



SKR & SKR GOVT. COLLEGE FOR WOMEN, KADAPA.
(AUTONOMOUS)

Reaccredited with 'B' Grade by NAAC

Y.S.R. Kadapa District – 516001, Andhra Pradesh, India.

Affiliated to Yogi Vemana University



AUTONOMOUS SYLLABUS

2020-2021

UG & PG





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2020-21

ENGLISH



SEMESTER – I

English Syllabus-Semester-I (modified)

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) **Parts of Speech**
- b) Concord
- 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



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ENGLISH



English Syllabus-Semester-II (modified)

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. Knowledge and Wisdom 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. Ozymandias** 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. Where the Mind is Without Fear** 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



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2020-21

ENGLISH

FOR B.A/B.Com/B.Sc COURSES under CBCS

SEMESTER –III

Unit – I

PROSE

1. M.K. Gandhi: Shyness My Shield (from The Story of My Experiments with Truth)
2. Alexis C. Madrigal: Why People Really Love Technology: An Interview with Genevieve Bell

Unit – II

POETRY

1. Gabriel Okara: Once upon a Time
2. Seamus Heaney: Digging

Unit – III

SHORT STORY

1. Jhumpa Lahiri: The Interpreter of Maladies
2. Shashi Deshpande: The Beloved Charioteer

Unit – IV

ONE ACT PLAY

Gurajada Appa Rao: Kanyasulkam, translated by C. Vijayasree & T. Vijaya Kumar (Acts I & II)

Unit – V

LANGUAGE ACTIVITY

1. Classroom and Laboratory Activities
 - i. JAM Sessions
 - ii. Note Taking
 - iii. Reporting for the Media
 - iv. Expansion of an idea
2. Classroom Activity
 - i. Transformation of sentences (Simple-Complex-Compound Sentences)
 - ii. Note Making
 - iii. Report Writing
 - iv. Writing for the Media

Note: In classroom instruction it may be ensured that the theoretical and practical components of CSS-II complement the language activity in this semester.



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DEPARTMENT OF TELUGU

SYLLABUS 2020-2021

GENERAL TELUGU

COMMON FOR BA/B.COM/B.SC

SEMESTER - I

SEM:1 COURSE – 1 PRACHINA TELUGU KAVITWAM

PATYA PRANALIKA

UNIT - I

Rajaneethi - Nannaya (MahaBharatham - Sabha ParvamPradhamaswasam

(26 nundi 57 padyamvaraku)

UNIT II

Daksha YagnamNannechodudu kumara sambhavamdviteeyaaswasam

(49nundi 86 padyamvaraku)

UNIT -III

DoumyadharmopadeshamThikkanaMahaBharathamvirataparvamPradhamaswasam(116
nundi146 padyamvaraku)

UNIT- IV

PalanatiBebbuliSreenadhudu (Palanativeeracharitra -dvipadaKavyam (puta 108nundi 112 varaku)

UNIT -V

Seetha RavanaSamvadam -MollaRaamayanamSundaraKhanda(40 nundi 87 varaku)

1. VYAKARANAM
2. SANDHULU: utwa, trika, druthaprakruthika,nugagama,
Dviruktatakaradesha,Yanadesha ,Vruddi,chutwa, Jastwa, Anunasika, Savarnaderga,
Gunasandhimodalagunavi
3. SAMASALU: Avyayibhava, TatpuruSha karmadharaya,dwandwa,dvigu, Bahuvreehi,
modalagunavi
4. ALANKARALU:Arthalaakaralu,:Upama,Utpreksha, Rupaka,Swabhavokthi,
arthantaranyasalankaramodalagunavi.
5. Sabdhalankaralu: VrutyAnuprasa, chekanuprasa,latanuprasa,antyanuprasa.
6. CHANDASSU: Vruthalu:champakamala, utpmalama,Shardulam,mathebham
7. Jathipadyalu :kandam , Dvipada.
8. Upajatulu: Ataveladi ,Tetageethi,Seesam, MutyalaSaraalu.



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GENERAL TELUGU

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SEMESTER – II

SEM:2 COURSE – 2 ADHUNIKA TELUGU SAAHITYAM

PATYA PRANALIKA



UNIT:I - ADHUNIKA KAVITWAM

1. Adhunikakavitwam -parichayam

2. Kondaveedu -Kavi kokilaDuvvuriraamireddy

(Grmdaavali-khandakaavyaalu-nakshatramaalasamputi)

3. Maatrusangeetham -Anisetty Subbarao

(Agniveena Kavitha samputinundi)

4. ShivataandavamPuttaparthi Narayana charyulu

(modatikhandikaemaandamubhumitalamuna-ilatalambuna)

UNIT II - KATHANIKA

5. Telugu Kathanika-parichayam

6. Bhayam(katha) Kaalipatnam Ramarao

7. SwedamkareduRentala Nageswara Rao

UNIT III - NAVALA

8. Telugu Navala - Parichayam

9. Radhachakralu (Navala) MaheedararamohanRao(Samkshiptaithivrutham)

10. Radha chakralu(Samekshavyasam) Dr.Yallapragadamallikarjuna Rao

UNIT -IV -NATAKAM

11. Telugu Natakamparichayam

12. Yakshaganam (Natika) M.V.S. Haranadha Rao

**13. ApurupaKalarupalavidwamsadrusyam ``Yakshaganam'' (Samekshavyasam)
Dr.KandimallaSambashiva Rao**

UNIT – V - VIMARSHA

14. Telugu sahitya vimarsha - parichayam

15. Vimarsha - SwarupaSwabhavalu, Uttamavimarshakudu – Lakshanalu



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SEMESTER – III

I- PRAACHINA KAVITHWAM:

1. Pothana – Vaamanaavatharam

AandhraMahabhadgavatham 8 vaskandam (582 – 621)

2. Koravigoparaju – SalivaahanaVijayam

SimhaasanaDwaathrimsika – 1va Aaswaasam (115 -165)

II- AADHUNIKA KAVITHWAM:

1. Kusuma Dharmanna – HarijanaSathakamu (1 -20)

**2. Rayaprolu Subbarao – SankraanthiSambaram – Misramanjarilonchi –
“AiduLakshalaAravaDedulu” nundi “Mangalam SankraanthiSaamethi” varaku.**

III- GADYA BHAAGAM (VYAASA SAMPUTI)

1. AcharyaGujjarlamudiKrupaachaari – Telugu Bhasha.

2. AcharyaRachapalyam Chandrasekhar Reddy VyakthithwaVikasam.

IV- CHANDASSU – ALANKAARAALU

**1. Chandassu – Uthpalamaala, Champakamaala, Saardulam, Mathebham, Kandam,
Tetageethi, Aataveladi.**

**2. Alankaaraalu – Upama, Rupaka, Uthpreksha, Swabhavokthi, Athisayokthi,
Ardaantharanyaasa, Drustaantha, Sabdaalankaaralu.**

V- VIDYAARTHI KRUTHAALU:

1. Telugu Vaaralu, Thidulu, Nakshathralu, SamvacharalaPerluNerchukondi.

2. Meevyakthitwaannimeeruyevidangameruguparuchukuntunnarovyasamrayandi.

3. Anthyanupraasaalankaramlookakavithanusonthangarayandi.



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DEPARTMENT OF HINDI
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GENERAL HINDI
COMMON FOR BA/B.COM/B.SC
Semester -I



I- Gadya Sandesh (Prose)

1. Sahitya Ki Mahatta - Mahaveer Prasad dwivedi
2. Sachiveevath – Sardar Poornasingh
3. Mitratha- Acharya Ramachandra Shukla

II- Kathalok(Short Story)

1. Mukthidhan- Munshi Premchand
2. Purraskar- Jaya shankara Prasad
3. UsneKhatha- Chandradhar Sharma Guleri

III- Vyakaran (Grammar)

1. Ling, Vachan, Shabd, Kal, Vachya, Vakyon ki shuddi, Shabd-Vilome, English- Hindi Paribhashik Shabd Soochi

IV- Karyalayeen Hindi (Official Language)

1. Karyalayeen Hindi
2. Shadhavali

V- Patralekhan(Letter Writing)



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DEPARTMENT OF HINDI

SYLLABUS 2020-2021

GENERAL HINDI

COMMON FOR BA/B.COM/B.SC

Semester -II



I- Gadhyasandesh (Prose)

1. Sahitya aur Sanskruthi ka PraasparSanbandh - Dr. G. Sundar Reddy
2. Bharath ek Hai - Ramdharee Sing Dinakar
3. HIV/AIDS - Prakash BathalKhandeevan Dr. Ramana Ganga Khadekar
(Anuvad-Sreenathi Sadhana Monrya)

II- Katha Lok (Short Story)

1. Vapasee - Usha Priyanvada
2. Bhokhadthal- Balashouri Reddy
3. Paramtma ka Kutta – Mohan Rakesh

III- Vyakaran (Grammar)

1. Karyalayeen Hindi Shabdavali English – Hindi
2. KaryalyoomeiPrayagHonevale Hindi – English Shabdh.
3. Vakyansh English – Hindi Shabdoo kaVakyameiPrayog

IV- Sandhi – Vichedh

V- Patra Lekhan



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DEPARTMENT OF HINDI
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GENERAL HINDI
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Semester -III



- I- Kavyadeep 9 Ancient and Modern Poetry)
1. Kabardas-sakhee (1 to 10)
 2. Soordas ka Bal Varnan
 3. Mathra Bhoomi
 4. ThodthiPaltav
 5. GeethFarosh
- II- Hindi Sabitya Ka Ethias (History of Hindi Literature)
1. Bhakthikal
- Gnanasrayi- Kabeer
Pvemasrayi-Jayasee
- III- SadhavanNibandh (General Essays)
1. Samachar Patra
 2. Beari ki Samasya
 3. Computer
 4. Paryavaran Aur Pradooshan
 5. Sahitya Aur Samaj
- IV- Anuvaad (Translation)
1. AnuvaadAbyas English se Hindi (Four or Five Lines)
- V- Prayojanmoolak Hindi (Functional Hindi)
1. Paripalna
 2. Gnapan
 3. Soochana.



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DEPARTMENT OF URDU

SYLLABUS 2020-2021

GENRAL URDU

COMMON FOR BA/B.COM/B.SC

Part - 1(b) Paper – I: URDU POETRY SEMESTER – I

UNIT – I

1. GHAZAL: MEER – Raah-e-Daur-e-Ishq me Roota hai kya
2. NAZM : Nazeer Akbarabadi – Kaliug

UNIT – II

1. GHAZAL : GHALIB – Dard Minnat kash-e-Dawa na hua
2. NAZM : SHIBLI – Adl-e-Farooqi

UNIT – III

1. GHAZAL : MOMIN – Who jo Hum me Tum me Qaraar tha
2. NAZM : IQBAL – Chaand aur Tare

UNIT – IV

1. GHAZAL : DAGH DEHLAVI – Duniya me Aadmi ko Museebat Kahan nahi
2. NAZM : AKBAR – Nasechat-e-Akhlaqi

UNIT – V

1. GHAZAL : JIGAR MURADABADI – Koi Ye Kehde Gulshan Gulshan
2. NAZM : FAIZ – Lauh-o-Qalam

SUGGESTED READING:

- 1-URDU SHAIKY KA FANNI IRTEQA – FARMAN FATEHPOOR
- 2-URDU GHAZAL – KAAMIL QURAIISHI
- 3-URDU SHAIRI KA TANQEEDI MUTA'A – SUMBUL NIGAAR



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DEPARTMENT OF URDU
SYLLABUS 2020-2021
GENRAL URDU
COMMON FOR BA/B.COM/B.SC



Syllabus for (B.A./ B.Com. / B.Sc.) U.G. under CBCS
Second Language – Urdu
First Year Degree Course Second Language Part - 1(b)

Paper – II: URDU POETRY

SEMESTER - II

- UNIT – I MASNAWI
MEER HASAN – *Aaghaaz-e-Dastaan* (Sehrul Bayan)
- UNIT – II MARSIIYA
MEER ANEES – *Jab Qataa Ki Masafat-e-Shab Aaftaab ne*
(Ibtedayi 6 Bandh)
- UNIT – III QASEEDA
GHALIB – *Dar Madh-e- Bahadur Shah Zafar*
(*Haan Mahe Nau Sunen Hum Uska Naam*)
- UNIT – IV RUBAIYAAT

AMJAD HYDERABADI
1. *Rutba Jise Duniya me Khuda Deta hai*
2. *Har Cheez Mussabab-e-Sabab se Maangoo*
SAGHAR JAYYEDI
1. *Tareef ki Meezan pe Tul jate hain*
2. *Zulmat ka Toofan Utha deta hai*
- UNIT – V TA'ARUF
Muthtasar Ta'aruf aur Sawanehi Haalat
1. *Amjad Hyderabad*
2. *Saghar Jayyedi*

SUGGESTED READING:

URDU SHAIRI KA TANQEEDI MUTA'A – SUMBUL NIGAAR
TAREEK-E-ADAB-E-URDU – NOORUL HASAN NAQUI
MUKHTASAR TAREEK-E-ADAB-E-URDU – EJAZ HUSSAIN



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DEPARTMENT OF URDU

SYLLABUS 2020-2021

GENERAL URDU

COMMON FOR BA/B.COM/B.SC

PART- 1 (B) URDU

SEMESTER - III

Common to B.A/B.Com/B.Sc/BBA

Prose and Poetry

UNIT – I Dastan – Mir Amman– Bagh-o-Bahar-Aghaz Khisse ka

UNIT – II Khutoote Ghalib –Banaam Mir Mehdi Majrooh
Aur Hatim Ali Mehar

UNIT – III Masnavi – Ibne Nishati – Phoolbun – Aaghaze Dastan -
21 Sher

UNIT – IV Marsiya – Meer Anees – Jab Qata ki masafate shab
aaftab ne (Ibtidavi 6 band musaddas ke)

UNIT – V Rubaiyaat

1. Amjad Hyderabad – ‘Har cheez ka khona bhi’
2. Saghar Jayvedi – ‘Tareef ki meezaan pe tul jate hain’

Prescribed Book: MUNTAKHAB ADAB – II





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2020-21

Life Skill course

B.Sc. / B.Com / B.A

Revised Syllabus under CBCS w.e.f. 2020-2021

LIFE SKILL COURSE
BASIC COMPUTER APPLICATIONS

Semester	Course Code	Course Title	Hours	Credits
I	Life skill course	BASIC COMPUTER APPLICATIONS	30	2

Objectives:

This course aims at providing exposure to students in skill development towards basic office applications.

