Show that the two circles $x^2+y^2+z^2-y+2z=0$, x-y+z=2;

$x^2+y^2+z^2+x-3y+z-5=0$, 2x-y+4z-1=0 lie on the same sphere and find its

equation.

(OR)

(b) Find the equation of the sphere which touches the plane 3x+2y-z+2=0

at (1,-2,1) and cuts orthogonally the sphere $x^2+y^2+z^2-4x+6y+4=0$.

12 (a) Find the limiting points of the coaxial system of spheres

$x^2+y^2+z^2-8x+2y-2z+32=0$, $x^2+y^2+z^2-7x+z+23=0$.

(OR)

(b) Find the equation to the cone with vertex is the origin and whose

base curve is $x^2+y^2+z^2+2ux+d=0$.

13 (a) Prove that the equation $\sqrt{fx} \pm \sqrt{gy} \pm \sqrt{hz} = 0$ represents a cone that

touches the coordinate planes and find its reciprocal cone.

(OR)

(b) Find the equation of the sphere $x^2+y^2+z^2-2x+4y-1=0$ having its

generators parallel to the line x=y=z.

BLUE PRINT FOR QUESTION PAPER PATTERN
COURSE-III, ABSTRACT ALGEBRA

Unit	TOPIC	S.A.Q(including choice)	E.Q(including choice)	Total Marks
I	Groups	2	2	30
II	Subgroups, Cosets & Lagrange's theorem	1	2	25
III	Normal Subgroups and Homomorphism	1	2	25
IV	Permutations and Cyclic groups	2	2	30
V	Rings	2	2	30
Total		8	10	140

S.A.Q. = Short answer questions (5 marks)

E.Q. = Essay questions (10 marks)

Short answer questions : 5 X 5 M = 25 M

Essay questions : 5 X 10 M = 50 M

…………….....

Total Marks = 75 M

....

Time: 3Hrs   Max.Marks:75M

SECTION - A

Answer any FIVE questions. Each question carries FIVE marks 5 X 5 M=25 M

1. Show that the set G=$\{x/x = 2^a3^b \ and \ a,b \in Z \}$ is a group under multiplication

2. Define order of an element. In a group G, prove that if $a \in G$ then $O(a) = O(a)^{-1}$.

3. If H and K are two subgroups of a group G, then prove that HK is a subgroup $\Leftrightarrow$ HK=KH

4.If G is a group and H is a subgroup of index 2 in G then prove that H is a normal subgroup.

5. Examine whether the following permutations are even or odd

i) $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 6 & 1 & 4 & 3 & 2 & 5 & 7 & 8 & 9 \end{pmatrix}$

ii) $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 3 & 2 & 4 & 5 & 6 & 7 & 1 \end{pmatrix}$

6. Prove thata group of prime order is cyclic.

7.Prove that the characteristic of an integral domain is either prime or zero.

8. If F is a field then prove that $\{0\}$ and F are the only ideals of F.

SECTION - B

Answer ALL the questions. Each question carries TEN marks. 5 X 10 M = 50 M

9 a) Show that the set of nth roots of unity forms an abelian group under multiplication.

(Or)

9 b) In a group G, for $a, b \in G$, O(a)=5, b $\neq$ e and $aba^{-1} = b^2$. Find O(b).

10 a) The Union of two subgroups is also a subgroup $\Leftrightarrow$ one is contained in the other.

(Or)

b) State and prove Langrage's theorem.

11 a) Prove that a subgroup H of a group G is a normal subgroup of G iff the product of two right cosets of H in G is again a right coset of H in G.

(Or)

11 b) State and prove fundamental theorem of homomorphisms of groups.

12 a) Let S_n be the symmetric group on n symbols and let A_n be the group of even permutations. Then show that A_n is normal in S_n and $O(A_n) = \frac{1}{2}(n!)$

(Or)

12 b)prove thatevery subgroup of cyclic group is cyclic.

13 a) Prove that every finite integral domain is a field.

(Or)

13 b) Define principal idea. Prove that every ideal of Z is a principal ideal.

BLUE PRINT FOR QUESTION PAPER PATTERN
COURSE-IV, REAL ANALYSIS

Unit	TOPIC	S.A.Q(including choice)	E.Q(including choice)	Total Marks
I	Real Number System and Real Sequence	2	2	30
II	Infinite Series	1	2	25
III	Limits and Continuity	1	2	25
IV	Differentiation and Mean Value Theorem	2	2	30
V	Riemann Integration	2	2	30
	TOTAL	8	10	140

S.A.Q. = Short answer questions (5 marks)

E.Q. = Essay questions (10 marks)

Short answer questions : 5 X 5 M = 25 M

Essay questions : 5 X 10 M = 50 M

………………......

Total Marks = 75 M

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Time: 3Hrs   Max.Marks:75M

SECTION - A

Answer any FIVE questions. Each question carries FIVE marks 5 X 5 M=25 M

1.Prove that every convergent sequence is bounded.

2. Show that $\lim\left(\dfrac{1}{(n+1)^2} + \dfrac{1}{(n+2)^2}+\text{-----------------}+\dfrac{1}{(n+n)^2}\right)=0$.

3. Test the convergence of the series $\sum_{n=1}^{\infty}\left(\sqrt[3]{n^3 + 1} - n\right)$.

4. Examine for continuity of the function f defined by $f(x) = |x| + |x - 1|$ at x=0 and 1.

5. Show that $f(x) = x \sin\dfrac{1}{x}, \ x \neq 0; f(x) = 0, x = 0$ is continuous but not derivable at

   x=0.

6.Verify Rolle's theorem for the function f(x) = x^3- $6x^2$+11x-6 on $[1,3]$.

7. If $f(x) = x^2 \ \forall \ x \in [0,1]$ and $p = \{0,\dfrac{1}{4},\dfrac{2}{4},\dfrac{3}{4}, 1\}$ then find L(p, f) and U(p, f).

8.prove that if $f: [a,b] \rightarrow R$ is continuous on [a, b] then f is R- integrable on [a, b].

SECTION –B

Answer ALL the questions. Each question carries TEN marks. 5 X 10 M = 50 M

9.(a)If $S_n = 1 + \dfrac{1}{2!} + \dfrac{1}{3!} + \text{- - - - - - -} + \dfrac{1}{n!}$ then show that $\{S_n\}$ converges.

(OR)

(b) State and prove Cauchy's general principle of convergence.

10.(a) State and Prove Cauchy's nth root test.

(OR)

(b) Test the convergence of $\sum \dfrac{x^n}{x^n+a^n}$ $(x > 0, a > 0)$.

11.(a) Let f: R$\rightarrow$ R be such that

$$f(x) = \dfrac{\sin(a+1)x+\sin x}{x} \quad \text{for } x < 0$$

$$= c \quad \text{for } x = 0$$

$$= \dfrac{(x+bx^2)^{1/2}-x^{1/2}}{bx^{3/2}} \quad \text{for } x > 0$$

Determine the values of a, b, c for which the function f is continuous at x=0.

(OR)

(b) Define uniform continuity, If a function f is continuous on [a b] then f is

uniformly continuous on [a b]

12.(a) Using Lagrange's theorem, show that $x > \log(1 + x) > \dfrac{x}{(1+x)} \forall x > 0$.

(OR)

(b) State and prove Cauchy's mean value theorem.

.

13.(a) State and prove Riemman's necessary and sufficient condition for R- integrability.

(OR)

(b) Prove that $\dfrac{\pi^3}{24} \leq \int_0^\pi \dfrac{x^2}{5+3\cos x} dx \leq \dfrac{\pi^3}{6}$.

BLUE PRINT FOR QUESTION PAPER PATTERN
COURSE-V, LINEAR ALGEBRA

Unit	TOPIC	S.A.Q (including choice)	E.Q (including choice)	Marks Allotted
I	Vector spaces - I	2	2	30
II	Vector spaces - II	1	2	25
III	Linear Transformation	2	2	30
IV	Char. values and char. vectors	1	2	25
V	Inner product spaces	2	2	30
Total		8	10	140

S.A.Q.   = Short answer questions   (5 marks)
E.Q.   = Essay questions   (10 marks)

Short answer questions   : 5 X 5 M   = 25 M
Essay questions   : 5 X 10 M   = 50 M
……………......
Total Marks   = 75 M
....

Time: 3Hrs   **Max.Marks:75M**

SECTION - A

Answer any <u>FIVE</u> questions. Each question carries <u>FIVE</u> marks 5 X 5 M=25 M

1. Let p, q, r be fixed elements of a field F. Show that the set W of all triads (x, y, z) of elements of F, such that px+qy+rz=0 is a vector subspace of $V_3(R)$.

2. Define linearly independent &linearly dependent vectors in a vector space. If α, β, γ are linearly independent vectors of $V(R)$ then show that $\alpha + \beta, \beta + \gamma, \gamma + \alpha$ are also linearly independent.

3. Prove that every set of $(n+1)$ or more vectors in an n dimensional vector space is linearly dependent.

4. The mapping T : $V_3(R) \rightarrow V_3(R)$ is defined by T(x,y,z) = (x-y,x-z). Show that T is a linear transformation.

5. Let $T: R^3 \rightarrow R^2$ and $H: R^3 \rightarrow R^2$ be defined by T (x, y, z)= (3x, y+z) and H (x, y, z)= (2x-z, y). Compute i) T+H ii) 4T-5H   iii) TH iv) HT.

6. If the matrix A is non-singular, show that the eigen values of A^{-1} are the reciprocals of the eigen values of A.

7. State and prove parallelogram law in an inner product space V(F).

8. Prove that the set S = $\left\{ \left(\frac{1}{3}, \frac{-2}{3}, \frac{-2}{3} \right), \left(\frac{2}{3}, \frac{-1}{3}, \frac{2}{3} \right), \left(\frac{2}{3}, \frac{2}{3}, \frac{-1}{3} \right) \right\}$ is an orthonormal set in the inner product space $R^3(R)$ with the standard inner product.

SECTION - B

Answer <u>ALL</u> the questions. Each question carries <u>TEN</u> marks. 5 X 10 M = 50 M

9(a)) Define vector space. Let V (F) be a vector space. Let W be a non empty sub set of V. Prove that the necessary and sufficient condition for W to be a subspace of V is $a, b \in F$ and $\alpha, \beta \epsilon V => a\alpha + b\beta \epsilon W$.

(OR)

(b) Prove that the four vectors (1,0,0), (0,1,0), (0,0,1) and (1,1,1) of $V_3(C)$ form linearly dependent set, but any three of them are linearly independent.

10(a)Define dimension of a finite dimensional vector space. If W is a subspace of a finite dimensional vector space V(F) then prove that W is finite dimensional and dim W$\leq n$.

(OR)

(b) If W be a subspace of a finite dimensional vector space V(F) then Prove that

$\dim {}^V/_W = \dim V - \dim W$.

11(a) Find T (x, y, z) where $T: R^3 \to R$ is defined by T (1, 1, 1) =3, T (0, 1, -2) =1, T (0, 0, 1) = -2

(OR)

(b) State and prove Rank Nullity theorem.

12(a) Find the eigen values and the corresponding eigen vectors of the matrix

$$A = \begin{pmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{pmatrix}.$$

(OR)

(b) State and prove Cayley-Hamilton theorem.

13(a) State and prove Schwarz's inequality in an Inner product space V(F).

(OR)

(b) Given $\{(2,1,3), (1,2,3), (1,1,1)\}$ is a basis of R^3(R).Construct an orthonormal basis using Gram-Schmidt orthogonalisation process.

<u>SUBJECT EXPERTS</u>

Prof. GVR Babu
Dept of Mathematics,
Andhra University,
Visakhapatnam

Dr.K.Chitti Babu,
Lecturer in Mathematics,
Govt. Degree College,
Ramachandrapuram

<u>SYLLABUS VETTED BY</u>

Prof.D.Bharathi,
Dept of Mathematics,
S V University,
Tirupati

ANDHRA UNIVERSITY
B.A/B.Sc., STATISTICS (WM) CBCS REVISED SYLLABUS 2020-21

Year	Semester	Paper	Subject	IA	EA	Total
1	I	I	Descriptive Statistics	25	75	100
	II	II	Probability Theory and Distributions	25	75	100
2	III	III	Statistical Inference	25	75	100
	IV	IV	Sampling Techniques and Design of Experiments	25	75	100
		V	Applied Statistics	25	75	100

OBJECTIVE OF THE COURSE

Statistics is a key to success in the field of science and technology. Today, the students need a thorough knowledge of fundamental basic principles, methods, results and a clear perception of the power of statistical ideas and tools to use them effectively in modeling, interpreting and solving the real life problems. Statistics plays an important role in the context of globalization of Indian economy, modern technology, computer science and information technology.

The main objectives of the course are

- To build the basis for promoting theoretical and application aspects of statistics.

- To underline the statistics as a science of decision making in the real life problems with the description of uncertainty.

- To emphasize the relevance of statistical tools and techniques of analysis in the study of inter-disciplinary sciences.

- To acquaint students with various statistical methods and their applications in different fields.

- To cultivate statistical thinking among students.

- To develop skills in handling complex problems in data analysis and research design.

- To prepare students for future courses having quantitative components.

This course is aimed at preparing the students to hope with the latest developments and compete with students from other universities and put them on the right track.

Paper Wise Objectives

PAPER-I: Descriptive Statistics
- The objective of this paper is to throw light on the role of statistics in different fields with special reference to business and economics.
- It gives the students to review good practice in presentation and the format most applicable to their own data.
- The measures of central tendency or averages reduce the data to a single value which is highly useful for making comparative studies.
- The measures of dispersion throw light on reliability of average and control of variability
- The concept of Correlation and Linear Regression deals with studying the linear relationship between two or more variables, which is needed to analyze the real life problems.
- The attributes gives an idea that how to deal with qualitative data.

PAPER-II: Probability Theory and Distributions
- This paper deals with the situation where there is uncertainty and how to measure that uncertainty by defining the probability, random variable and mathematical expectation which are essential in all research areas.
- This paper gives an idea of using various standard theoretical distributions, their chief characteristics and applications in analyzing any data.

PAPER-III:Statistical Inference
- This paper deals with standard sampling distributions like Chi Square, t and F and their characteristics and applications.
- This paper deals with the different techniques of point estimation for estimating the parameter values of population and interval estimation for population parameters.
- In this paper, various topics of Inferential Statistics such as interval estimation,Testing of Hypothesis, large sample tests (Z-test), small sample tests (t-test, F-test, chi-square test) and non-parametric tests are dealt with. These techniques play an important role in many fields like pharmaceutical, agricultural, medical etc.

PAPER-IV: Sampling Techniques and Design of Experiments

- The sampling techniques deals with the ways and methods that should be used to draw samples to obtain the optimum results, i.e., the maximum information about the characteristics of the population with the available sources at our disposal in terms of time, money and manpower to obtain the best possible estimates of the population parameters
- This paper throw light on understanding the variability between group and within group through Analysis of Variance
- This gives an idea of logical construction of Experimental Design and applications of these designs now days in various research areas.
- Factorial designs allow researchers to look at how multiple factors affect a dependent variable, both independently and together.

PAPER-V: Applied Statistics

- This paper deals the time series on simple description methods of data, explains the variation, forecasting the future values, control procedures.
- It gives an idea of using index numbers in a range of practical situations, limitations and uses
- The vital statistics enlighten the students in obtaining different mortality, fertility rates thus obtaining the population growth rates and construction and use of life tables in actuarial science.

ANDHRA UNIVERSITY
B.A/B.Sc., STATISTICS (WM) CBCS REVISED SYLLABUS 2020-21
Semester – I (CBCS With Maths Combination Common to BA/BSc)
Paper - I: Descriptive Statistics

UNIT-I

Introduction to Statistics: Importance of Statistics. Scope of Statistics in different fields. Concepts of primary and secondary data. Diagrammatic and graphical representation of data: Histogram, frequency polygon, Ogives, Pie. Measures of Central Tendency: Mean, Median, Mode, Geometric Mean and Harmonic Mean. Median and Mode through graph.

UNIT-II

Measures of Dispersion: Range, Quartile Deviation, Mean Deviation and Standard Deviation, Variance. Central and Non-Central moments and their interrelationship. Sheppard's correction for moments. Skewness and kurtosis.

UNIT-III

Curve fitting: Bi- variate data, Principle of least squares, fitting of degree polynomial. Fitting of straight line, Fitting of Second degree polynomial or parabola, Fitting of power curve and exponential curves.