Course Learning Outcomes:

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

1. Demonstrate basic understanding of computer hardware and software.
2. Apply skills and concepts for basic use of a computer.
3. Identify appropriate tool of MS office to prepare basic documents, charts, spreadsheets and presentations.
4. Create personal, academic and business documents using MS office.
5. Create spreadsheets, charts and presentations.
6. Analyze data using charts and spread sheets.

Unit-I: (08 hrs)

Basics of Computers: Definition of a Computer - Characteristics of computers, Applications of Computers – Block Diagram of a Digital Computer – I/O Devices, hardware, software human ware, application software, system software, Memories - Primary, Auxiliary and Cache Memory.

MS Windows – Desktop, Recycle bin, My Computer, Documents, Pictures, Music, Videos,



Task Bar, Control Panel.

Unit-II: (08 hrs)

MS-Word : Features of MS-Word - MS-Word Window Components - Creating, Editing, Formatting and Printing of Documents – Headers and Footers – Insert/Draw Tables, Table Auto format – Page Borders and Shading – Inserting Symbols, Shapes, Word Art, Page Numbers, Mail Merge.

Unit-III: (10 hrs)

MS-Excel : Overview of Excel features – Creating a new worksheet, Selecting cells, Entering and editing Text, Numbers, Inserting Rows/Columns –Changing column widths and row heights, Formulae, Referencing cells , Changing font sizes and colors, Insertion of Charts, Auto fill, Sort.

MS-PowerPoint: Features of PowerPoint – Creating a Presentation - Inserting and Deleting Slides in a Presentation – Adding Clip Art/Pictures -Inserting Other Objects, Audio, Video - Resizing and scaling of an Object – Slide Transition – Custom Animation.

RECOMMENDED CO-CURRICULAR ACTIVITIES: (04 hrs)

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

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside
 - a. the syllabus content. Shall be individual and challenging))
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz, Group Discussion
4. Solving MCQ's available online.
5. Suggested student hands on activities:
 - Create two folders, Rename the folder, create two files each using notepad and paint, move the files from one folder to another folder, delete a file you have created, copy and paste text within notepad.
 - Create a letter head for your college with watermark, your resume, visiting card, brochure for your college activity, organization chart for your college, any advertisement, Prepare your Class time table.



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2020-21

Life Skill course

HUMAN VALUES AND PROFESSIONAL ETHICS (HVPE)

(SYLLABUS)

Learning Outcome:

On completion of this course, the UG students will be able to

- ✓ Understand the significance of value inputs in a classroom and start applying them in their life and profession
- ✓ Distinguish between values and skills, happiness and accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual, etc.
- ✓ Understand the value of harmonious relationship based on trust and respect in their life and profession
- ✓ Understand the role of a human being in ensuring harmony in society and nature.
- ✓ Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.

UNIT: 1 Introduction – Definition, Importance, Process & Classifications of Value Education

- ❖ Understanding the need, basic guidelines, content and process for Value Education
- ❖ Understanding the thought provoking issues; need for Values in our daily life
- ❖ Choices making – Choosing, Cherishing & Acting
- ❖ Classification of Value Education: understanding Personal Values, Social Values, Moral Values & Spiritual Values.

UNIT: 2 Harmony in the Family – Understanding Values in Human Relationships

- ✓ Understanding harmony in the Family- the basic unit of human interaction
- ✓ Understanding the set of proposals to verify the Harmony in the Family;
- ✓ Trust (*Vishwas*) and Respect (*Samman*) as the foundational values of relationship
- ✓ Present Scenario: Differentiation (Disrespect) in relationships on the basis of body, physical facilities, or beliefs.
- ✓ Understanding the Problems faced due to differentiation in Relationships
- ✓ Understanding the harmony in the society (society being an extension of family): *Samadhan*, *Samridhi*, *Abhay*, *Sah-astitva* as comprehensive Human Goals
- ✓ Visualizing a universal harmonious order in society- Undivided Society (*AkhandSamaj*), Universal Order (*SarvabhaumVyawastha*)- from family to world family.

UNIT: 3 Professional Ethics in Education

- ✓ Understanding about Professional Integrity, Respect & Equality, Privacy, Building Trusting Relationships.
- ✓ Understanding the concepts; Positive co-operation, Respecting the competence of other professions.
- ✓ Understanding about Taking initiative and Promoting the culture of openness.
- ✓ Depicting Loyalty towards Goals and objectives.



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2020-21

Life Skill course

LIFE SKILL COURSE

ENTREPRENEURSHIP DEVELOPMENT

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

(To be Implemented from 2020-21 Academic Year)

Sl. No	Code	Sem	Course	Name of Life Skill Course (Course consists 3 Units)	Hours/ Week	Credits	Marks (Sem-End)
1		I		Entrepreneurship Development	2	2	50

Syllabus

ENTREPRENEURSHIP DEVELOPMENT

(Total 30Hrs)

Course Objective: A Generic Course that is intended to inculcate an integrated personal Life Skill to the student.

Learning Outcomes:

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

- Understand the concept of Entrepreneurship, its applications and scope.
- Know various types of financial institutions that help the business at Central, State and Local Level
- Understand Central and State Government policies, Aware of various tax incentives, concessions
- Applies the knowledge for generating a broad idea for a starting an enterprise/start up
- Understand the content for preparing a Project Report for a start up and differentiate between financial, technical analysis and business feasibility.

Syllabus:

Unit-I: Entrepreneurship: Definition and Concept of entrepreneurship - Entrepreneur Characteristics – Classification of Entrepreneurs – Role of Entrepreneurship in Economic Development – Start-ups.

Unit-II: Idea Generation and Project Formulation: Ideas in Entrepreneurships – Sources of New Ideas – Techniques for Generating Ideas – Preparation of Project Report – Contents; Guidelines for

Report preparation – Project Appraisal Techniques – Economic Analysis – Financial Analysis – Market Analysis.

Unit-III: Institutions Supporting and Taxation Benefits: Central level Institutions: NABARD; SIDBI, – State Level Institutions – DICs – SFC - Government Policy for MSMEs - Tax Incentives and Concessions.

Reference Books:

1. Arya Kumar, Entrepreneurship, Pearson, Delhi
2. Poornima MCH, Entrepreneurship Development – Small Business Enterprises, Pearson, Delhi
3. Sangeetha Sharma, Entrepreneurship Development, PHI Learning
4. Kanishka Bedi, Management and Entrepreneurship, Oxford University Press, Delhi



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Y.S.R. Kadapa District – 516001, Andhra Pradesh, India.

Affiliated to Yogi Vemana University



2020-21

Life Skill course

Semester-II

B.Sc./B.Com/B.A

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

INFORMATION & COMMUNICATION TECHNOLOGY

Semester	Course Code	Course Title	Hours	Credits
II	Life skill Course	INFORMATION & COMMUNICATION TECHNOLOGY	30	2

Objectives:

This course aims at acquainting the students with basic ICT tools which help them in their day to day and life as well as in office and research.

Course outcomes: After completion of the course, student will be able to;

1. Understand the literature of social networks and their properties.
2. Explain which network is suitable for whom.
3. Develop skills to use various social networking sites like twitter, flickr, etc.
4. Learn few GOI digital initiatives in higher education.
5. Apply skills to use online forums, docs, spreadsheets, etc for communication, collaboration and research.
6. Get acquainted with internet threats and security mechanisms.

SYLLABUS:

UNIT-I: (08 hrs)

Fundamentals of Internet: What is Internet?, Internet applications, Internet Addressing – Entering a Web Site Address, URL–Components of URL, Searching the Internet, Browser –Types of Browsers, Introduction to Social Networking: Twitter, Tumblr, LinkedIn, Facebook, flickr, Skype, yahoo, YouTube, WhatsApp .

UNIT-II:(08 hrs)

E-mail: Definition of E-mail -Advantages and Disadvantages –User Ids, Passwords, Email Addresses, Domain Names, Mailers, Message Components, MessageComposition, Mail Management.

UNIT-III:(10 hrs)

Overview of Internet security, E-mail threats and secure E-mail, Viruses and antivirus software, Firewalls, Cryptography, Digital signatures, Copyright issues.

What are GOI digital initiatives in higher education? (SWAYAM, SwayamPrabha, National Academic Depository, National Digital Library of India, E-Sodh-Sindhu, Virtual labs, e-acharya, e-Yantra and NPTEL).

RECOMMENDED CO-CURRICULAR ACTIVITIES: (04 hrs)

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



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2020-21

Life Skill course

Semester-II

B.A., B. Com & B. Sc Programmes

Revised CBCS w.e.f 2020-21

LIFE SKILL COURSE

Indian Culture & Science

Total 30 hrs (02 h/wk, 02 Cr & Max 50 Marks)

Learning Outcomes:

By successful completion of the course, students will be able to:

1. Understand the evolution of India's culture
2. Analyze the process of modernization of Indian society and culture from past to future
3. Comprehend objective education and evaluate scientific development of India in various spheres
4. Inculcate nationalist and moral fervor and scientific temper

Syllabus:

Unit – I: Unity in Diversity in India: (09 hrs)

Coexistence of various religions since ancient times - Hinduism, Buddhism, Jainism and Atheism, and later Sikhism, Islam and Christianity
The Bhakti (Vishnavite and Saivaite) and Sufi Movements
The concepts of seela, karuna, kshama, maitri, vinaya, santhi and ahimsa Achievements in Literature, Music, Dance, Sculpture and Painting - Craftsmanship in cloth, wood, clay, metal and ornaments
Cultural diversity, Monogamy, Family system, Important seasonal festivals

Unit – II: Social Reforms and Modern Society: (09 hrs)

Reforms by Basaveswara - Raja Rama Mohan Roy – Dayananda Saraswathi –Swamy Vivekananda –Mahatma Gandhi - B. R. Ambedkar - Reforms in Andhra by Vemana, Veerabrahmam, Gurajada, Veeresalingam and GurrarnJashua (only reforms in brief, biographies not needed)
Modern Society: Family unity, Community service, Social Harmony, Civic Sense, Gender Sensitivity, Equality, National Fervor

Unit – III: Science and Technology: ((09 hrs)

Objectivity and Scientific Temper – Education on Scientific lines (Bloom's Taxonomy) - Online Education
Developments in Industry, Agriculture, Medicine, Space, Alternate Energy, Communications, Media through ages



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2020-21

Life Skill course

Semester-II

Elementary Statistics

Objective: To provide basic understanding of general statistical tools and their elementary applications and to create awareness on Indian Statistical System.

Learning outcomes

Unit-I: To understand the concept of Statistics and its merits and demerits. Distinguishing primary and secondary data. Classification, Tabulation and Pictorial representation of data.

Unit - II: To understand the basic nature of data and how a single value describes the entire data set. Measuring the degree of departure of a distribution from symmetry and reveals the direction of scatterness of the items.

Unit - III: To understand the spread of the data and to draw conclusions from the comparison of averages.
To understand the concept of correlation and regression and to learn the degree of association between two variables and establishing relationship between the variables.

Unit I: Meaning, scope and limitations of Statistics

Collection of data: Primary and Secondary, Classification and Tabulation, Construction of frequency distribution.

Graphical Representation: Histogram, Bar, Pie and Frequency polygon.
(8hrs)

Unit II: Measures of Central Tendency: Features of good average, Arithmetic Mean, Median, Mode. Empirical relationship between Mean Median and Mode and skewness based on central values. (8hrs)

Unit III: Measures of Dispersion: Range, Quartile Deviation(QD), Mean Deviation(MD), Variance, Standard Deviation(SD), relationship between QD, MD and SD. Familiarization of the concepts relating to Correlation and Linear Regression line. (8hrs)



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2020-21

Skill Development Courses

Semester-I

B.A., B. Com & B. Sc Programmes

Revised CBCS w.e.f. 2020-21

SKILL DEVELOPMENT COURSES

Arts Stream

Tourism Guidance

Total 30 hrs (02 h/wk, 02 Cr & Max 50 Marks)

Learning Outcomes:

By successful completion of the course, students will be able to:

1. Understand the basic tourism aspects
2. Comprehend the requirements, role and responsibilities of profession of a Tourist Guide
3. Apply the knowledge acquired in managing different groups and guiding in a tour
4. Explain basic values related to tourism and heritage

Syllabus:

Unit I: (06 hrs)

Tourism – What is Tourism - Characteristics of Tourist Places – Guidance in Tourism - Meaning of Guidance – Types of Tour Guidance - Government/Department Regulations

Unit II: (10 hrs)

Types of Guides – Characteristics of a Guide - Duties and Responsibilities of a Guide - The Guiding Techniques –Guide's personality- Training Institutions – Licence. Leadership and Social Skills - Presentation and Communication Skills - Working with different age and linguistic groups - Working under difficult circumstances – Precautions at the site -Relationship with Fellow Guides and Officials.

Unit III: (10 hrs)

Guest Relationship Management- Personal and Official - Arrangements to Tourists – Coordinating transport - VISA/Passport -Accident/Death -Handling Guests with Special Needs/ Different Abilities –Additional skills required for Special/Adventure Tours - Knowledge of Local Security and Route Chart – Personal Hygiene and Grooming - Checklist - Code of Conduct

Co-curricular Activities Suggested: (04 hrs)

1. Assignments, Group discussion, Quiz etc.
2. Invited lecture/training by local tourism operators/expert/guides
3. Visit to local Tourism Department office and a tourist service office
4. Organisation of college level short-duration tours to local tourist sites.



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2020-21

Skill Development Courses

Semester-I

A.P. State Council of Higher Education

B.A., B. Com & B. Sc Programmes

Revised CBCS w.e.f 2020-21

SKILL DEVELOPMENT COURSES

(To be offered from Semesters I to IV)

Arts Stream

PUBLIC RELATIONS

Total 30 hrs (02 h/wk, 02 Cr & Max 50 Marks)

Course Outcomes:

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

1. Understand the historical background and role Public Relations in various areas
2. Have insight into the use of the technological advancements in Public Relations
3. Comprehend tools of Public Relations in order to develop the required skills.
4. Understand the ethical aspects and future of Public Relations in India
5. Develop writing skills for news papers and creation of Blogs.

Syllabus:

Unit I	Public Relations-Meaning, Definition, Nature and Scope, Historical Background,
06 Hrs	Technological and Media Revolution and Role in Business, Government, Politics, NGOs and Industry.
Unit II	Concepts of Public Relations-Press, Publicity, Lobbying, Propaganda, Advertising,
10 Hrs	Sales Promotion and Corporate Marketing Services, Tools of Public Relations-Press Conferences, Meets, Press Releases, Announcements, Webcasts
Unit III	Public Relations and Mass Media, Present and future of Public Relations in India,
10 Hrs	Ethics of Public Relations and Social Responsibility, Public Relations and Writing-Printed Literature, Newsletters, Opinion papers and Blogs

Co-curricular Activities Suggested: (04 Hrs)

1. Invited lecture by local field expert/eminant personality on Public Relations
2. Visit to Press
3. Opinion Survey, Media Survey and Feedback
4. Case Studies
5. Organising mock press conferences, exhibitions
6. Assignments, Group discussion, Quiz etc.

Reference Books:

1. Brown, Rob, Public Relations and the Social Web, Kogan Page India, New Delhi, 2010.
2. Cutlipscottetal, Effective Public Relations, London, 1995.
3. Black Sam, Practical Public Relations, Universal Publishers, 1994.
4. S.M.Sardana, Public Relations: Theory and Practice.



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2020-21

Skill Development Courses

Semester-I

Revised CBCS w.e.f 2020 - 21
To be Offered from Semester I to IV
SKILL DEVELOPMENT COURSE
COMMERCE STREAM

OFFICE SECRETARYSHIP

SYLLABUS

Learning Outcomes:

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

1. Understand the organizational hierarchy and outlines of functioning
2. Comprehend the role of office secretaryship in a small and medium organization
3. Acquire knowledge on office procedures and interpersonal skills
4. Apply the skills in preparing and presenting notes, letters, statements, reports in different situations.

Syllabus

UNIT I: 06 hrs

Introduction – Organisational structure of a small and medium organization – Types of offices - Kinds of secretaries - The scope of office secretaryship

UNIT II: 10 hrs

The role of an office secretary -Duties and responsibilities- Usage of different devices - Flowchart and office manuals – Coordinating different wings of an office/organisation – Arranging common meetings - Operations of banking and financial services - travel and hospitality management services

UNIT III: 10hrs

Office procedures – Filing– Circulating files - Preparation of notes, circulars, agenda and minutes of meetings – Issue of press notes - Maintenance of files and records - Inventory, office, human resources, financial and confidential - maintaining public relations.

Co curricular Activities: 04 hrs

1. Visit various organizations (Hospitals, Hotels, Hospitality centers)
2. Preparation of appointment letters, dismissal letters, memos, Issue of appreciation/ motivation letters,
3. Releasing of Press notes, notices and circulars
4. Arranging invited lectures from office executives, auditors and managers
5. Assignments, Group discussion, Quiz etc.

Reference books:

1. Rapidex Professional course - PustalMahal Group



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Skill Development Courses
Semester-I

B A, B Com & B Sc Programmes

Revised CBCS w.e.f. 2020-21
SKILL DEVELOPMENT COURSES
To be Offered from Semesters I to IV

COMMERCE STREAM

Syllabus of
INSURANCE PROMOTION
Total 30 hrs (02h/wk), 02 Credits & Max 50 Marks

Learning Outcomes:

By successful completion of the course, students will be able to;

1. *Understand the field level structure and functioning of insurance sector and it's role in protecting the risks*
2. *Comprehend pertaining skills and their application for promoting insurance coverage*
3. *Prepare better for the Insurance Agent examination conducted by IRDA*
4. *Plan 'promoting insurance coverage practice' as one of the career options.*

SYLLABUS:

Section I: 06 Hrs

Introduction of Insurance - Types of insurances. Growth of Insurance sector in India - Regulatory mechanism (IRDA) - Its functions

Section II: 10 Hrs

Life Insurance plans. Health insurance plans. Products and features. Contents of documents- Sales Promotion methods - Finding prospective customers -Counselling - Helping customers in filing - Extending post-insurance service to customers.

Section III : 10 Hrs

General Insurance - It's products (Motor, Marine, Machinery, Fire, Travel and Transportation) and features. Contents of documents. Dealing with customers - Explaining Products to Customers - Promoting Customer loyalty. Maintenance of Records.

Co-curricular Activities Suggested: (4 hrs)

1. Collection of pamphlets of various insurance forms and procedures
2. Invited Lectures by Development Officers concerned



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2020-21

Skill Development Courses

Semester-I

B A, B Com & B Sc Programmes

Revised CBCS w.e.f. 2020-21

SKILL DEVELOPMENT COURSES

SCIENCE STREAM

Syllabus of

ELECTRICAL APPLIANCES

Total 30 hrs (02h/wk),

02 Credits & Max Marks :50

Learning Outcomes:

By successful completion of the course, students will be able to:

1. *Acquire necessary skills/hand on experience/ working knowledge on multimeters, galvanometers, ammeters, voltmeters, ac/dc generators, motors, transformers, single phase and three phase connections, basics of electrical wiring with electrical protection devices.*
2. *Understand the working principles of different household domestic appliances.*
3. *Check the electrical connections at house-hold but will also learn the skill to repair the electrical appliances for the general troubleshoots and wiring faults.*

SYLLABUS:

UNIT-I

(6 hrs)

Voltage, Current, Resistance, Capacitance, Inductance, Electrical conductors and Insulators, Ohm's law, Series and parallel combinations of resistors, Galvanometer, Ammeter, Voltmeter, Multimeter, Transformers, Electrical energy, Power, Kilowatt hour (kWh), consumption of electrical power

UNIT-II

(10 hrs)

Direct current and alternating current, RMS and peak values, Power factor, Single phase and three phase connections, Basics of House wiring, Star and delta connection, Electric shock, First aid for electric shock, Overloading, Earthing and its necessity, Short circuiting, Fuses, MCB, ELCB, Insulation, Inverter, UPS

UNIT-III

(10 hrs)

Principles of working, parts and servicing of Electric fan, Electric Iron box, Water heater; Induction heater, Microwave oven; Refrigerator, Concept of illumination, Electric bulbs, CFL, LED lights, Energy efficiency in electrical appliances, IS codes & IE codes.

Co-curricular Activities (Hands on Exercises): (04 hrs)

[Any four of the following may be taken up]



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Skill Development Courses

Semester-I

B.A, B.Com & B.Sc. PROGRAMMES

Revised CBCS w.e.f. 2020-21
SKILL DEVELOPMENT COURSES
Science Stream

Syllabus of **PLANT NURSERY**

Total 30 hrs (02h/wk),

02 Credits & Max Marks: 50

Learning Outcomes :

On successful completion of this course students will be able to;

1. Understand the importance of a plant nursery and basic infrastructure to establish it.
2. Explain the basic material, tools and techniques required for nursery.
3. Demonstrate expertise related to various practices in a nursery.
4. Comprehend knowledge and skills to get an employment or to become an entrepreneur in plant nursery sector.

Syllabus:

Unit-1 :Introduction to plant nursery

06 Hrs.

1. Plant nursery: Definition, importance.
2. Different types of nurseries –on the basis of duration, plants produced, structure used.
3. Basic facilities for a nursery; layout and components of a good nursery.
4. Plant propagation structures in brief.
5. Bureau of Indian Standards (BIS-2008) related to nursery.

Unit- 2 :Necessities for nursery

09 Hrs.

1. Nursery beds – types and precautions to be taken during preparation.
2. Growing media, nursery tools and implements, and containers for plant nursery, in brief.
3. Seeds and other vegetative material used to raise nursery in brief.
4. Outlines of vegetative propagation techniques to produce planting material.
5. Sowing methods of seeds and planting material.

Unit-3 :Management of nursery

09 Hrs.

1. Seasonal activities and routine operations in a nursery.
2. Nursery management – watering, weeding and nutrients; pests and diseases.
3. Common possible errors in nursery activities.
4. Economics of nursery development, pricing and record maintenance.
5. Online nursery information and sales systems.



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2020-21

Skill Development Courses

Semester-II

B.A., B. Com & B. Sc Programmes

Revised CBCS w.e.f 2020-21

SKILL DEVELOPMENT COURSES

Arts Stream

JOURNALISTIC REPORTING

Total 30 hrs (02 h/wk, 02 Cr & Max 50 Marks)

Course Outcomes:

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

1. Understand the evolution of journalism with a focus on its development in India.
2. Comprehend the role of Press in the Indian democracy and various reporting methods.
3. Realise the ethical aspects of Journalism in India
4. Develop basic writing skills for news papers, Radio and Television.

Syllabus:

Unit-I: 06 Hrs

Introduction to Journalism-Nature, Growth and Development in post independence era -Print Media, Mass Media and Electronic Media, Press as a Fourth Estate-Role of Press in Democracy.

Unit-II: 10 Hrs

Concept of News-News Values-Sources of News - News gathering ways: Press Conferences, Press Releases, Events, Meets, Interviewing-Types of Interviews and Interviewing Techniques- Methods of News Writing: Leads, News Stories and Body Development.

Unit- III 10 Hrs

Reporting-Kinds of Reporting-Objectives, Interpretative, Investigative, Legal, Developmental, Political, Sports, Crime, Economic, Commercial, Disaster, Technical and Scientific Reporting-Writing Special features: Photo features, Human interest features, Profiles, Column Writing, Writing for Radio and Television-Values and Ethics of Journalism.

Co-curricular Activities Suggested: (04 Hrs)

1. Collection and study of various English and Telugu Newspapers
2. Invited lecture/basic training by local experts
3. Visit to local Press office
4. Informally attending Press Conferences and Meets and taking notes
5. Assignments, Group discussion, Quiz etc.

Reference Books:

1. Mencher Melvin, News Reporting and Writing, 1997, Columbia University Press.
2. Mazumdar Aurobindo, Indian Press and Freedom Struggle, 1993, Orient Longman.
3. Barun Roy, Beginners Guide to Journalism and Mass Communication, V&S Publishers, New Delhi.



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Skill Development Courses

Semester-II

Learning Outcomes:

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

1. *Understand the basics of survey and reporting needs and methods*
2. *Comprehend designing of a questionnaire*
3. *Conduct a simple and valid survey and Collect data*
4. *Organize and interpret data and Prepare and submit report.*

Syllabus:

- Unit I** 08Hrs Survey: Meaning and Definition –Identifying need for survey - Identifying Sample –Characteristics of Sample - Types of Survey – Survey Methods – Advantages and Disadvantages of Survey – Essential Steps in Survey – Online Survey.
- Unit II** 09Hrs Preparing Questionnaire: Types and Parts of Questionnaire – Qualities of good Questionnaire – Precautions inPreparing Questionnaire Administering/Piloting Questionnaire –Collection of data -Dealing with People – Maintaining objectivity/neutrality.
- Unit III** 10Hrs Methods of Organizing data – Forms of data presentation - Tables and Figures – Basic Statistical Methods of Analysis of data –Percentages - Mean, Mode and Median –Simple Ways of showing Results– Tables/Graphs/Diagrams Report Writing: Forms of Reporting - Parts of a Report - Title page to Acknowledgements -Characteristics of a Good Report – Style of language to be used - Explaining Data in the Report – Writing fact-based Conclusions – making Recommendations – Annexing required material.

Recommended Co-curricular Activities (03 hrs):

1. Invited Lecture/Training by a Local Expert
2. Collection and study of questionnaires
3. Preparation of sample questionnaire and conduct a live sample survey
4. Preparation of a sample Report
5. Assisting a real time field survey and report writing
6. Assignments, Group discussion, Quiz etc.



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2020-21

Skill Development Courses

Semester-II

B.A., B. Com., B.Sc. etc. Programmes
(Revised CBCS w.e.f.2020-2021)

**Skill Development Courses
To be offered from Semesters I to IV**

ARTS STREAM

Syllabus of
SOCIAL WORK

(Total 25 hrs (02h/wk), 02 Credits & Max. 50 Marks)

Learning Outcomes:

By successful completion of the course, students will be able to:

1. Understand the basic concepts relating to social work practice, values, principles of social work and social problems in India
2. List out different approaches of providing help to the people in need.
3. Acquaint the process of primary methods of social work
4. Get to know the skills of working with individuals, groups and communities.