Correlation: Meaning, Types of Correlation, Measures of Correlation: Scatter diagram, Karl Pearson's Coefficient of Correlation, Rank Correlation Coefficient (with and without ties), Bi-variate frequency distribution, correlation coefficient for bi-variate data and simple problems. Concept of multiple and partial correlation coefficients (three variables only) and properties

UNIT-IV

Regression : Concept of Regression, Linear Regression: Regression lines, Regression coefficients and it's properties, Regressions lines for bi-variate data and simple problems. Correlation vs regression.

UNIT-V

Attributes : Notations, Class, Order of class frequencies, Ultimate class frequencies, Consistency of data, Conditions for consistency of data for 2 and 3 attributes only , Independence of attributes , Association of attributes and its measures, Relationship between association and colligation of attributes, Contingencytable: Square contingency**,** Mean square contingency, Coefficient of mean square contingency, Tschuprow's coefficient of contingency.

Text Books:

1. V.K.Kapoor and S.C.Gupta: Fundamentals of MathematicalStatistics,Sultan Chand & Sons, NewDelhi.

2 BA/BSc I year statistics - descriptive statistics, probability distribution - Telugu Academy - Dr M.JaganmohanRao,DrN.Srinivasa Rao, Dr P.Tirupathi Rao, Smt.D.Vijayalakshmi.

3. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI

Reference books:

1. Willam Feller: Introduction to Probability theory and its applications. Volume –I,Wiley
2. Goon AM, Gupta MK, Das Gupta B : Fundamentals of Statistics , Vol-I, the World Press Pvt.Ltd.,Kolakota.
3. Hoel P.G: Introduction to mathematical statistics, Asia Publishinghouse.
4. M. JaganMohan Rao and Papa Rao: A Text book of StatisticsPaper-I.
5. Sanjay Arora and Bansi Lal: New Mathematical Statistics: Satya Prakashan , NewDelhi

Credits 2

Practicals - Paper – I

1. Graphical presentation of data (Histogram, frequency polygon,Ogives).
2. Diagrammatic presentation of data (Bar andPie).
3. Computation of measures of central tendency(Mean, Median andMode)
4. Computation of measures of dispersion(Q.D, M.D andS.D)
5. Computation of non-central, central moments, $\beta1$ and $\beta2$ for ungroupeddata.
6. Computation of non-central, central moments, $\beta1$ and $\beta2$ and Sheppard's corrections for groupeddata.
7. Computation of Karl Pearson's coefficients of Skewness and Bowley's coefficients ofSkewness.
8. Fitting of straight line by the method of leastsquares
9. Fitting of parabola by the method of leastsquares
10. Fitting of power curve of the type by the method of leastsquares.
11. Fitting of exponential curve of the type and by the method of leastsquares.
12. Computation of correlation coefficient and regression lines for ungroupeddata
13. Computation of correlation coefficient, forming regression lines for groupeddata
14. Computation of Yule's coefficient ofassociation
15. Computation of Pearson's, Tcherprows coefficient ofcontingency

Note: Training shall be on establishing formulae in Excel cells and derive the results. The excel output shall be exported to MS word for writing inference.

Course Learning Outcomes

Students will acquire

1) knowledge of Statistics and its scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc.
2) knowledge of various types of data, their organization and evaluation of summary measures such as measures of central tendency and dispersion etc.
3) knowledge of other types of data reflecting quality characteristics including concepts of independence and association between two attributes,
4) insights into preliminary exploration of different types of data.
5) Knowledge of correlation, regression analysis, regression diagnostics, partial and multiple correlations.

ANDHRA UNIVERSITY
B.A/B.Sc., STATISTICS (WM) CBCS REVISED SYLLABUS 2020-21
Semester – II (CBCS With Maths Combination Common to BA/BSc)
Paper - II: <u>**Probability Theory and Distributions**</u>

UNIT-I

Introduction to Probability: Basic Concepts of Probability, random experiments, trial, outcome, sample space, event, mutually exclusive and exhaustive events, equally likely and favourable outcomes. Mathematical, Statistical, axiomatic definitions of probability. Conditional Probability and independence of events, Addition and multiplication theorems of probability for 2 and for n events. Boole's inequality and Baye's theorem and its applications in real life problems.

UNIT-II

Random variable: Definition of random variable, discrete and continuous random variables, functions of random variable. Probability mass function. Probability density function, Distribution function and its properties. For given pmf, pdf calculation of moments, coefficient of skewness and kurtosis. Bivariate random variable - meaning, joint, marginal and conditional Distributions, independence of random variables and simple problems.

UNIT- III

Mathematical expectation : Mathematical expectation of a random variable and function of a random variable. Moments and covariance using mathematical expectation with examples. Addition and Multiplication theorems on expectation. Definitions of M.G.F, C.G.F, P.G.F, C.F and their properties. Chebyshev and Cauchy - Schwartz inequalities.

UNIT-IV

Discrete Distributions: Binomial, Poisson, Negative Binomial, Geometric distributions: Definitions, means, variances, M.G.F, C.F, C.G.F, P.G.F, additive property if exists. Possion approximation to Binomial distribution. Hyper-geometric distribution: Defination, mean and variance.

UNIT - V

Continuous Distributions: Rectangular, Exponential, Gamma, Beta Distributions: mean , variance, M.G.F, C.G.F, C.F. **Normal Distribution**: Definition, Importance, Properties, M.G.F, CF, additive property.

Text Books:
1. V.K.Kapoor and S.C.Gupta: Fundamentals of MathematicalStatistics,Sultan   Chand & Sons, NewDelhi.
2 BA/BSc I year statistics - descriptive statistics, probability distribution - Telugu Academy - Dr M.JaganmohanRao,DrN.Srinivasa Rao, Dr P.Tirupathi Rao, Smt.D.Vijayalakshmi.
3. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC. PHI

Reference books:
1. Willam Feller: Introduction to Probability theory and its applications. Volume –I,Wiley
2. Goon AM, Gupta MK, Das Gupta B : Fundamentals of Statistics , Vol-I, the World Press Pvt.Ltd.,Kolakota.

3. Hoel P.G: Introduction to mathematical statistics, Asia Publishinghouse.
4. M. JaganMohan Rao and Papa Rao: A Text book of StatisticsPaper-I.
5. Sanjay Arora and Bansi Lal: New Mathematical Statistics: Satya Prakashan , NewDelhi
6. Hogg Tanis Rao: Probability and Statistical Inference. 7thedition.Pearson.

Credits 2

Practicals Paper – II

1. Fitting of Binomial distribution – Directmethod.
2. Fitting of binomial distribution – Recurrence relationMethod.
3. Fitting of Poisson distribution – Directmethod.
4. Fitting of Poisson distribution - Recurrence relationMethod.
5. Fitting of Negative Binomialdistribution.
6. Fitting of Geometricdistribution.
7. Fitting of Normal distribution – Areasmethod.
8. Fitting of Normal distribution – Ordinatesmethod.
9. Fitting of Exponentialdistribution.

Note: Training shall be on establishing formulae in Excel cells and derive the results. The excel output shall be exported to MS word for writing inference.

Course Learning Outcomes
Students will acquire
1) ability to distinguish between random and non-random experiments,
2) knowledge to conceptualize the probabilities of events including frequentist and axiomatic approach. Simultaneously, they will learn the notion of conditional probability including the concept of Bayes' Theorem,
3) knowledge related to concept of discrete and continuous random variables and their probability distributions including expectation and moments,
4) knowledge of important discrete and continuous distributions such as Binomial, Poisson, Geometric, Negative Binomial and Hyper-geometric, normal, uniform, exponential, beta and gamma distributions,
(e) acumen to apply standard discrete and continuous probability distributions to different situations.

ANDHRA UNIVERSITY
B.A/B.Sc., STATISTICS (WM) CBCS REVISED SYLLABUS 2020-21
Semester – III (CBCS With Maths Combination Common to BA/BSc)
Paper - III: Statistical Inference

UNIT-I

Concepts: Population, Sample, Parameter, statistic, Sampling distribution, Standard error. convergence in probability and convergence in distribution, law of large numbers, central limit theorem (statements only). Student's t- distribution, F – Distribution, χ^2-Distribution: Definitions, properties and their applications.

UNIT-II

Theory of estimation: Estimation of a parameter, criteria of a good estimator – unbiasedness, consistency, efficiency, &sufficiency and. Statement of Neyman's factorization theorem. Estimation of parameters by the method of moments and maximum likelihood (M.L), properties of MLE's. Binomial, Poisson &Normal Population parameters estimate by MLE method. Confidence Intervals.