Syllabus

Unit-I:(07Hrs)- Introduction to social work and concepts related to social work

Introduction to Social Work- Definition- Scope- objectives - Functions- social service, social welfare services, social reform, major social problems in India; Social work philosophy, values, objectives, principles, methods and fields of social work.

Unit-II:(09Hrs) Methods of Working with Individuals and Groups

Social case work –Definition-scope and importance of social case work, principles and process of social case work -Tools and techniques in social case work- Counselling skills. Social Group Work-Definition-scope- the need for social group work –Group work process - Principles of Group Work -Stages of Group Work-Facilitation skills and techniques.

Unit-III: (09Hrs)Workingwith Communitiesand Field Work in social work

Community – definition - characteristics- types- community organisation as a method of social work-definition-objectives-principles- phases of community organization -



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2020-21

Skill Development Courses
Semester-II

Revised CBCS w.e.f. 2020-21
SKILL DEVELOPMENT COURSES

ARTS STREAM

Syllabus of
PERFORMING ARTS

Total 30 hrs (02h/wk), 02 Credits & Max. 50 Marks

Learning Outcomes:

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

1. Acquire the basic knowledge in performing arts
2. Understand the modern stage and performance on the stage
3. Comprehend and improve the skills related to performing arts on the stage
4. Understand various Telugu folk arts and their significance
5. Know the modes of presentation and skills pertaining to folk arts.

SYLLABUS:

Unit-I: Introduction to performing Arts

06 Hrs

Arts – and its definition; Fine Arts; Arts - Learning & Imitation – Rasaas, Bhaavas and Rasa Sutra. Dasaropakaas; Nritha, Nrithya, Natya; Action – Kinds of Actions; Ancient Costume style

Unit-II: Performing Arts – Stage Arts

10 Hrs

Origin of Drama (Theatre); Features of Stage; Varieties of Modern Telugu Drama; Famous Telugu Dramas.

Stage performance; Dramatic Actor and its definition; Actor-characteristics, Functions and Responsibilities.

Traits of an Actor – Diction, Articulation, Dialogue modulation, Time sense, Observation, Mime, Improvisation, Commentary,

Dress code, Make-up, lighting & Stage Direction.

Unit-III: Performing Arts – Forms

10 Hrs

Folk Arts, their nature and significance – Brief introduction to Pagaveshalu, Bommalaatalu, Veedhinaatakaalu, Yakshagaanaalu, Harikathalu, Burrakathalu, Oggukathalu, Chindu, Yakshaganam, Kolaatam and Pulivesham.

Co-curricular Activities Suggested: (4 hrs)



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Skill Development Courses

Semester-II

Revised CBCS w.e.f. 2020-21
SKILL DEVELOPMENT COURSES

COMMERCE STREAM

AGRICULTURAL MARKETING

Total 30 hrs (02h/wk), 02 Credits & Max 50 Marks

Learning Outcomes:

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

1. Know the kinds of agricultural products and their movement
2. Understand the types, structure and functioning of agricultural marketing system
3. Comprehend related skills and apply them in sample situations
4. Extend this knowledge and skills to their production/consumption environment

SYLLABUS:

Unit- I: 06hrs

Introduction of Agriculture and agricultural products (including agriculture, horticulture, sericulture, floriculture, aquaculture- genetic culture and dairy product) - Agricultural Marketing - Role of marketing - Concepts - Goods and services - Movement of product from farm to consumer - Middlemen - Moneylenders - Types of agricultural markets (basic classification).

Unit- II: 09hrs

Basic structure and facilities of an agricultural market - Primary, secondary and tertiary markets - Functioning of Market Yards - Market information - RythuBharosaKendras (RBK) - Govt market policies and regulations - Contract farming - Govt Apps for marketing of agri products.

Unit- III: 10hrs

Planning production - assembling - grading - transportation - storage facilities. Price fixation. Dissemination of market information - and role of ICT. Marketing - Mix - Product element - Place element - Price element - Promotion element. Selection of target market. Government programs in support of Agricultural marketing in India.

Suggested Co-curricular Activities: 05hrs

1. Study visit to agricultural markets and RythuBharosaKendras (RBK)
2. Invited lecture by field expert



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2020-21

Skill Development Courses
Semester-II

SKILL DEVELOPMENT COURSE

COMMERCE STREAM

BUSINESS COMMUNICATION

Total 30 hrs (02hrs/wk), 02 Credits, Max 50 marks

Learning Outcomes:

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

1. *Understand the types of business communication and correspondence*
2. *Comprehend the processes like receiving, filing and replying*
3. *Acquire knowledge in preparing good business communications*
4. *Acquaint with organizational communication requirements and presentations.*

SYLLABUS:

UNIT I : 06hrs

Introduction and Importance of communication an overview - meaning and process of communication - organizational communication and its barriers.

UNIT II: 10hrs

Types of Business Communications –Categories, methods and formats - Business vocabulary - Business idioms and collocations – Organisational Hierarchy - Various levels of communication in an organization – Top-down, Bottom-up and Horizontal-Business reports, presentations– Online communications.

UNIT III: 10hrs

Receiving business communications -Filing and processing -Sending replies. Routine cycle of communications – Writing Communications - Characteristics of a good business communication -Preparation of business meeting agenda – agenda notes - minutes –circulation of minutes – Presentations of communication using various methods.

Recommended Co-curricular Activities (04hrs):

1. Collection of various model business letters
2. Invited lecture/field level training by a local expert
3. Reading of various business reports and minutes and its analysis
4. Presentations of reports, charts etc.
5. Assignments, Group discussion, field visit etc.



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2020-21

**Skill Development Courses
Semester-II**

Revised CBCS w.e.f 2020-21
SKILL DEVELOPMENT COURSES
COMMERCE STREAM

ADVERTISING

Total 30 hrs (2hrs/wk) 02 credits & Maximum 50 Marks

Learning Outcomes:

After Successful completion of this course, the students are able to;

1. Understand the field of Advertising
2. Comprehend opportunities and challenges in Advertising sector
3. Prepare a primary advertising model
4. Understand applying of related skills
5. Examine the scope for making advertising a future career

Syllabus

UNIT I: 06hrs

Introduction of advertising concepts- functions - Types of advertising - Creative advertising messages - Factors determining opportunities of a product/service/Idea

UNIT II: 10 hrs

Role of advertising agencies and their responsibilities - scope of their work and functions -
- Ethical issues - Identifying target groups -Laws in advertising. Advertising Statutory
Bodies in India - Role of AAI (Advertising Agencies Association of India), ASCI
(Advertising Standard Council of India)

UNIT III: 10hrs

Types of advertising – Basic characteristics of a typical advertisement – Reaching target
groups - Local advertising – Feedback on impact of advertisement - Business promotion.

Recommended Co-curricular Activities (04 hrs):

1. Collection and segmentation of advertisements
2. Invited Lectures/skills training on local advertising basics and skills
3. Visit to local advertising agency
4. Model creation of advertisements in compliance with legal rules
5. Assignments, Group discussion, Quiz etc.

Reference books and Websites:

1. Bhatia, K. Tej - Advertising and Marketing in Rural India - Mc Millan India



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2020-21

Skill Development Courses

Semester-II

Revised CBCS w.e.f. 2020-21

SKILL DEVELOPMENT COURSES

COMMERCE STREAM

Syllabus of

LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Total 30 hrs (02h/wk), 02 Credits & Max 50 Marks

Learning Outcomes:

At the successful completion of the course, the student will able to;

1. Summarize relationship between marketing and Logistic Management
2. Understand the concepts of Supply Chain Management in connection with products.
3. Understanding various types of seller and suppliers
4. Evaluate best logistic method among all means of transport operations
5. Analysis of different distribution strategies - online and physical distribution
6. Compare the Logistics in National and International Scenario.
7. Design and develop new methods and models of Logistics in SCM

SYLLABUS:

Unit-I: Introduction to Logistics and Supply Chain Management (SCM):

Functions of Logistics - Structure of logistics - Logistics Costs - Modes of Logistics - Logistics in 21st Century -- Role of Supply Chain Management - Design and Development of Supply Chain Network - Different types of Supply Chain Networks

Unit-II: Logistics:

Customer Selection - Process -Customer Service and Customer Retention – Relationship Management - Integrating Logistics and Customer Relationship Management

Unit-III: Supply Chain Management:

Managing and Estimating Supply Chain Demand – Forecasting Techniques – Supplier Networks –Skills to Manage SCM - Recent Trends in SCM

Suggested Co-curricular Activities:

1. Invited lecture from Domain/Industry Experts
2. Field Visit (Manufacturing units, Suppliers)
3. Assignments, Seminars, Group Discussion, Quiz and Role Play
4. Poster presentations on SCM
5. Case Study Development



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2020-21

Skill Development Courses

Semester-II

B.A, B.Com & B.Sc. PROGRAMMES

Revised CBCS w.e.f. 2020-21

SKILL DEVELOPMENT COURSES

Science Stream

Syllabus of
SOLAR ENERGY

Total 30 hrs (02h/wk),

02 Credits & Max Marks: 50

Learning Outcomes:

After successful completion of the course, students will be able to:

1. Acquire knowledge on solar radiation principles with respect to solar energy estimation.
2. Get familiarized with various collecting techniques of solar energy and its storage
3. Learn the solar photovoltaic technology principles and different types of solar cells for energy conversion and different photovoltaic applications.
4. Understand the working principles of several solar appliances like Solar cookers, Solar hot water systems, Solar dryers, Solar Distillation, Solar greenhouses

SYLLABUS:

UNIT-I – Solar Radiation:

(6 hrs)

Sun as a source of energy, Solar radiation, Solar radiation at the Earth's surface, Measurement of Solar radiation-Pyroheliometer, Pyranometer, Sunshine recorder, Prediction of available solar radiation, Solar energy-Importance, Storage of solar energy, Solar pond

UNIT-II – Solar Thermal Systems:

(10 hrs)

Principle of conversion of solar radiation into heat, Collectors used for solar thermal conversion: Flat plate collectors and Concentrating collectors, Solar Thermal Power Plant, Solar cookers, Solar hot water systems, Solar dryers, Solar Distillation, Solar greenhouses.

UNIT-III – Solar Photovoltaic Systems:

(10 hrs)

Conversion of Solar energy into Electricity - Photovoltaic Effect, Solar photovoltaic cell and its working principle, Different types of Solar cells, Series and parallel connections, Photovoltaic applications: Battery chargers, domestic lighting, street lighting and water pumping

Co-curricular Activities (Hands on Exercises): (04 hrs)

[Any four of the following may be taken up]

1. Plot sun chart and locate the sun at your location for a given time of the day.
2. Analyse shadow effect on incident solar radiation and find out contributors.
3. Connect solar panels in series & parallel and measure voltage and current.
4. Measure intensity of solar radiation using Pyranometer and radiometers.
5. Construct a solar lantern using Solar PV panel (15W)
6. Assemble solar cooker
7. Designing and constructing photovoltaic system for a domestic house requiring 5kVA power
8. Assignments/Model Exam.



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2020-21

Skill Development Courses

Semester-II

B.A, B.Com & B.Sc. PROGRAMMES

Revised CBCS w.e.f. 2020-21

SKILL DEVELOPMENT COURSES

Science Stream

Syllabus of

FRUITS AND VEGETABLES PRESERVATION

Total 30 hrs (02h/wk),

02 Credits & Max Marks: 50

Learning Outcomes:

On successful completion of this course the students will be able to;

1. Identify various types of fruits and vegetables and explain their nutritive value.
2. Understand the fragile nature of fruits and vegetables and causes for their damage.
3. Explain various methods of preservation for fresh fruits and vegetables.
4. Get to know the value-added products made from fruits and vegetables.

Syllabus:

Unit – 1 : Introduction to fruits and vegetables

06 Hrs.

1. Fruits: Definition, elementary knowledge on types of fruits (fleshy and dry) with local /common examples.
2. Vegetables: Definition, elementary knowledge on types of vegetables (root, leafy, stem, flower and fruit) with local/ common examples.
3. Importance of fruits and vegetables in human nutrition.
4. Concept of perishable plant products – maturation and spoilage, shelf life; preservation – definition and need for preservation of fruits and vegetables.

Unit – 2 :Preservation of Fruit

09 Hrs.

1. Fruits – ripening and biological aging; storage and preservation concerns.
2. Preservation of fresh fruits at room temperature and in cold storage.
3. Fruit preservation at room temperature as juices, squashes and syrups.
4. Preservation of fruits by application of heat; making of fruit products (jams, jellies and fruit slices in processing factories).
5. Preservation by dehydration (Eg. banana chips), application of sugar (Eg. mango candy), application of salt (pickling).
6. Fruit preservation by freezing – storage at the lowest temperatures.

Unit – 3 :Preservation of vegetables

09 Hrs.

1. Vegetables – losses after harvesting and causes; problems in handling and storage.
2. Modern methods of packaging and storage to reduce losses.
3. Trimming of vegetables and packing in cartons; dehydration technique -factory processing.
4. Making of vegetable products (flakes/chips of potato and onion; garlic powder).
5. Frozen vegetables – Carrots, Cauliflower, Okra and Spinach.
6. Preservation of sliced vegetables in factories by canning and bottling.
- 7.

Suggested Co-curricular activities (6 Hrs.)

1. Assignments/Group discussion/Quiz/Model Exam.
2. Invited lecture and demonstration by local expert
3. Exhibition of various types of locally available fruits and vegetables.
4. Hands on training on handling and packaging methods of fresh fruits and vegetables.
5. Hands on training on making fruit juices.
6. Display of various preserved fruit products available in local markets.
7. Hands on training on making of potato, yam, onion chips.
8. Display of various preserved vegetable products available in local markets.
9. Watching videos on preservation of fruits and vegetables.
10. Visit to Horticulture University or research station to learn about value added products of fruits and vegetables.



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Skill Development Courses

Semester-II

B A, B Com & B Sc Programmes

Revised CBCS w.e.f. 2020-21

SKILL DEVELOPMENT COURSES

To be Offered from Semesters I to IV

ZOOLOGY STREAM

Syllabus of

DAIRY TECHNOLOGY

Total 30 hrs (02h/wk), 02 Credits & Max 50 Marks

Learning Outcomes:

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

1. Understand the pre-requisites for starting a Dairy farm
2. Recognize different breeds of Cows & buffaloes following safety precautions.
3. Prepare and give recommended feed and water for livestock
4. Maintain health of livestock along with productivity
5. Vaccination of cattle, nutrients requirements
6. Entrepreneurship i.e., Effectively market dairy products
7. Ensure safe and clean dairy farm and Standard safety measures to be taken in establishing an industry
8. Efficiently start and manage to establish or develop a Dairy Industry

SYLLABUS:

Section I (Introduction and Establishment of a Dairy Farm): 05 Hrs

- 1.1 Dairy development in India – Dairy Cooperatives (NDRI, NDDB, TCMPPF)(1hr)
- 1.2 Constraints of Present Dairy Farming and Future Scope of Dairy Farmer.(1 hr)
- 1.3 Selection of site for dairy farm; Systems of housing – Loose housing system, Conventional Dairy Farm; Records to be maintained in a dairy farm. (2 hrs)

Section II (Livestock Identification and Management): 13 Hrs

- 2.1 Breeds of Dairy Cattle and Buffaloes – Identification of Indian cattle and buffalo breeds and Exotic breeds; Methods of selection of Dairy animals. (5 hrs)
- 2.2 Systems of inbreeding and crossbreeding. (2 hrs)
- 2.3 Weaning of calf, Castration, Dehorning, Deworming and Vaccination programme (3 hrs)
- 2.4 Care and management of calf, heifer, milk animal, dry and pregnant animal, bulls and bullocks. (3 hrs)

Section III (Feed Management, Dairy Management, Cleaning and Sanitation): 8 Hrs

- 3.1 Basic Principles of Feed, Important Feed Ingredients, Feed formulation and Feed Mixing(2 hrs)
- 3.2 Operation Flood –Definition of Milk and Nutritive value of milk and ICMR recommendation of nutrients –Per Capita Milk production and availability in India and Andhra Pradesh -Methods of Collection and Storage of Milk–Labelling and Storage of milk products (4 hrs)
- 3.3 Cleaning and sanitation of dairy farm – Safety precautions to prevent accidents in an industry. (2 hrs)

Co-curricular Activities Suggested: (4 hrs)

1. Group discussion&SWOT analysis
2. Visit to a Dairy Farm
3. Visit to Milk Cooperative Societies
4. Visit to Feed Milling Plants
5. Market Study and Identification of Government Schemes, Insurance and Bank Loans in relation to dairy farming

Reference books:

1. Dairy Science: Petersen (W.E.) Publisher – Lippincott & Company
2. Principles and practices of Dairy Farm –Jagdish Prasad
3. Text book of Animal Husbandry - G C Benarjee
4. Hand book of Animal Husbandry - ICAR Edition
5. Outlines of Dairy Technology – Sukumar (De) – Oxford University press
6. Indian Dairy Products – Rangappa (K.S.) & Acharya (KT) – Asia Publishing House.
7. The technology of milk Processing – Ananthakrishnan, C.P., Khan, A.Q. and Padmanabhan, P.N. – Shri Lakshmi Publications.
8. Dairy India 2007, Sixth editon
9. Economics of Milk Production – Bharati Pratima Acharya Publishers.
10. <http://www.asci-india.com/BooksPDF/Dairy%20Farmer%20or%20Entrepreneur.pdf>
11. <https://labour.gov.in/industrial-safety-health>



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Skill Development Courses

Semester-II

B.A, B.Com & B.Sc. PROGRAMMES

Revised CBCS w.e.f. 2020-21

SKILL DEVELOPMENT COURSES

Science Stream

Syllabus of

FOOD ADULTERATION

Total 30 hrs (02h/wk),

02 Credits & Max Marks: 50

Learning Outcomes:

After successful completion of the course, students will be able to:

1. Get basic knowledge on various foods and about adulteration.
2. Understand the adulteration of common foods and their adverse impact on health
3. Comprehend certain skills of detecting adulteration of common foods.
4. Be able to extend their knowledge to other kinds of adulteration, detection and remedies.
5. Know the basic laws and procedures regarding food adulteration and consumer protection.

SYLLABUS:

UNIT-I – Common Foods and Adulteration: (07hrs)

Common Foods subjected to Adulteration - Adulteration – Definition – Types; Poisonous substances, Foreign matter, Cheap substitutes, Spoiled parts. Adulteration through Food Additives – Intentional and incidental. General Impact on Human Health.

UNIT-II –: Adulteration of Common Foods and Methods of Detection: (10hrs)

Means of Adulteration Methods of Detection Adulterants in the following Foods; Milk, Oil, Grain, Sugar, Spices and condiments, Processed food, Fruits and vegetables. Additives and Sweetening agents (at least three methods of detection for each food item).

UNIT-III –: Present Laws and Procedures on Adulteration: (08hrs)

Highlights of Food Safety and Standards Act 2006 (FSSA) – Food Safety and Standards Authority of India – Rules and Procedures of Local Authorities.
Role of voluntary agencies such as, Agmark, I.S.I. Quality control laboratories of companies, Private testing laboratories, Quality control laboratories of consumer co-operatives.
Consumer education, Consumer's problems, rights and responsibilities, COPRA 2019 - Offences and Penalties – Procedures to Complain – Compensation to Victims.

Recommended Co-curricular Activities (including Hands on Exercises): (05hrs)

1. Collection of information on adulteration of some common foods from local market
2. Demonstration of Adulteration detection methods for a minimum of 5 common foods (one method each)
3. Invited lecture/training by local expert



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Semester - III

Foundation Course -5

Information & Communication Technology-2

(Internet Fundamentals and Web Tools) (30 hrs. of Teaching Learning including Lab)

(Common for All UG Programs)

Unit-I: Fundamentals of Internet : Networking Concepts, Data Communication – Types of Networking, Internet and its Services, Internet Addressing – Internet Applications – Computer Viruses and its types – Browser – Types of Browsers.

Unit-II: Internet Applications: Using Internet Explorer, Standard Internet Explorer Buttons, Entering a Web Site Address, Searching the Internet – Introduction to Social Networking: Twitter, Tumblr, LinkedIn, Facebook, Flickr, Skype, Yelp, Vimeo, Yahoo!, Google+, Youtube, WhatsApp, etc.

Unit-III: E-Mail : Definition of E-mail - Advantages and Disadvantages – User IDs, Passwords, Email Addresses, Domain Names, Mailers, Message Components, Message Composition, Mail Management, Email Inner Workings.

Unit IV: WWW- Web Applications, Web Terminologies, Web Browsers, URL – Components of URL, Searching WWW – Search Engines and Examples.

Unit-V: Basic HTML: Basic HTML – Web Terminology – Structure of a HTML Document – HTML, Head and Body tags – Semantic and Syntactic Tags – HR, Heading, Font, Image and Anchor Tags – Different types of Lists using tags – Table Tags, Image formats – Creation of simple HTML Documents.

References:

1. Raymond Green Law and Ellen Hepp, Fundamentals of the Internet and the World Wide Web, TMH Publishers.



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Semester-III

Foundation Course - 6

Communication and Soft Skills-2 (Course Content (30 hours))
(Common for All UG Programs)

CSS-2 aims at improving the speaking skills of the learner. For many learners of English, the sound-spelling relationship of the language appears anarchic. Another problem many Indian learners face is English word accent. Unit I and Unit II help learners overcome these problems to a great extent. The remaining units are on the two productive skills, speaking and writing. The techniques of day-to-day conversations and the important characteristics of interviews and GDs presented in this course strengthen the learner's speaking skills. The last unit presents various aspects of presentation in writing.

Unit I: Pronunciation-1

The Sounds of English

Unit II: Pronunciation-2

1. Word Accent
2. Intonation

Unit III: Speaking Skills-1

1. Conversation Skills
2. Interview Skills
3. Presentation Skills
4. Public Speaking

Unit IV: Speaking Skills-2

1. Role Play
2. Debate
3. Group Discussion

Unit V: Writing Skills

1. Spelling
2. Punctuation
3. Information Transfer
 - o Tables
 - o Bar Diagrams
 - o Line Graphs
 - o Pie Diagrams
 - o Flow Charts
 - o Tree Diagrams
 - o Pictures



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Semester - IV
Foundation Course -7
Communication and Soft Skills-3 (Course Content (30 hours))
(Common for All UG Programs)

A current axiom is that hard skills will get a person an interview, but soft skills will get that person the job. Unit I of the course is on soft skills, which are absolutely necessary in the global job market. Writing is considered the most difficult of all the skills. Units II to V help the learner improve their writing skills, especially academic/formal writing.

Unit I: Soft Skills

1. Positive Attitude
2. Body Language
3. SWOT/SWOC Analysis
4. Emotional Intelligence
5. Netiquette

Unit II: Paragraph Writing

1. Paragraph Structure
2. Development of Ideas

Unit III: Paraphrasing and Summarizing

1. Elements of Effective Paraphrasing
2. Techniques for Paraphrasing
3. What Makes a Good Summary?
4. Stages of Summarizing

Unit IV: Letter Writing

1. Letter Writing (Formal and Informal)
2. E-correspondence

Unit V:

1. Resume and CV
2. Cover Letter



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2020-21

Semester-IV

Foundation Course - 8

Analytical Skills

(Common for All UG Programs) (Total 30 Hrs)

Unit-I : Data Analysis: The data given in a Table, Graph, Bar Diagram, Pie Chart, Venn diagram or a passage is to be analyzed and the questions pertaining to the data are to be answered.

Unit-II: Sequence and Series: Analogies of numbers and alphabets completion of blank spaces following the pattern in A:b::C: d relationship odd thing out; Missing number in a sequence or a series.

Unit-III: Arithmetic ability: Algebraic operations BODMAS, Fractions, Divisibility rules, LCM & GCD (HCF). Date, Time and Arrangement Problems: Calendar Problems, Clock Problems, Blood Relationship.

Unit-IV: Quantitative aptitude: Averages, Ration and proportion, Problems on ages, Time-distance – speed.

Unit-V: Business computations: Percentages, Profit & loss, Partnership, simple compound interest.

References:

1. R S Agrawal, Quantitative Aptitude for Competitive Examination, S.Chand publications.
2. R V Praveen, Quantitative Aptitude and Reasoning, PHI publishers.
3. Pratogitaprakasan, Kic X, Quantitative Aptitude: Numerical Ability (Fully Solved) Objective Questions, Kiran Prakasan publishers
4. Abhijit Guha, Quantitative Aptitude for Competitive Examination, TMG Hill publications.
5. Old question Paper of the Exams conducted by (Wipro, TCS, Infosys, etc.) at their recruitment process, source-Internet.

Note: The teachers/students are expected to teach /learn the contents by not converting them to the problems of algebra at the maximum possible extent, but to use analytical thinking to solve the exercises related to those topics. This is the main aim of the course.



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Semester-IV

Foundation Course-9
Entrepreneurship Education
(Common for All UG Programs)

(Total 30 Hrs)

Unit-I: Entrepreneurship: Entrepreneur characteristics – Classification of Entrepreneurships – Incorporation of Business – Forms of Business organizations –Role of Entrepreneurship in economic development –Start-ups.

Unit-II: Idea Generation and Opportunity Assessment: Ideas in Entrepreneurships – Sources of New Ideas – Techniques for generating ideas – Opportunity Recognition – Steps in tapping opportunities.

Unit-III: Project Formulation and Appraisal : Preparation of Project Report –Content; Guidelines for Report preparation – Project Appraisal techniques –economic – Steps Analysis; Financial Analysis; Market Analysis; Technical Feasibility.

Unit-iv: Institutions Supporting Small Business Enterprises: Central level Institutions: NABARD; SIDBI, NIC, KVIC; SIDIO; NSIC Ltd; etc. – state level Institutions –DICs- SFC- SSIDC- Other financial assistance.

Unit-V: Government Policy and Taxation Benefits: Government Policy for SSIs- tax Incentives and Concessions –Non-tax Concessions –Rehabilitation and Investment Allowances.

References:

1. Arya Kumar, Entrepreneurship, Pearson, Delhi, 2012.
2. Poornima M.CH., Entrepreneurship Development–Small Business Enterprises, Pearson, 2009
3. Michael H. Morris, et. al., Entrepreneurship and Innovation, Cengage Learning, New Delhi, 2011
4. Kanishka Bedi, Management and Entrepreneurship, Oxford University Press, Delhi, 2009
5. Anil Kumar, S., et.al., Entrepreneurship Development, New Age Publishers, New Delhi, 2011
6. Khanka, SS, Entrepreneurship Development, S. Chand, New Delhi.
7. Peter F. Drucker, Innovation and Entrepreneurship.
8. A.Sahay, M. S. Chikara, New Vistas of Entrepreneurship: Challenges and Opportunities.