UNIT-III

Testing of Hypothesis: Concepts of statistical hypotheses, null and alternative hypothesis, critical region, two types of errors, level of significance and power of a test. One and two tailed tests. Neyman-Pearson's lemma. Examples in case of Binomial, Poisson, Exponential and Normal distributions.

UNIT – IV

Large sample Tests:large sample test for single mean and difference of two means, confidence intervals for mean(s). Large sample test for single proportion, difference of proportions. standard deviation(s) and correlation coefficient(s)**.**

SmallSampletests:t-testforsinglemean,differenceofmeansandpairedt-test.$\chi2$-testforgoodness of fit and independence of attributes. F-test for equality ofvariances.

UNIT – V

Non-parametric tests- their advantages and disadvantages, comparison with parametric tests. Measurement scale- nominal, ordinal, interval and ratio. One sample runs test, sign test and Wilcoxon-signed rank tests (single and paired samples). Two independent sample tests: Median test, Wilcoxon – Mann-Whitney U test, Wald Wolfowitz's runs test**.**

TEXT BOOKS
1. BA/BSc II year statistics - statistical methods and inference - Telugu Academy by A.Mohanrao, N.Srinivasa Rao, Dr R.Sudhakar Reddy, Dr T.C. RavichandraKumar.
2. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC.PHI.

REFERENCE BOOKS:
1. Fundamentals of Mathematics statistics : VK Kapoor and SCGuptha.
2. Outlines of statistics, Vol II : Goon Guptha, M.K.Guptha, Das GupthaB.
3. Introduction to Mathematical Statistics :HoelP.G.
4. Hogg Tanis Rao: Probability and Statistical Inference. 7[th]edition.Pearson.

Credits: 2

Practicals - Paper –III

1. Large sample test for singlemean
2. Large sample test for difference ofmeans
3. Large sample test for singleproportion
4. Large sample test for difference ofproportions
5. Large sample test for difference of standarddeviations
6. Large sample test for correlationcoefficient
7. Small sample test for singlemean
8. Small sample test for difference ofmeans
9. Small sample test for correlationcoefficient
10. Paired t-test(pairedsamples).
11. Small sample test for single variance($\chi 2$ - test)
12. Small sample test for difference ofvariances(F-test)
13. $\chi 2$ - test for goodness of fit and independence ofattributes
14. Nonparametric tests for single sample(run test, sign test and Wilcoxon signed ranktest)
15. Nonparametric tests for related samples (sign test and Wilcoxon signed ranktest)
16. Nonparametric tests for two independent samples (Median test, Wilcoxon –Mann- Whitney - U test, Wald - Wolfowitz' s runstest)

Note: Training shall be on establishing formulae in Excel cells and deriving the results. The excel output shall be exported to MS Word for writinginferences.

Course Learning Outcomes
The students will acquire
1) Concept of law large numbers and their uses
2) Concept of central limit theorem and its uses in statistics
3) concept of random sample from a distribution, sampling distribution of a statistic, standard error of important estimates such as mean and proportions,
4) knowledge about important inferential aspects such as point estimation, test of hypotheses and associated concepts,
5) knowledge about inferences from Binomial, Poisson and Normal distributions as illustrations,
6) concept about non-parametric method and some important non-parametric tests.

ANDHRA UNIVERSITY
B.A/B.Sc., STATISTICS (WM) CBCS REVISED SYLLABUS 2020-21
Semester – IV (CBCS With Maths Combination Common to BA/BSc)
<u>Paper IV: Sampling Techniques and Designs of Experiments</u>

UNIT I

Simple Random Sampling (with and without replacement): Notations and terminology, various probabilities of selection. Random numbers tables and its uses. Methods of selecting simple random sample, lottery method, method based on random numbers. Estimates of population total, mean and their variances and standard errors, determination of sample size, simple random sampling of attributes.

UNIT II

Stratified random sampling: Stratified random sampling, Advantages and Disadvantages of Stratified Random sampling, Estimation of population mean, and its variance. Stratified random sampling with proportional and optimum allocations. Comparison between proportional and optimum allocations with SRSWOR.

Systematic sampling: Systematic sampling definition when N = nk and merits and demerits of systematic sampling - estimate of mean and its variance. Comparison of systematic sampling with Stratified and SRSWOR.

UNIT III

Analysis of variance : Analysis of variance(ANOVA) –Definition and assumptions. One-way with equal and unequal classification, Two way classification.

Design of Experiments: Definition, Principles of design of experiments, CRD: Layout, advantages and disadvantage and Statistical analysis of Completely Randomized Design(C.R.D).

UNIT IV

Randomized Block Design (R.B.D) and Latin Square Design (L.S.D) with their layouts and Analysis, MissingplottechniqueinRBDandLSD.EfficiencyRBDoverCRD,EfficiencyofLSDoverRBDand CRD.

UNIT V

Factorial experiments – Main effects and interaction effects of 2^2 and 2^3 factorial experiments and their Statistical analysis. Yates procedure to find factorial effecttotals.

Text Books:

1. Telugu AcademyBA/BSc III year paper - III Statistics - applied statistics - Telugu

   academy by Prof.K.Srinivasa Rao, Dr D.Giri. Dr A.Anand, Dr V.PapaiahSastry.

2. K.V.S. Sarma: Statistics Made Simple: Do it yourself on PC.PHI.

Reference Books:
1. Fundamentals of applied statistics : VK Kapoor and SCGupta.
2. Indian Official statistics - MR Saluja.
3. Anuvarthita SankyakaSastram - TeluguAcademy.

Credits: 2

Practicals - Paper –IV

Sampling Techniques:

Estimation of population mean and its variance by
1. Simple random sampling with and without replacement. Comparison between SRSWRand SRSWOR.
2. Stratified random sampling with proportional and optimum allocations. Comparison between proportional and optimum allocations withSRSWOR.
3. Systematic sampling with N=nk. Comparison of systematic sampling with Stratified andSRSWOR.

Design of Experiments:
4. ANOVA - one - way classification with equal and unequal number ofobservations
5. ANOVA Two-way classification with equal number ofobservations.
6. Analysis ofCRD.
7. Analysis of RBD Comparison of relative efficiency of CRD withRBD
8. Estimation of single missing observation in RBD and itsanalysis
9. Analysis of LSD and efficiency of LSD over CRD andRBD
10. Estimation of single missing observation in LSD and itsanalysis
11. Analysis of 2^2 with RBD layout
12. Analysis of 2^3 with RBDlayout

Note: Training shall be on establishing formulae in Excel cells and deriving the results. The excel output shall be exported to MS Word for writinginferences.

Course Learning Outcomes

The students shall get
1) Introduced to various statistical sampling schemes such as simple, stratified and systematic sampling.
2) an idea of conducting the sample surveys and selecting appropriate sampling techniques,
3) Knowledge about comparing various sampling techniques.
4) carry out one way and two way Analysis of Variance,
5) understand the basic terms used in design of experiments,
6) use appropriate experimental designs to analyze the experimental data.

<u>Paper V: Applied Statistics</u>

UNIT I

Time Series: Time Series and its components with illustrations, additive, multiplicativemodels. Trend: Estimation of trend by free hand curve method, method of semi averages.Determination of trend by least squares (Linear trend, parabolic trend only), moving averages method.

UNIT II

Seasonal Component: Determination of seasonal indices by simple averages method, ratio to moving average, Ratio to trend and Link relative methods, Deseasonalization.

UNIT III

Growth curves: Modified exponential curve, Logistic curve and Grompertz curve, fitting of growth curves by the method of three selected points and partial sums.Detrending. Effect of elimination of trend on other components of the time series

UNIT IV

Index numbers: Concept, construction, problems involved in the construction of index numbers, uses and limitations. Simple and weighted index numbers. Laspayer's, Paasche's and Fisher's index numbers, Criterion of a good index number, Fisher's ideal index numbers. Cost of living index number and wholesale price index number.

UNIT V

Vital Statistics: Introduction, definition and uses of vital statistics, sources of vital statistics.

Measures of different Mortality and Fertility rates, Measurement of population growth. Life tables: construction and uses of life tables.

Text Books:
1. Fundamentals of applied statistics : VK Kapoor and SCGupta.
2. BA/BSc III year paper - III Statistics - applied statistics - Telugu academy by prof.K.Srinivasa Rao, Dr D.Giri. Dr A.Anand, Dr V.PapaiahSastry.

Reference Books:
3. AnuvarthitaSankyakaSastram - TeluguAcademy.
4. Mukopadhyay, P (2011). Applied Statistics, 2nd ed. Revised reprint, Books and Allied Pvt. Ltd.
5. Brockwell, P.J. and Devis, R.A. (2003). Introduction to Time Series Analysis. Springer.
6. Chatfield, C. (2001). Time Series Forecasting., Chapman & Hall.
7. Srinivasan, K. (1998). Demographic Techniques and Applications. Sage Publications
8. Srivastava O.S. (1983). A Text Book of Demography. Vikas Publishing House

Practical Paper –V

Time Series:
1. Measurement of trend by method of moving averages(odd and evenperiod)
2. Measurement of trend by method of Least squares(linear andparabola)
3. Determination of seasonal indices by method simpleaverages
4. Determination of seasonal indices by method of Ratio to movingaverages
5. Determination of seasonal indices by method of Ratio totrend
6. Determination of seasonal indices by method of Linkrelatives

Index Numbers:
7. Computation of simple indexnumbers.
8. Computation of all weighted index numbers.
9. Computation of reversaltests.

Vital Statistics:
10. Computation of various Mortalityrates
11. Computation of various Fertilityrates
12. Computation of various Reproductionrates.
13. Construction of LifeTables

Note: Training shall be on establishing formulae in Excel cells and deriving the results. The excel output shall be exported to MS Word for writinginferences.

Course Learning Outcomes
After completion of this course, the students will know about
1) time series data, its applications to various fields and components of time series,
2) fitting and plotting of various growth curves such as modified exponential, Gompertz and logistic curve,
3) fitting of trend by Moving Average method,
4) measurement of Seasonal Indices by Ratio-to-Trend , Ratio-to-Moving Average and Link Relative methods,
5) Applications to real data by means of laboratory assignments.
6) Interpret and use a range of index numbers commonly used in the business sector
7) Perform calculations involving simple and weighted index numbers
8) Understand the basic structure of the consumer price index and perform calculations involving its use
9) Various data collection methods enabling to have a better insight in policy making, planning and systematic implementation,
10) Construction and implementation of life tables,
11) Population growth curves, population estimates and projections,
12) Real data implementation of various demographic concepts as outlined above through practical assignments.

ANDHRA PRADESH STATE COUNCIL OF HIGHER EDUCATION

(A Statutory body of the Government of Andhra Pradesh)

3rd,4th and 5th floors, Neeladri Towers,Sri Ram Nagar,6th Battalion Road,
Atmakur(V),Mangalagiri(M), Guntur-522 503, Andhra Pradesh
Web:www.apsche.org **Email**: acapsche@gmail.com

REVISED SYLLABUS OF B.Sc. (COMPUTER SCIENCE/ INFORMATION TECHNOLOGY) UNDER CBCS FRAMEWORK WITH EFFECT FROM 2020-2021

PROGRAMME: THREE-YEAR B.Sc.

(B.Sc. Computer Science/ Information Technology (IT))

(With Learning Outcomes, Unit-wise Syllabus, References, Co-curricular Activities &

Model Q.P.)

For Fifteen Courses of 1, 2, 3 & 4 Semesters)

(To be Implemented from 2020-21 Academic Year)

Structure of Computer Science /Information Technology (IT)

Programme: B.Sc. with Computer Science as one of the Core Subjects.
Discipline: Computer Science

Year	Semester	Paper Code	Subject	Hrs. per Week	Credits	IA	ES	Total
First Year	I	C1	Problem Solving in C	4	3	25	75	100
	I	C1-P	Problem Solving in C Lab	2	2		50	50
	II	C2	Data Structures using C	4	3	25	75	100
	II	C2-P	Data Structures using C Lab	2	2		50	50
Second Year	III	C3	Database Management System	4	3	25	75	100
	III	C3-P	Database Management System Lab	2	2		50	50
	IV	C4	Object Oriented Programming using Java	4	3	25	75	100
	IV	C4-P	Object Oriented Programming using Java Lab	2	2		50	50
	IV	C5	Operating Systems	4	3	25	75	100
	IV	C5-P	Operating Systems Lab using C/Java	2	2		50	50

PROBLEM SOLVING IN C

Semester	Course Code	Course Title	Hours	Credits
I	C1	**PROBLEM SOLVING IN C**	60	3

Objectives:

This course aims to provide exposure to problem-solving through programming. It introduces the concepts of the C Programming language.

Course Learning Outcomes:

Upon successful completion of the course, a student will be able to:

1. Understand the evolution and functionality of a Digital Computer.
2. Apply logical skills to analyse a given problem
3. Develop an algorithm for solving a given problem.
4. Understand 'C' language constructs like Iterative statements, Array processing, Pointers, etc.
5. Apply 'C' language constructs to the algorithms towrite a 'C' language program.

UNIT I

General Fundamentals: Introduction to computers: Block diagram of a computer, characteristics and limitations of computers, applications of computers, types of computers, computer generations.

Introduction to Algorithms and Programming Languages: Algorithm – Key features of Algorithms, Flow Charts, Programming Languages – Generations of Programming Languages – Structured Programming Language- Design and Implementation of Correct, Efficient and Maintainable Programs.

UNIT II

Introduction to C: Introduction – Structure of C Program – Writing the first C Program – File used in C Program – Compiling and Executing C Programs – Using Comments –

Keywords – Identifiers – Basic Data Types in C – Variables – Constants – I/O Statements in C- Operators in C- Programming Examples.

Decision Control and Looping Statements: Introduction to Decision Control Statements– Conditional Branching Statements – Iterative Statements – Nested Loops – Break and Continue Statement – Goto Statement

UNIT III

Arrays: Introduction – Declaration of Arrays – Accessing elements of the Array – Storing Values in Array– Operations on Arrays – one dimensional, two dimensional and multi dimensional arrays, character handling and strings.

UNIT IV

Functions: Introduction – using functions – Function declaration/ prototype – Function definition – function call – return statement – Passing parameters – Scope of variables – Storage Classes – Recursive functions.

Structure, Union, and Enumerated Data Types: Introduction – Nested Structures – Arrays of Structures – Structures and Functions– Union – Arrays of Unions Variables – Unions inside Structures – Enumerated Data Types.

UNIT V

Pointers: Understanding Computer Memory – Introduction to Pointers – declaring Pointer Variables – Pointer Expressions and Pointer Arithmetic – Null Pointers - Passing Arguments to Functions using Pointer – Pointer and Arrays – Memory Allocation in C Programs – Memory Usage – Dynamic Memory Allocation – Drawbacks of Pointers

Files: Introduction to Files – Using Files in C – Reading Data from Files – Writing Data to Files – Detecting the End-of-file – Error Handling during File Operations – Accepting Command Line Arguments.

BOOKS

1. E Balagurusamy – Programming in ANSIC – Tata McGraw-Hill publications.
2. Brain W Kernighan and Dennis M Ritchie - The 'C' Programming language" - Pearson publications.
3. Ashok N Kamthane: Programming with ANSI and Turbo C, Pearson Edition Publications.
4. YashavantKanetkar - Let Us 'C' – BPB Publications.

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A.   Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity

B.   General

1. Group Discussion
2. Try to solve MCQ's available online.
3. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Problem-solving exercises,
4. Practical assignments and laboratory reports,

5. Observation of practical skills,

6. Individual and group project reports like "Creating Text Editor in C".

7. Efficient delivery using seminar presentations,

8. Viva voce interviews.

9. Computerized adaptive testing, literature surveys and evaluations,

10. Peers and self-assessment, outputs form individual and collaborative work

Semester	Course Code	Course Title	Hours	Credits
I	C1-P	**PROBLEM SOLVING IN C LAB**	30	2

Problem solving in C LAB

1. Write a program to check whether the given number is Armstrong or not.
2. Write a program to find the sum of individual digits of a positive integer.
3. Write a program to generate the first n terms of the Fibonacci sequence.
4. Write a program to find both the largest and smallest number in a list of integer values
5. Write a program to demonstrate refection of parameters in swapping of two integer values using **Call by Value**&**Call by Address**
6. Write a program that uses functions to add two matrices.
7. Write a program to calculate factorial of given integer value using recursive functions
8. Write a program for multiplication of twoN X N matrices.
9. Write a program to perform various string operations.
10. Write a program to search an element in a given list of values.
11. Write a program to sort a given list of integers in ascending order.
12. Write a program to calculate the salaries of all employees using *Employee (ID, Name, Designation, Basic Pay, DA, HRA, Gross Salary, Deduction, Net Salary)* structure.
    a. DA is 30 % of Basic Pay
    b. HRA is 15% of Basic Pay
    c. Deduction is 10% of (Basic Pay + DA)
    d. Gross Salary = Basic Pay + DA+ HRA
    e. Net Salary = Gross Salary - Deduction
13. Write a program to illustrate pointer arithmetic.