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Semester-IV

Foundation Course-10
Leadership Education
(Common for All UG Programs) (Total 30 Hrs)

1. Organisation – Management – Leadership – Meaning and Significance – Different theories – Trait Theory, Blake & Mountan Theory – Other functions of Management.
2. Behavioral Concepts – Individual Behaviour – Perception – Learning – Attitude Formation and Change – Motivation – Theories of Motivation – Personality Development.
3. Interpersonal Behaviour – Communication – Leadership – Influencing Relations – Transactional Analysis.
4. Group Dynamics – Roles – Morale – Conflict – Groups – Inter-Group Behaviour – Inter-Group Collaboration and Conflict Management.
5. Team Building and Management – Developing team resources – Designing team – Participation and Repercussion – Team building activities.

References:

1. Fred Luthans, "Organizational Behaviour", Tata McGraw Hill Publishing Co., New Delhi.
2. Robins, Stephen P, "Organizational Behaviour", Prentice Hall of India, New Delhi.
3. Koontz and O "Donnell", Essentials of Management, TMH Publishing Co., New Delhi.
4. Keith Davis, "Human Behaviour at Work", Tata McGraw Hill Publishing Co., New Delhi.
5. Aswathappa, "Orgnizational Behaviour", Himalaya Publishing House, Mumbai
6. Stoner Freeman, "Management", Prentice Hall of India, New Delhi.



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2020-21

Core papers

Advance Urdu

PAPER – 1

URDU PROSE

Afsanavi Adab aur Drama

UNIT – I	Novel	Taaruf aur Irteqa
UNIT – II	Novel 'Nirmala' by Premchand	
UNIT – III	Afsana	Taaruf aur Irteqa
UNIT – IV	Urdu Afsane edited by Raziya Sajjad Zaheer. The following four short stories only:	
	1. 'Woh' by Balraj Menra	
	2. 'Computer Ishq' by Joginder Pal	
	3. 'Lal aur Peela' by K.A.Abbas	
	4. 'Mom ki Mariyam' by Jeelani Banu	
UNIT – V	Drama 'Darwaze Khol Do' by Krishan Chander	

SUGGESTED READING:

FANNE AFSANA NIGARI – WAQAR AZEEM
BEESWIN SADI MEIN URDU NOVEL – YOUSUF SARMAST
URDU DRAMA – ISHRAT RAHMANI



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Core papers

Advance Urdu

Core Course Under CBCS

PAPER – II

URDU PROSE

Ghair Afsanavi Adab

UNIT – I SAFARNAMA
'Bullet Train mein kabhi na baitho'
by Mujtaba Hussain

UNIT – II KHAKA – Taaruf aur Irteqa

UNIT – III Khaka – *'Dr. Abdul Haq Marhoom'*
by Rasheed Ahmed Siddiqui.

UNIT – IV INSHAIYA - Taaruf aur Irteqa

UNIT – V Inshaiya – *'Jheengar ka Janaza'*
by Khwaja Hasan Nizami

SUGGESTED READING:

URDU MEIN KHAKA NIGARI – SABIRA SAYEED
URDU SAFARNAMOUN KA TANQEEDI MUTALA – KHALID MAHMOOD
INSHAIYA AUR INSHAIYE – SYED MOHAMMED HASNAIN



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Core papers

Advance Urdu

Syllabus for II B.A. Part – II Urdu

SEMESTER - III

Second year Optional Urdu Paper - III

URDU POETRY

Prescribed book : Gowhare Adab by A.P.Urdu Academy

- UNIT – I **MASNAVI – A portion of Gulzar-e-Naseem**
‘Aana tajul mulook ka sehrae tilism se’
- UNIT – II **GHAZAL – The following Ghazals only:**
1. ‘Bas ke dushwar hai har kaam’ by Ghalib
2. ‘Woh adae dilbari ho ke nawae’ by Jigar
3. ‘Jala ke mashale jan hum’ by Majrooh
- UNIT – III **NAZM**
1. ‘Roohe arzi aadam ka isteqbal karti hai’
By Allama Iqbal
2. ‘Sagar ke kinare’ by Maqdoom
- UNIT – IV **Ghazalgo shora ki sawaneh**
1. Ghalib 2. Jigar 3. Majrooh
- UNIT – V **Nazmgo shora ki sawaneh**
1. Allama Iqbal 2. Maqdoom



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2020-21

Core papers

Advance Urdu

Syllabus for II B.A. Part – II Urdu

SEMESTER - IV

Second year Optional Urdu Paper - IV

URDU POETRY

Prescribed book : Gowhare Adab by A.P.Urdu Academy

- UNIT – I QASEEDA – Ta'aruf
- UNIT – II QASEEDA – Mohsin Kakori (Selected portion)
'Simte kashi se chala janibe mathura badal'
- UNIT – III MARSIIYA – Ta'aruf
- UNIT – IV MARSIIYA – Meer Anees (Selected portion)
'Namake khwane takallum hai fasahat meri'
- UNIT – V Biography of following poets:
1. Mohsin Kakori 2. Meer Anees



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Core papers

Advance Urdu

Semester-V Paper-V

UNIT – I

1-Urdu Zuban Ka Agaz-O-Irtakha:

1-1 MiktalifNazriyat-ShokatThanayi-

1-2 Mahamood Khan Shirani

UNIT– II.

2- DakniDouar-Ke-Ousiyat-Mahammad Quli Qutub Sha

2-1 Mulawajahi

2-2 Nusrathi

UNIT – III

3- DabistanaDilhi--Ke-Ousiyat-

3-1 Dard

3-2 Zaqak

UNIT – IV

4-DabistanaLaknow–Ke-Ousiyat-

4-1 Attish

4-2 Nasiq

UNIT –V

5- SirSayedTaharikKe-Ousiyat-

5-1 RumaniTaharik

5-2 TarakhiPasandTaharik

Prescribed book- TariqeAdabe Urdu by Noorulhasn Naqvi



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SKR & SKR GOVT. COLLEGE FOR WOMEN (A), KADAPA

Semester – V (CBCS Special Urdu for BA)

Paper – VI : Tanqeed aur Balaghat

No. of Hours/week: 05 credits-4

UNIT – I

- 1- Urdu Tanqeed- Agaz-O-Irtakha
- 1-1 Taztirati Tanqeed
- 1-2 Shari maa Tanqeedi Naqhas

UNIT – II

- 2- Altaf Hussain Hali- Tanqeed
- 2-1 Makhadama Shair-O-Shariri-Ahamiath
- 2-2 Allama Shibli Nomaniky Tasneef Shair-ul-Ajaz-Ahamiath

UNIT – III

- 3- Thakhak-O-Tanqeed ka Bahami Rishta
- 3-1 Takleek-O-Tanqeed
- 3-2 Nakhad ka Faravaz

UNIT – IV

- 4- Tanqeed ka Mukhtalif Rumaniki Tankhidki Khusisivath
- 4-1 Tasorati Tanqeedki Khusisivath
- 4-2 Markasi Tanqeedki Khusisivatha

UNIT – V

- 5- Aham Tanqeed Nigar-Syed Ehtasham Hussin
- 5-1 Mahammad Hussin Ajad
- 5-2 Firak Gorakhpuri

List of reference books :

- 1- Fann Tanqeed aur tanqeed Nigari By Noorul Hasan Naqvi
- 2- Makhadama Shair-o-Shari
- 3- Shair-A1-Ajjam



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Core papers

Advance Urdu



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Semester – VI (CBCS Common to BA/BSc/B.com)

Paper – VII: Urdu Shari-KhadeemAsnat

No.ofHours/week : 5credits4

UNIT-I

- 1- Masnavi: Agaz-o-Artakha
- 1-1 Masnavi: AjazaTakibi
- 1-2 Masnavi: Khusisivath

UNIT-II

- 2- Qasida: Agaz-o-Artakha
- 2-1 Qasida: AjazaTakibi
- 2-2 Qasida: Khusisivath

UNIT-III

- 3- Marsiya: Agaz-o-Artakha
- 3-1 Marsiya: AjazaTakibi
- 3-2 Marsiya: Khusisivath

UNIT-IV

- 4- Rubayi: Agaz-o-Artakha
- 4-1 Rubayi: AjazaTakibi
- 4-2 Rubayi: Khusisivath

UNIT-V

- 5. Shorakisavani: Meer Hussain
- 5-1 Soda
- 5-2 Dabir
- 5-3 AkbarAlhabadi

Reference Books :



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Core papers

Advance Urdu

Paper – VIII(AI): Afsanavi Adab

No. of Hours/week:05

Credits:4

UNIT-I

1. Dastan: Agaz-o-Irtakha
- 1.1 Dastan: Ajza Tarkibi
- 1.2 Dastan: Kusisyath

UNIT-II

2. Drama: Agaz-o-Irtakha
- 2.1 Drama: Ajza Tarkibi
- 2.2 Drama: Kusisyath

UNIT-III

3. Novel: Agaz-o-Irtakha
- 3.1 Novel: Ajza Tarkibi
- 3.2 Novel: Kusisyath

UNIT-IV

4. Afsana: Agaz-o-Irtakha
- 4.1 Afsana: Ajza Tarkibi
- 4.2 Afsana: Kusisyath

UNIT-V

5. Aham Afsanavi Addib: Meer Aman
- 5.1 Intaiz Ali Taj
- 5.2 Deputy Nazeer Ahamad

Reference Books:



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Core papers

Advance Urdu



SKR & SKR GOVT. COLLEGE FOR WOMEN (A), KADAPA
Semester – VI (CBCS With Maths Combination Common to BA/BSc)

Paper – VIII(A2) : **Gair Afsanavi Adab**

No. of Hours/week: 05

Credits: 4

UNIT-I

1. Savani Nigari : Agaz-o-Irtakha
- 1.2 Savani Nigari : Khusisiyath
- 1.3 Savani Nigar : Altaf Hussainki Savani Nigari

UNIT-II

2. Khutut Nigari : Agaz-o-Irtakha
- 2.2 Khutut Nigari : Khusisiyath
- 2.3 Khutut Nigar : Galibki Khutut Nigari

UNIT-III

3. Khaka Nigari : Agaz-o-Irtakha
- 3.2 Khaka Nigari : Khusisiyath
- 3.3 Khaka Nigar : Rashid Ahamadki Khaka Nigari

UNIT-IV

4. Mazmoon Nigari : Agaz-o-Irtakha
- 4.2 Mazmoon Nigari : Khusisiyath
- 4.3 Mazmoon Nigar : Sir Syed Ahamadki Mazmoon Nigari

UNIT-V

5. Safar Nama : Agaz-o-Irtakha
- 5.2 Safar Nama : Khusisiyath
- 5.3 Safar Nama Nigar : Yusuf Nazim ki Safar Nama nigari
(Safar Nama “ Kolambas ka Dash Maa”)

Books Recommended:



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2020-21

Core papers

Advance Urdu



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Semester – VI (CBCS With Special Urdu Combination Common BA)

Paper – VIII(A3) : Special study of Moulana Abu KalaamAzad

No. of Hours/week:05Credits:4

UNIT-I BACH'PAN

UNIT-II SAHAFATH

UNIT-III CONGRESS KI SADARATH

UNIT-IV VIZ'ZARATH

UNIT-V TAS'SANIF

Prescribed book: Moulana Azad ki Kahani by Zaffar Ahamed Nizami



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2020-21

Core papers

Political Science

SYLLABUS

B.A. POLITICAL SCIENCE

FIRST YEAR

FIRST SEMESTER

(Under CBCS w.e.f. 2020-21)

Course-1: INTRODUCTION TO POLITICAL SCIENCE

Learning Outcomes:

On successful completion of the course the students will be able to;

- Recall the previous knowledge about Political Science and understand the nature and scope, traditional and modern approaches of Political Science.
- Understand concepts intrinsic to the study of Political Science.
- Have solid theoretical understanding of Rights and its theories along with the basic aspects of certain political ideologies.
- Apply the knowledge to observe the field level phenomena

UNIT-I :	INTRODUCTION
	1. Definition, Nature, Scope and Importance of Political Science – Relations with allied disciplines (History, Economics, Philosophy and Sociology)
	2. Approaches to the study of Political Science: Traditional Approaches-Philosophical, Historical. Modern Approaches-BehavioralandSystem Approach.

UNIT-II :	STATE
	1. Definition of the State, Elements of the State, Theories of Origin of the State-(Divine Origin, Force, Evolutionary and Social Contract).
	2. Concepts of Modern State and Welfare State.

UNIT-III :	CONCEPTS OF POLITICAL SCIENCE
	1. Law, Liberty, Equality.
	2. Power, Authority and Legitimacy.

UNIT-IV :	THEORIES OF RIGHTS
	1. Meaning, Nature and Classification of Rights
	2. Theories of Rights.

UNIT-V :	POLITICAL IDEOLOGIES
	1. Liberalism, Individualism, Anarchism.
	2. Socialism, Marxism and Multiculturalism.



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2020-21

Core papers

Political Science

B.A. POLITICAL SCIENCE

FIRST YEAR

SECOND SEMESTER

(Under CBCS w.e.f 2020-21)

Course-2: BASIC ORGANS OF THE GOVERNMENT

Learning Outcomes:

On successful completion of the course the students will be able to:

- Understand the Origin and Evolution of the concept of Constitutionalism and classification of Constitutions.
- Acquaint themselves with different theories of origin of State.
- Understand and analyses organs and forms of Governments along with a deep insight into the various agents involved in the political process.
- Apply the knowledge to analyse and evaluate the existing systems

UNIT-I :	CONSTITUTION
	1. Meaning, Definition, Origin and Evolution of Constitution.
	2. Classification of the Constitutions-Written and Unwritten; Rigid and Flexible.