14. Write a program to read the data character by character from a file.

15. Write a program to create**Book (ISBN,Title, Author, Price, Pages, Publisher)**structureand store book details in a file and perform the following operations

    a. Add book details

    b. Search a book details for a given ISBN and display book details, if available

    c. Update a book details using ISBN

    d. Delete book details for a given ISBN and display list of remaining Books

DATA STRUCTURES USING C

Semester	Course Code	Course Title	Hours	Credits
II	**C2**	**DATA STRUCTURES USING C**	**60**	**3**

Course Objectives

To introduce the fundamental concept of data structures and to emphasize the importance of various data structures in developing and implementing efficient algorithms.

Course Learning Outcomes:

Upon successful completion of the course, a student will be able to:
1. Understand available Data Structures for data storage and processing.
2. ComprehendData Structure and their real-time applications - Stack, Queue, Linked List, Trees and Graph
3. Choose a suitable Data Structures for an application
4. Develop ability to implement different Sorting and Search methods
5. Have knowledge onData Structures basic operations like insert, delete, search,update and traversal
6. Design and develop programs using various data structures
7. Implement the applications of algorithms for sorting, pattern matching etc

UNIT – I:

Introduction to Data Structures: Introduction to the Theory of Data Structures, Data Representation, Abstract Data Types, Data Types, Primitive Data Types, Data Structure and Structured Type, Atomic Type, Difference between Abstract Data Types, Data Types, and Data Structures, Refinement Stages

Principles of Programming and Analysis of Algorithms: Software Engineering, Program Design, Algorithms, Different Approaches to Designing an Algorithm, Complexity, Big 'O' Notation, Algorithm Analysis, Structured Approach to Programming, Recursion, Tips and Techniques for Writing Programs in 'C'

UNIT – II:

Arrays: Introduction to Linear and Non- Linear Data Structures, One- Dimensional Arrays, Array Operations, Two- Dimensional arrays, Multidimensional Arrays, Pointers and Arrays, an Overview of Pointers

Linked Lists: Introduction to Lists and Linked Lists, Dynamic Memory Allocation, Basic Linked List Operations, Doubly Linked List, Circular Linked List, Atomic Linked List, Linked List in Arrays, Linked List versus Arrays

UNIT – III:

Stacks: Introduction to Stacks, Stack as an Abstract Data Type, Representation of Stacks through Arrays, Representation of Stacks through Linked Lists, Applications of Stacks, Stacks and Recursion

Queues: Introduction, Queue as an Abstract data Type, Representation of Queues, Circular Queues, Double Ended Queues- Deques, Priority Queues, Application of Queues

UNIT – IV:

Binary Trees: Introduction to Non- Linear Data Structures, Introduction Binary Trees, Types of Trees, Basic Definition of Binary Trees, Properties of Binary Trees, Representation of Binary Trees, Operations on a Binary Search Tree, Binary Tree Traversal, Counting Number of Binary Trees, Applications of Binary Tree

UNIT – V:

Searching and sorting: Sorting – An Introduction, Bubble Sort, Insertion Sort, Merge Sort, Searching – An Introduction, Linear or Sequential Search, Binary Search, Indexed Sequential Search

Graphs: Introduction to Graphs, Terms Associated with Graphs, Sequential Representation of Graphs, Linked Representation of Graphs, Traversal of Graphs, Spanning Trees, Shortest Path, Application of Graphs.

BOOKS:

1. "Data Structures using C", ISRD group Second Edition, TMH

2. "Data Structures through C", YashavantKanetkar, BPB Publications

3. "Data Structures Using C" Balagurusamy E. TMH

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. **Measurable**

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)

2. Student seminars (on topics of the syllabus and related aspects (individual activity))

3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))

4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity))

B. **General**

1. Group Discussion

2. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),

2. Closed-book and open-book tests,

3. Programming exercises,

4. Practical assignments and laboratory reports,

5. Observation of practical skills,

6. Individual and group project reports.

7. Efficient delivery using seminar presentations,

8. Viva voce interviews.

9. Computerized adaptive testing, literature surveys and evaluations,

10. Peers and self-assessment, outputs form individual and collaborative work

Semester	Course Code	Course Title	Hours	Credits
II	C2-P	DATA STRUCTURES USING C LAB	30	2

1. Write a program to read 'N' numbers of elements into an array and also perform the following operation on an array
    a. Add an element at the begging of an array
    b. Insert an element at given index of array
    c. Update a element using a values and index
    d. Delete an existing element

2. Write a program using stacks to convert a given
    a. postfix expression to prefix
    b. prefix expression to postfix
    c. infix expression to postfix

3. Write Programs to implement the Stack operations using an array

4. Write Programs to implement the Stack operations using Liked List.

5. Write Programs to implement the Queue operations using an array.

6. Write Programs to implement the Queue operations using Liked List.

7. Write a program for arithmetic expression evaluation.

8. Write a program for Binary Search Tree Traversals

9. Write a program to implement dequeue using a doubly linked list.

10. Write a program to search an item in a given list using the following Searching Algorithms
    a. Linear Search
    b. Binary Search.

11. Write a program for implementation of the following Sorting Algorithms
    a. Bubble Sort
    b. Insertion Sort
    c. Quick Sort

12. Write a program for polynomial addition using single linked list

13. Write a program to find out shortest path between given Source Node and Destination Node in a given graph using Dijkstrar's algorithm.

14. Write a program to implement Depth First Search graph traversals algorithm
15. Write a program to implement Breadth First Search graph traversals algorithm

DATABASE MANAGEMENT SYSTEMS

Semester	Course Code	Course Title	Hours	Credits
III	C3	DATABASE MANAGEMENT SYSTEMS	60	3

Course Objective:

The objective of the course is to introduce the design and development of databases with special emphasis on relational databases.

Course Learning Outcomes:

On completing the subject, students will be able to:

1. Gain knowledge of Database and DBMS.
2. Understand the fundamental concepts of DBMS with special emphasis on relational data model.
3. Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database
4. Model databaseusing ER Diagrams and design database schemas based on the model.
5. Create a small database using SQL.
6. Store, Retrieve data in database.

UNIT I

Overview of Database Management System: Introduction to data, information, database, database management systems, file-based system, Drawbacks of file-Based System, database approach, Classification of Database Management Systems, advantages of database approach, Various Data Models, Components of Database Management System, three schema architecture of data base, costs and risks of database approach.

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 and specialization, **IS A** relationship and attribute inheritance, multiple inheritance, constraints on specialization and generalization, advantages of ER modelling.

UNIT III
Relational Model: Introduction, CODD Rules, relational data model, concept of key, relational integrity, relational algebra, relational algebra operations, advantages of relational algebra, limitations of relational algebra, relational calculus, tuple relational calculus, domain relational Calculus (DRC), Functional dependencies and normal forms upto 3rd normal form.

UNIT IV
Structured Query Language: Introduction, History of SQL Standard, Commands in SQL, Data Types in SQL, Data Definition Language, Selection Operation, Projection Operation, Aggregate functions, Data Manipulation Language, Table Modification Commands, Join Operation, Set Operations, View, Sub Query.

UNIT V
PL/SQL: Introduction, Shortcomings of SQL, Structure of PL/SQL, PL/SQL Language Elements, Data Types, Operators Precedence, Control Structure, Steps to Create a PL/SQL, Program, Iterative Control, Procedure, Function, Database Triggers, Types of Triggers.

BOOKS:

1. Database System Concepts by Abraham Silberschatz, Henry Korth, and S. Sudarshan, McGrawhill
2. Database Management Systems by Raghu Ramakrishnan, McGrawhill
3. Principles of Database Systems by J. D. Ullman
4. Fundamentals of Database Systems by R. Elmasri and S. Navathe
5. SQL: The Ultimate Beginners Guide by Steve Tale.

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity

B. General

1. Group Discussion
2. Try to solve MCQ's available online.
3. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Practical assignments and laboratory reports,
4. Observation of practical skills,

5. Individual and group project reports like Create your college database for placement purpose.

6. Efficient delivery using seminar presentations,

7. Viva voce interviews.

8. Computerized adaptive testing, literature surveys and evaluations,

9. Peers and self-assessment, outputs form individual and collaborative work

Semester	Course Code	Course Title	Hours	Credits
III	**C3-P**	**DATABASE MANAGEMENT SYSTEMS LAB**	**30**	**2**

1. Draw ER diagram for hospital administration
2. Creation of college database and establish relationships between tables
3. Relational database schema of a company is given in the following figure.

Relational Database Schema - COMPANY
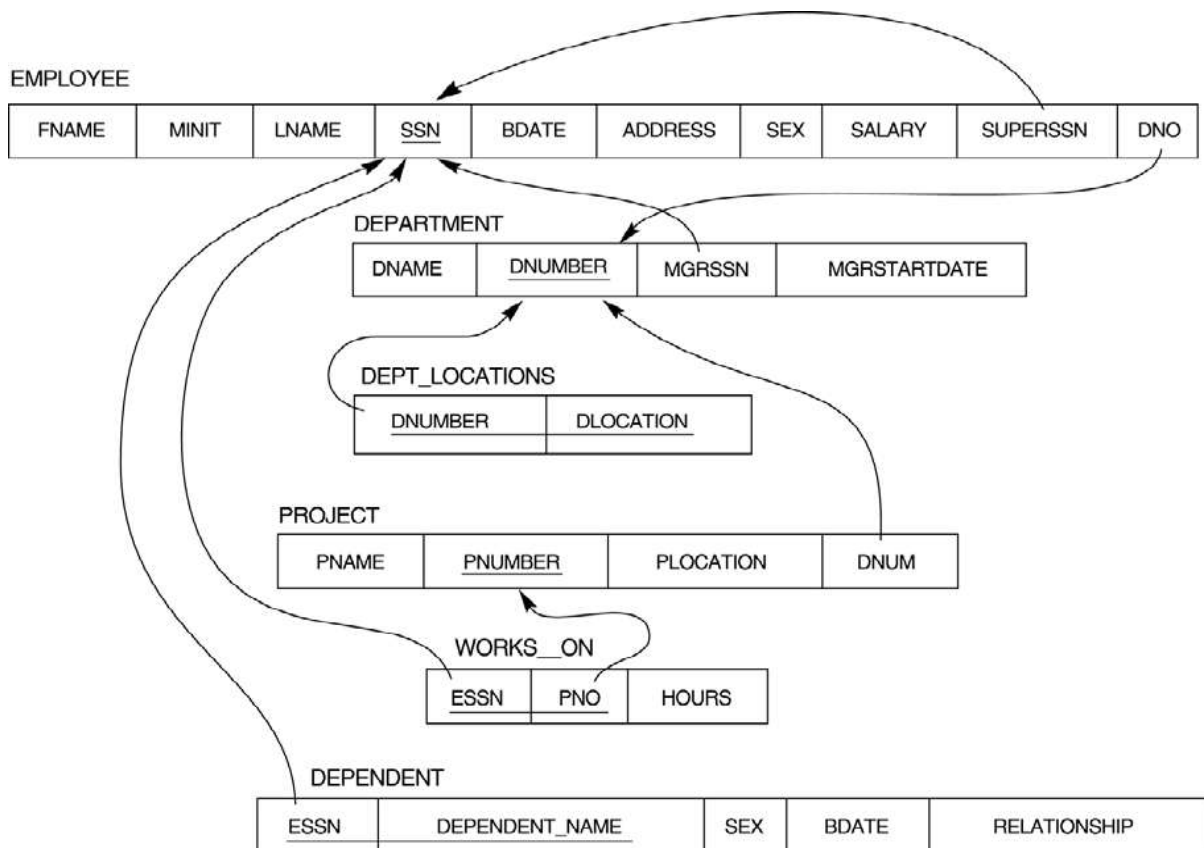
Questions to be performed on above schema

1. Create above tables with relevant ***Primary Key, Foreign Key and other constraints***
2. Populate the tables with data
3. Display all the details of all employees working in the company.
4. Display ***ssn, lname, fname, address*** of employees who work in department no 7.

5. Retrieve the *Birthdate and Address* of the employee whose name is 'Franklin T. Wong'

6. Retrieve the name and salary of every employee

7. Retrieve all distinct salary values

8. Retrieve all employee names whose address is in 'Bellaire'

9. Retrieve all employees who were born during the 1950s

10. Retrieve all employees in department 5 whose salary is between 50,000 and 60,000(inclusive)

11. Retrieve the names of all employees who do not have supervisors

12. Retrieve SSN and department name for all employees

13. Retrieve the name and address of all employees who work for the 'Research' department

14. For every project located in 'Stafford', list the project number, the controlling department number, and the department manager's last name, address, and birth date.

15. For each employee, retrieve the employee's name, and the name of his or her immediate supervisor.

16. Retrieve all combinations of Employee Name and Department Name

17. Make a list of all project numbers for projects that involve an employee whose last name is 'Narayan' either as a worker or as a manager of the department that controls the project.

18. Increase the salary of all employees working on the 'ProductX' project by 15%. Retrieve employee name and increased salary of these employees.

19. Retrieve a list of employees and the project name each works in, ordered by the employee's department, and within each department ordered alphabetically by employee first name.

20. Select the names of employees whose salary does not match with salary of any employee in department 10.

21. Retrieve the employee numbers of all employees who work on project located in Bellaire, Houston, or Stafford.

22. Find the sum of the salaries of all employees, the maximum salary, the minimum salary, and the average salary. Display with proper 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 in this department.

24. Select the names of employees whose salary is greater than the average salary of all employees in department 10.
25. Delete all dependents of employee whose *ssn is '123456789'*.
26. Perform a query using alter command to drop/add field and a constraint in Employee table.

OBJECT ORIENTATED PROGRAMMING THROUGH JAVA

Semester	Course Code	Course Title	Hours	Credits
IV	C4	OBJECT ORIENTATED PROGRAMMING THROUGH JAVA	60	3

Objectives:

To introduce the fundamental concepts of Object-Oriented programming and to design & implement object oriented programming concepts in Java.

Course Learning Outcomes: At the end of this course student will:

1. Understand the benefits of a well-structured program
2. Understand different computer programming paradigms
3. Understand underlying principles of Object-Oriented Programming in Java
4. Develop problem-solving and programming skills using OOP concepts
5. Develop the ability to solve real-world problems through software development in high-level programming language like Java

UNIT – I

Introduction to Java: Features of Java, The Java virtual Machine, Parts of Java

Naming Conventions and Data Types: Naming Conventions in Java, Data Types in Java, Literals

Operators in Java: Operators, Priority of Operators

Control Statements in Java: if... else Statement, do... while Statement, while Loop, for Loop, switch Statement, break Statement, continue Statement, return Statement

Input and Output: Accepting Input from the Keyboard, Reading Input with Java.util.Scanner Class, Displaying Output with System.out.printf(), Displaying Formatted Output with String.format()

Arrays: Types of Arrays, Three Dimensional Arrays (3D array), arrayname.length, Command Line Arguments

UNIT – II

Strings: Creating Strings, String Class Methods, String Comparison, Immutability of Strings

Introduction to OOPs: Problems in Procedure Oriented Approach, Features of Object-Oriented Programming System (OOPS)

Classes and Objects: Object Creation, Initializing the Instance Variables, Access Specifiers, Constructors

Methods in Java: Method Header or Method Prototype, Method Body, Understanding Methods, Static Methods, Static Block, The keyword 'this', Instance Methods, Passing Primitive Data Types to Methods, Passing Objects to Methods, Passing Arrays to Methods, Recursion, Factory Methods

Inheritance: Inheritance, The keyword 'super', The Protected Specifier, Types of Inheritance

UNIT – III

Polymorphism: Polymorphism with Variables, Polymorphism using Methods, Polymorphism with Static Methods, Polymorphism with Private Methods, Polymorphism with Final Methods, final Class

Type Casting: Types of Data Types, Casting Primitive Data Types, Casting Referenced Data Types, The Object Class