UNIT-II :	ORGANS OF THE GOVERNMENT
	1. Theory of Separation of Powers-B.D.Montesquieu.
	2. Legislature-Unicameral and Bicameral-Power and Functions, Executive-Types,Powers and Functions. Judiciary-Powers and Functions.

UNIT-III :	FORMS OF GOVERNMENT
	1. Unitary and Federal forms of Governments-Merits and Demerits.
	2. Parliamentary and Presidential forms of Governments- Merits and Demerits.

UNIT-IV :	DEMOCRACY
	1. Meaning, Definition, Significance, Theories and Principles of Democracy.
	2. Types of Democracy: Direct and Indirect Democracy-Methods, Merits and Demerits-Essential Conditions for Success of Democracy.

UNIT-V :	POLITICAL PARTIES, PRESSURE GROUPS AND PUBLIC OPINION
	1. Meaning, Definition and Classification of Political Parties: National and Regional-Functions of Political Parties.
	2. Pressure Groups (Interest Groups)- Meaning, Definition, Types, Functions and Significance of Public Opinion.



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2020-21

Core papers

Political Science

Semester -III

SECOND YEAR; SEMESTER – III
B.A. POLITICAL SCIENCE
PAPER-III: INDIAN CONSTITUTION

Unit-1: The Making of the Constitution

1. The ideological legacy of the Indian National Movement on the Constituent Assembly
2. The Nature and Composition of the Constituent Assembly

Unit-2: Philosophical Premises of the Indian Constitution

1. Preamble: The underlying values of the Indian Constitution
2. Salient features of the Constitution of India

Unit-3: Fundamental rights and Directive principles of State Policy

1. Individual and Collective Rights: Limitations on the fundamental Rights
2. Judicial Interpretation of Fundamental Rights
3. The doctrine of 'Basic Structure' of the Constitution: KesavanandaBharathi Case

Unit-4: Indian Federalism

1. Unitary and Federal features in the Indian Constitution
2. Tension Areas between the Union and State Governments
Legislative, Administrative and Financial Spheres

Unit-5: Working of the Indian Constitution

1. The Values of the Indian Constitution and Ushering of Social Revolution in India

2. The causes for the Ascendency of the Executive over legislature and Judiciary; Major Controversies regarding the Amendments to the Constitution
3. Nature and Role of Higher Judiciary in India; Recent Debates on the mode of appointment of Judges

Reference books:

1. Granville Austin (1972) the Indian Constitution, Cornerstone of a Nation Oxford university Press, New Delhi.
2. Madhavkhosla (2012) the Indian Constitution, oxford university press, New Delhi
3. Granville Austin (1999) Working a Democratic Constitution; A History of the Indian Experience, Oxford University Press, New Delhi
4. Zoya Hasan, Sridharan E and Sudharshan R (Eds) 2002 India's living Constitution, Permanent black, New Delhi
5. BaxiUendra (1980) the Indian Supreme Court and Politics Eastern book co, Lucknow



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2020-21

Core papers

Political Science

SECOND YEAR; SEMESTER – IV
B.A. POLITICAL SCIENCE
PAPER-IV : INDIAN POLITICAL PROCESS

Unit-1: Approaches to Study the Political Processes in India

1. Theory of Modernization: Transition from Tradition to Modernity
2. Marxian Approach: Transition from pre-capitalism to capitalism

Unit-2: Social Structure and Democratic Process

1. Transition of Caste System: From Hierarchy to Identity: Role of Agency
2. Politicisation of Intermediate and Dalit Caste Communities
3. Evolution of Modernity in India

Unit-3: Religion and Politics

1. Competing Communalisms: Majoritarian and Minoritarian
2. Debates on Secularism; Role of the State towards religion

Unit-4: Party and Electoral Processes in India

1. Electoral Trends of the Lok Sabha from 1952 to 2014: From the One Party Congress System to Multi Party Coalitions
2. Determinants of Voting Behavior in India: Caste, Class, Patronage, Money etc.

3. Evolution of Party System in India: the Ideology and Social bases of major Political Parties: INC, BJP, CPM, DMK, BSP, TDP

Reference books:

1. Chandhoke N and Priyadarshini P (Eds) (2009) Contemporary India Economy, society, politics, Pearson, NewDelhi.
2. Vanaik A and Bhargava R (Eds) (2010) Understanding Contemporary India Critical perspectives orient black swan New Delhi.
3. Jayal N G and Mehta PB (Eds) (2010) Oxford Companion to Indian Politics Oxford University Press, New Delhi.
4. Kohliatul and Prema Singh (Ed) (2013) Routledge Hand book of Indian Politics Routledge, New York.
5. Jaffrelot C (2003) India's Silent Revolution: The Rise of the Lower Caste in North India, C Hrust, London.
6. Stanely A. Kochanek, Robert L. Hardgrave, India Government and Politics in a Developing Nation, Boston, Wards Worth Publishing, 2006.
7. Rajeev Bhargava (Ed) Secularism and its Critics (1998), Delhi, OUP.

	Problems of Defections.
--	-------------------------

UNIT-III :	GROSSROOT DEMOCRACY-DECENTRALISATION
	1. Panchayat Raj system-Local and Urban Governments-Structure, Powers and Functions.
	2. Democratic Decentralization-Rural Development and Poverty alleviation with reference to 73 rd and 74 th Constitutional Amendment Acts, Challenges and Prospects.

UNIT-IV :	SOCIAL DYNAMICS AND EMERGING CHALLENGES TO INDIAN POLITICAL SYSTEM
	1. Role of Caste, Religion, Language and Regionalism in India.
	2. Politics of Reservation, Criminalization of Politics and Internal threats to Security.

UNIT-V :	REGULATORY AND GOVERNANCE INSTITUTIONS
	1. NITI Ayog, Finance Commission, Comptroller and Auditor General of India.
	2. Central Vigilance Commission, Central Information Commission, Lokpal and Lokayukta.



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2020-21

Core papers

Political Science



THIRD YEAR; SEMESTER – V
B.A. POLITICAL SCIENCE
PAPER-V: INDIAN POLITICAL THOUGHT

Unit-1: Traditions of Ancient Indian Political Thought

1. Sources and features of Ancient Indian Political Thought
2. Manu: Social laws
3. Kautilya: Theory of the State

Unit-2: Renaissance Thought

1. Rammohun Roy: Religious and Social Reform
2. Pandita Ramabai: Gender

Unit-3: Early Nationalism

1. Dadabai Naoroji: Drain Theory and Poverty
2. Ranade M G: The Role of the State and Religious Reform

Unit-4: Religious Nationalism

1. Savarkar V D: Hindutva or Hindu Cultural Nationalism
2. Mohammed Iqbal: Islamic Communitarian Nationalism

Unit-5: Democratic Egalitarianism

1. Gandhi-Swaraj and Satyagraha
2. Jawaharlal Nehru- Democratic Socialism
3. Dr. Ambedkar B R – Annihilation of Caste System
4. M.N.Roy: Radical Humanism

Reference books:

1. Pantham Thomas and Kenneth Deutsch(Ed)(1986)
Political thought in modern India, Sage, New Delhi
2. Bidyut Chakrabarty and Rajendra Kumar Pandey (2009) modern Indian political thought, Sage, New Delhi
3. Gurpreet Mahajan (2013), India : Political ideas and making of a democratic discourse, zed book, London
4. Partha Chatterjee (1986) nationalist thought and the colonial world: A derivative disclosure, zed books, London
5. Bhikhu Parekh (1999) colonialism, tradition and reform, Sage, New Delhi
6. Bhikhu Parekh(1989) Gandhi's political philosophy ,Macmillan, London



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Core papers

Political Science

THIRD YEAR; SEMESTER – V
B.A. POLITICAL SCIENCE
PAPER-VI: WESTERN POLITICAL THOUGHT

Unit-1: Classical Western Political Thought

1. Plato: Theory of Forms, Critique of Democracy, Justice
2. Aristotle: Citizenship, State, Justice, Virtue

Unit-2: Early Medieval to the Beginning of Modern Thought

1. St. Augustine: Earthly City and Heavenly City, Evil, Freewill, Moral Action
2. Machiavelli, Statecraft, Virtue, Fortuna

Unit-3: Liberal Thought

1. Thomas Hobbes: Human nature, Social Contract, liberty, State
2. John Locke: Natural Rights, Consent, Social Contract, State
3. Rousseau: Social institutions and Moral Man, Equality, liberty and General Will

Unit-4: Liberal Democratic Thought

1. Jeremy Bentham: Utilitarianism
2. John Stuart Mill: Individual liberty, Representative Government

Unit-5: Philosophical Idealism and its critique

1. Hegel: Individual Freedom, Civil Society, State
2. Karl Marx: Alienation, Surplus Value, Materialist Conception of History, State

Reference books

1. Shefali Jha (2010) Western Political Thought from Plato to Karl Marx, Pearson, New Delhi
2. Boucher D and Kelly P (Eds) (2009) Political Thinkers from Socrates to the Present, Oxford University press, oxford
3. Coleman J (2000) A History of Modern Political Thought: From Ancient Greece to early Christianity, Blackwell publishers, oxford
4. Macpherson C B (1962) The Political Theory of Possessiveness Individualism, Oxford University press, oxford
5. Hampshire-monk I (2001) A History of Modern Political Thought: Major Political Thinkers from Hobbes to Marx Blackwell publishers, oxford



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Core papers

Political Science

THIRD YEAR; SEMESTER –VI
B.A. POLITICAL SCIENCE

PAPER-VII : PRINCIPLES OF PUBLIC ADMINISTRATION

Unit-1: Nature of Public Administration

1. Meaning, Nature and Scope of Public Administration
2. Significance of Public Administration
3. Public and Private Administration

Unit-2: Administrative Theories

1. Classical Theory-Henry Fayol
2. Human Relations theory-Elton Mayo
3. Rational Decision making theory-Herbert Simon

Unit-3: Principles of Organization

1. Hierarchy- Span of control-Unity of command
2. Decision Making-Communication
3. Co-ordination-leadership

Unit-4: Structure of organization

1. Chief Executive-Types and Functions
2. Department-Bases of Departmentalization
3. Line and Staff Agencies

Unit-5: Theories of Motivation

1. Meaning and importance of Motivation
2. Hierarchy of needs theory; Abraham Maslow
3. Theories of X and Y : Douglas Mc Gregor

Reference books:

1. Pardhasaradhi (Eds) (2011) Public Administration; Concepts, Theories and Principles, Telugu Academy, Hyderabad
2. R.kSapru (2014) 3rd Edition, Administrative Theories and Management Thought, PHI learning Pvt Ltd, New Delhi.
3. Prasad D R, Prasad V S.(Eds) (2010),Administrative Thinkers, Sterling Publishers, NewDelhi.



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2020-21

Core papers

Political Science

THIRD YEAR; SEMESTER – VI
B.A. POLITICAL SCIENCE

(Cluster Elective)

PAPER: VIII-A1: INTERNATIONAL RELATIONS

Unit- I: Basic Concepts of International Relations

1. Meaning, Nature and Scope of International Relations
2. (a). Balance of power (b). National interests
(c). Collective Security (d). Diplomacy

Unit-II: Approaches to the study of International Relations

1. Idealism – Woodrow Wilson
2. Classical Realism – Hans Morgenthau
3. Neo – realism – Kenneth Waltz

Unit-III: Phases of International Relations (1914-1945)

1. Causes for the First World War
2. Causes for the Second World War

Unit-IV: Phases of International Relations (1945 onwards)

1. Origins of First Cold War
2. Rise and Fall of Détente
3. Origins and the End of Second Cold War

Unit-V: International Organisation

1. The role of UNO in the protection of International Peace
2. Problems of the Third World: Struggle for New International Economic Order

Reference Books:

1. Jackson, R and Sorensan Y, Introduction to International Relations; Theories and approaches, New York, OUP, 2008.
2. Baylis, J and Smith, S (Eds), The Globalization of World Politics; An Introduction to International Relations, Oxford, OUP, 2011
3. Aneek Chatterjee, International Relations Today; Concepts and Applications, New Delhi, Pearson Education, 2008.
4. E.H. Carr. International relations between the two world Wars, Lodon, Palgrave Macmillan, 2004.