Abstract Classes: Abstract Method and Abstract Class

Interfaces: Interface, Multiple Inheritance using Interfaces

Packages: Package, Different Types of Packages, The JAR Files, Interfaces in a Package, Creating Sub Package in a Package, Access Specifiers in Java, Creating API Document

Exception Handling: Errors in Java Program, Exceptions, throws Clause, throw Clause, Types of Exceptions, Re – throwing an Exception

UNIT – IV

Streams: Stream, Creating a File using FileOutputStream, Reading Data from a File uingFileInputStream, Creating a File using FileWriter, Reading a File using FileReader, Zipping and Unzipping Files, Serialization of Objects, Counting Number of Characters in a File, File Copy, File Class

Threads: Single Tasking, Multi Tasking, Uses of Threads, Creating a Thread and Running it, Terminating the Thread, Single Tasking Using a Thread, Multi Tasking Using Threads, Multiple Threads Acting on Single Object, Thread Class Methods, Deadlock of Threads,

Thread Communication, Thread Priorities, thread Group, Daemon Threads, Applications of Threads, Thread Life Cycle

UNIT – V

Applets: Creating an Applet, Uses of Applets, <APPLET> tag, A Simple Applet, An Applet with Swing Components, Animation in Applets, A Simple Game with an Applet, Applet Parameters

Java Database Connectivity: Database Servers, Database Clients, JDBC (Java Database Connectivity), Working with Oracle Database, Working with MySQL Database, Stages in a JDBC Program, Registering the Driver, Connecting to a Database, Preparing SQL Statements, Using jdbc–odbc Bridge Driver to Connect to Oracle Database, Retrieving Data from MySQL Database, Retrieving Data from MS Access Database, Stored Procedures and CallableStatements, Types of Result Sets

BOOKS:

1. Core Java: An Integrated Approach, Authored by Dr. R. Nageswara Rao &Kogent Learning Solutions Inc.

2. E.Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw-Hill Company.

3. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series, TMH.

4. Deitel&Deitel. Java TM: How to Program, PHI (2007)

RECOMMENDED CO-CURRICULAR ACTIVITIES:

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B. General

1. Group Discussion

2. Try to solve MCQ's available online.

3. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),

2. Closed-book and open-book tests,

3. Programming exercises,

4. Practical assignments and laboratory reports,

5. Observation of practical skills,

6. Individual and group project reports.

7. Efficient delivery using seminar presentations,

8. Viva voce interviews.

9. Computerized adaptive testing, literature surveys and evaluations,

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Semester	Course Code	Course Title	Hours	Credits
IV	C4-P	OBJECT ORIENTATED PROGRAMMING THROUGH JAVA LAB	30	2

1. Write a program to read *Student Name, Reg.No, Marks[5]* and calculate *Total*, *Percentage, Result*. Display all the details of students

2. Write a program to perform the following String Operations
   a. Read a string
   b. Find out whether there is a given substring or not
   c. Compare existing string by another string and display status
   d. Replace existing string character with another character
   e. Count number of works in a string

3. Java program to implements Addition and Multiplication of two N X N matrices.

4. Java program to demonstrate the use of Constructor.

5. Calculate area of the following shapes using method overloading.
   a. Triangle
   b. Rectangle
   c. Circle
   d. Square

6. Implement inheritance between *Person (Aadhar, Surname, Name, DOB, and Age)* and *Student (Admission Number, College, Course, Year)*classes where ReadData(), DisplayData() are overriding methods.

7. Java program for implementing Interfaces

8. Java program on Multiple Inheritance.

9. Java program for to display *Serial Number from 1 to N* by creating two Threads

10. Java program to demonstrate the following exception handlings
    a. Divided by Zero
    b. Array Index Out of Bound
    c. File Not Found
    d. Arithmetic Exception
    e. User Defined Exception

11. Create an Applet to display different shapes such as Circle, Oval, Rectangle, Square and Triangle.

12. Write a program to create **Book (ISBN,Title, Author, Price, Pages, Publisher)**structure and store book details in a file and perform the following operations

    a. Add book details

    b. Search a book details for a given ISBN and display book details, if available

    c. Update a book details using ISBN

    d. Delete book details for a given ISBN and display list of remaining Books

OPERATING SYSTEMS

Semester	Course Code	Course Title	Hours	Credits
IV	C5	**OPERATING SYSTEMS**	60	2

Objectives:

This course aims to introduce the structure and organization of a file system. It emphasizes various functions of an operating system like memory management, process management, device management, etc.

Course Learning Outcomes:

Upon successful completion of the course, a student will be able to:

1. Know Computer system resources and the role of operating system in resource management with algorithms

2. Understand Operating System Architectural design and its services.

3. Gain knowledge of various types of operating systems including Unix and Android.

4. Understand various process management concepts including scheduling, synchronization, and deadlocks.

5. Have a basic knowledge about multithreading.

6. Comprehenddifferent approaches for memory management.

7. Understand and identify potential threats to operating systems and the security features design to guard against them.

8. Specify objectives of modern operating systems and describe how operating systems have evolved over time.

9. Describe the functions of a contemporary operating system

UNIT- I

What is Operating System? History and Evolution of OS, Basic OS functions, Resource Abstraction, Types of Operating Systems– Multiprogramming Systems, Batch Systems, Time Sharing Systems; Operating Systems for Personal Computers, Workstations and Hand-held Devices, Process Control & Real time Systems.

UNIT- II

Processor and User Modes, Kernels, System Calls and System Programs, System View of the Process and Resources, ProcessAbstraction, ProcessHierarchy, Threads, Threading Issues, Thread Libraries; Process Scheduling, Non-Preemptive and Preemptive Scheduling Algorithms.

UNIT III

Process Management: Deadlock, Deadlock Characterization, Necessary andSufficient Conditions forDeadlock, Deadlock Handling Approaches: Deadlock Prevention, Deadlock Avoidance and Deadlock Detection and Recovery.

Concurrent and Dependent Processes, Critical Section, Semaphores, Methods for Inter-process Communication; Process Synchronization, Classical Process Synchronization Problems: Producer-Consumer, Reader-Writer.

UNIT IV

Memory Management: Physical and Virtual Address Space; MemoryAllocation Strategies– Fixed and -Variable Partitions, Paging, Segmentation, Virtual Memory.

UNIT V

File and I/O Management, OSsecurity : DirectoryStructure, File Operations, File Allocation Methods, Device Management, Pipes, Buffer, Shared Memory, Security Policy Mechanism, Protection, Authentication and Internal Access Authorization

Introduction to Android Operating System, Android Development Framework, Android Application Architecture, Android Process Management and File System, Small Application Development using Android Development Framework.

REFERENCE BOOKS:

1. Operating System Principles by Abraham Silberschatz, Peter Baer Galvin and Greg Gagne (7thEdition) Wiley India Edition.
2. Operating Systems: Internals and Design Principles by Stallings (Pearson)
3. Operating Systems by J. Archer Harris (Author), Jyoti Singh (Author) (TMH)
4. Online Resources for UNIT V

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8. Viva-Voce interviews.

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Semester	Course Code	Course Title	Hours	Credits
IV	C-5	**OPERATING SYSTEMS LAB USING C/Java**	30	2

1. Write a program to implement Round Robin CPU Scheduling algorithm

2. Simulate SJF CPU Scheduling algorithm

3. Write a program the FCFS CPU Scheduling algorithm

4. Write a program to Priority CPU Scheduling algorithm

5. Simulate Sequential file allocation strategies

6. Simulate Indexed file allocation strategies

7. Simulate Linked file allocation strategies

8. Simulate MVT and MFT memory management techniques

9. Simulate Single level directory File organization techniques

10. Simulate Two level File organization techniques

11. Simulate Hierarchical File organization techniques

12. Write a program for Bankers Algorithm for Dead Lock Avoidance

13. Implement Bankers Algorithm Dead Lock Prevention.

14. Simulate all Page replacement algorithms.

    a) FIFO

    b) LRU

    c) LFU

15. Simulate Paging Techniques of memory management

SUBJECT EXPERTS

Dr.M.Ussenaiah
Dept of Computer Science,
Vikrama Simhapuri University

Dr.A.Kavitha,
Govt. Degree College,
Repalle

SYLLABUS VETTED BY

Dr.Gangadhar,
Dept of Computer Science
Acgharya Nagarjuna University,
Nagarjuna Nagar