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Core papers

Political Science

THIRD YEAR; SEMESTER –VI

B.A. POLITICAL SCIENCE

PAPER: VIII-A2: INDIAN FOREIGN POLICY

Unit- I: Evolution of Indian Foreign of Policy

1. Determinants of Indian Foreign of Policy
2. Continuity and change in Indian Foreign Policy

Unit-II: Non-Alignment and UNO

1. The role of India in the Non-Alignment Movement
2. Relevance of Non-Aligned Movement in the Contemporary World
3. Role of India in the UNO in protection of International Peace

Unit-III: India's Relation with USA and China

1. Indo- US Relations: Pre- Cold War Era, Post- Cold War Era
2. India – China Relations: Pre- Cold War Era, Post- Cold War Era

Unit-IV: India and her Neighbours

1. Indo- Pakistan Relations
2. India's role in South Asian Association of Regions Cooperation (SAARC)

Reference Books:

1. David Scott (Ed), Handbook of India's International Relations, London, Routledge,2011
2. Ganguly, S (Ed), India as an Emerging Power Portland, Franck class, 2003
3. Pant, H, Contemporary Debates in Indian Foreign and Security Policy, London, Palgrave Macmillian,2008
4. Tellis, A and Mirski, S (Eds), Crux of Asia; China, India, and the Emerging global Order, Washington, Carnegie endowment for international peace,2013
5. Muni, S.D, India's Foreign Policy Delhi CUP, 2009
6. Alyssa Ayres and Raja Mohan, C (Eds), Power Realignment in Asia: China, India and the United States, New Delhi, Sage, 2002.
7. Appadorai, A, Domestic roots of Indian Foreign Policy, New Delhi, OUP,1971 Dutt, V.P, India's Foreign Policy in a Changing World, New Delhi, NBT,2011



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2020-21

Core papers

Political Science

THIRD YEAR; SEMESTER – VI
B.A. POLITICAL SCIENCE

PAPER: VIII-A3 : CONTEMPORARY GLOBAL ISSUES

Unit- I: Conceptions of Globalization

1. Economic Conception of Globalization
2. Political Conception of Globalization

Unit-II: Anchors of Global Political Economy

1. International Monetary Fund – Nature, Role and Functions
2. World Bank-Nature, Role and Functions
3. World Trade Organization: Origin, Nature and role in the context of Globalization

Unit-III: Nation State and Globalization

1. The role of Nation State in the context of Globalization
2. Consequences of Globalization – Rise of Inequalities within and across Nations

Unit-IV: Contemporary Global issues

1. Ecological Issues: International Agreements On Climate Change
2. International Terrorism: Non- State Actors and State Terrorism

Reference Books:

1. Ritzer, G., Globalization: A Basic Text, Sussex: Wiley- Black well,2009
2. Steger, M., Globalization: A Very Short Introduction, Oxford, OUP,2013
3. Heywood, A., Global Politics, New York, Palgrave Macmillian,2011
4. Held, D et.al, Global Transformations; Politics, Economics and culture California, Stanford University Press,1999
5. J. Volger. 'Environmental Issues' in J. Baylis, S. Smith an owens, P(Eds) Globalization of world politics, New York, Palgrave,2011



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2020-21

Core papers

Economics

SEMESTER – I :: COURSE - I
MICRO ECONOMIC ANALYSIS

Module-1: Economic Analysis and Methodology

Scarcity and Choice as fundamental problems of economics - Production Possibilities Curve - Micro and Macro Analysis - Micro economic analysis – Scope and Importance – inductive and deductive methods- Principles of Microeconomics : Allocation of Resources - Optimization, Equilibrium and Marginal analysis -Rationality Principle the concept of Welfare.

Module -2: Theory of Consumption

Concept of Demand -Factors determining demand - Law of Demand - reasons and exceptions - Elasticity of Demand -Cardinal and Ordinal utility - Indifference Curve analysis : Properties of Indifference curves, Indifference Curve Map -Marginal Rate of Substitution - Budget Line - Changes -Consumer Equilibrium under Indifference Curve Analysis – Consumers' Surplus.

Module -3: Theory of Production

Concept and Objectives of Firm - Production Function: Cobb- Douglas Production Function -Law of Variable Proportions -Laws of Returns to Scale - Economies of large scale - Concepts of Cost - Total, Average and Marginal Costs - Law of Supply - Concept of Revenue : Total, Average and Marginal Revenues - Relation between Average and Marginal Revenues and elasticity of Supply

Module-4: Theory of Exchange

Concepts of Market: Criteria for Classification of Markets - Perfect Competition– Conditions, Price and Output determination ; Monopoly : Conditions, Price and Output Determination - Price Discrimination; Monopolistic Competition - Assumptions - Price and output determination - Selling Costs ; Oligopoly -Types- Kinky demand curve and Price rigidity.

Module - 5:

Theory of Distribution The concepts of Functional and Personal Distribution of Income - Marginal Productivity Theory of Distribution - Modern Theory of Distribution -Concept of Rent - Ricardian Theory of Rent – Marshall’s concepts of Economic Rent and Quasi Rent; Theories of Wage Determination: Subsistence Theory and Standard of Living Theory - Modern Theory of Wages; Classical Theory of Interest -Loanable Funds Theory of Interest -Liquidity Preference Theory of Interest; Theories of Profit: Risk and Uncertainty, Dynamic and Innovations Theories



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Core papers

Economics

SEMESTER – 2:: COURSE –2

MACROECONOMIC ANALYSIS

Module - 1: National Income

Macroeconomics - Definition, Scope and Importance - Difference between Micro economic and Macro economic Analyses – Circular Flow of Income -National Income: Definitions, Concepts, Measurement of National Income - Difficulties - Importance - Concept of Green Accounting

Module -2: Theory of Employment

Classical Theory of Employment - Say's Law of Markets - Criticism -Keynesian Theory of Employment - Applicability to Developing countries- Consumption Function - Keynes' Psychological Law of Consumption - Average and Marginal Propensity to Consume - Factors determining Consumption Function - Brief Review of Relative, Life Cycle and Permanent Income Hypotheses- Investment Function: Marginal Efficiency of Capital -Multiplier and Accelerator.

Module – 3: Money and Banking

Definitions of Money - Concepts of Money, Liquidity and Finance - Money Illusion - Gresham's Law - RBI classification of Money - Theories of Money: Fisher and Cambridge (Marshall, Pigou, Robertson and Keynes equations) - Banking - Definition and types of Banking - Commercial Banks - Functions -Recent Trends in Banking - Mergers and Acquisitions - Central Bank - Functions - Control of Credit by Central Bank - NBFCs- Factors contributing to their Growth and their Role

Module – 4: Inflation and Trade Cycles

Inflation: Concepts of Inflation, deflation, reflation and stagflation - Phillip's Curve - Measurement of Inflation - CPI and WPI -Types of Inflation - Causes and Consequences of Inflation -Measures to Control Inflation. Trade Cycles: Phases of a Trade Cycle -Causes and Measures to control Trade Cycles

Module -5: Finance and Insurance

Financial Assets and Financial Instruments - Financial Markets - Functions of Money Market - Functions of Capital Market - Stock Market - Exchanges – Indices: Sensex and Nifty - Concept of Insurance -Types and Importance of Insurance.

Reference Books:

1. Dillard. D., *The Economics of John Maynard Keynes*, Cross by Lockwood and sons, London
2. M. C. Vaish - *Macroeconomic Theory*, Vikas Publishing House, New Delhi.
3. S. B Guptha - *Monetary Economics*, S. Chand & Co, Delhi
4. P. N. Chopra, *Macroeconomics*, Kalyani Publishers, Ludhiana, 2014
5. D. M. Mithani, *Macro Economic Analysis and Policy*, Oxford and IBH,



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Core papers

Economics

B. A. ECONOMICS

II Year B. A. Programme (UG) Courses – Under CBCS

Semester – III

Paper – III (Core Paper)

Macro Economics - National Income, Employment and Money

Module - 1

Meaning, definition of Macro Economics - Importance of Macro Economics- Difference between Micro and Macro Economics - Paradox of Macro Economics -Limitations

Module - 2

National Income - Definitions, Concepts of National Income - Measurement of National Income- Circular flow of Income in Two, Three and Four Sector Economy.

Module - 3

Classical theory of Employment - Say's Law of Markets.

Module - 4

Keynesian Theory of Employment - Consumption function – Investment Function - Marginal Efficiency of Capital (MEC)- Concepts of multiplier and accelerator

Module - 5

Meaning and Functions of Money - Classification of money - Gresham's Law - RBI classification of Money. Theories of Money - Fisher's Quantity theory of Money Cambridge approach (Marshall, Pigou, Robertson & Keynes).

▲ **REFERENCES:**

1. G.Ackley - "Macro Economics Theory and Policy", Collier Macmillan, 1978.
2. E.Shapiro - "Macro Economic Analysis", Galgotia Publications, 1999.
3. Central Statistical Organisations - "National Accounts Statistics".
4. R.Dornbush, s.Fisher and R.Startz - "Macro Economics", Tata Mc.Graw Hill, 9/e, 2004.
5. M.L.Seth- "Macro Economics", Lakshmi Narayana Agarwal, 2015.
6. K.P.M. Sundaram - "Money, banking & International Trade", Sultan Chand, 2010.
7. Dillard, D - "The Economics of John Maynard Keynes", Crossby Lockwood & Sons.
8. M.N.Mishra & S.B.Mishra - "Insurance Principles & Practice" S.Chand 2012.
9. Bharati V.Pathak "The Indian Financial System Markets. Institutions & Services". Pearson 2008.
10. Telugu Academy Publication



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Core papers

Economics

B. A. ECONOMICS

II Year B. A. Programme (UG) Courses – Under CBCS

Semester – IV

Paper – IV (Core Paper)

Banking and International Trade

Module - 1

Trade Cycles - meaning and definition - Phases of a Trade Cycle -Inflation - definition - types of inflation - causes and effects of inflation measures to control inflation.

Module - 2

Banking: Meaning and definition -Functions of Commercial Banks - Concept of Credit creation-Functions of RBI - Recent developments in banking sectors.

Module – 3

Non-Bank Financial Institutions – Types of NBFIs - Factors contributing to the Growth of NBFIs –Money market – Defects of Indian money market

Module – 4

Concepts of Shares-Debentures - Stock Market - Functions - Primary and Secondary Markets - SEBI - - Insurance - Life Insurance and General Insurance.

Module - 5

Macro Economic Policy - Fiscal, Monetary and Exchange rate policies
Objectives and Significance - Importance of International Trade - Regional and International Trade – Defining Balance of Trade and Balance of Payment.

REFERENCES:

1. G.Ackley - "Macro Economics Theory and Policy", Collier Macmillan, 1978.
2. E.Shapiro - "Macro Economic Analysis", Galgotia Publications, 1999.
3. Central Statistical Organisations - "National Accounts Statistics".
4. R.Dornbush, s.Fisher and R.Startz - "Macro Economics", Tata Mc.Graw Hill, 9/e, 2004.
5. M.L.Seth - "Macro Economics", Lakshmi Narayana Agarwal, 2015.
6. K.P.M. Sundaram - "Money, banking & International Trade", Sultan Chand, 2010.
7. Dillard, D - "The Economics of John Maynard Keynes", Crossby Lockwood & Sons.
8. M.N.Mishra & S.B.Mishra - "Insurance Principles & Practice" S.Chand 2012.
9. Bharati V.Pathak "The Indian Financial System Markets. Institutions & Services".
10. Pearson.
11. D.M.Mithani & G.K.Murthy - "Business Economics", Himalaya Publishing House, 2015.
12. M.L.Jhingan - Economic Development - Vikas, 2012.
13. G.Omkarnath - Economics - A Primer for India - Orient Blackswan, 2012.
14. Agarwal, V. (2010) Macroeconomics: theory and Policy, Dorling Kindersley (India)



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Core papers

Economics

B. A. ECONOMICS

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – V

Paper – V (Core Paper)

Paper V: CONTEMPORARY INDIAN ECONOMY

Module-I :

Characteristics of India as a developing Economy- Demographic Features of India- Population Dividend- Occupational Structure in India- Trends in the growth of India's National Income.

Module-II :

Tax Reforms and GST- tax Revenue and its devolution to states – Public Debt Redemption Methods- Brief outline of Globalization and its impact on Indian Economy.

Module-III :

Magnitude of poverty in India- Unemployment and its dimensions- Major schemes of rural and urban development- Objectives and achievements of Planning in India- Balanced Regional Development- NITI Ayog.

Module- IV:

Indian Agriculture- Importance of agriculture in India –Factors determining agriculture productivity- Land use and Cropping Pattern in India- Agriculture Infrastructure- Rural Credit- Micro Finance- Self Help Groups- Agriculture price policy- Agriculture Insurance- Food Security.

Module-V:

Industrial policies, 1956, 1991 – Growth and problems of small scale industries in India -Make In India -Foreign direct Investment. Foreign Exchange Management Act (FEMA)- SEZs- Disinvestment Policy in India- Growing importance of Service Sector in India – Banking, Insurance, IT, Education and health.

References:

1. Dhingra I.C., Indian Economy, Sultan Chand, 2014
2. Ruddar Dutt and K.P.M. Sundaram- Indian Economy, Sultan Chand,2015
3. S.K. Misra & V.K. Puri-Indian Economy, Himalaya Publishing House, 2015
4. G.Omkarnath-Economics- A Premier of India, Orient Blackswan, 2012
5. Telugu Academy Publications
6. Dr. S.G.K. Murthy, Indian Economy – Gitam University



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Core papers

Economics

B. A. ECONOMICS

III Year B. A. Programme (UG) Courses – Under CBCS
Semester – V

Paper – VI (Core Paper)

PAPER VI: QUANTITATIVE TECHNIQUES

(Mathematical derivations and proofs are not required. Only applications)

Quantitative Methods

Unit-I: Introduction: Meaning- Definition- Function- Importance and Limitations of Statistics. Collection of Data- Primary and Secondary Data- Schedule and Questionnaire- Diagram and Graphic Presentation of Data (One dimensional and frequency curves).

Unit-II: Measures of Central Tendency: Definition, Objectives and Characteristics of Measures of Central Tendency- Types of Averages- Arithmetic Mean, Geometric Mean, Harmonic Mean- Mean- Mode- Properties of Averages.

Unit-III: Measures of Dispersion: Definition, Objectives of Dispersion- Range- Quartile Deviation- Mean Deviation- Standard Deviation- Coefficient of variation.

Unit-IV: Measures of correlation and Regression : Meaning, Definition and Uses of correlation- Types of Correlation- Karl Pearson's Correlation Coefficient- Spearman's Rank Correlation- Probable Error- Meaning. Utility of Regression Analysis- comparison between Correlation and Regression.

Unit V: Matrix: Definition- Examples- types of Matrices- matrix Addition- Multiplication- Determinant of Matrices- Minors- Co-Factors- Inverse of a Matrix.

REFERENCES:

1. Sivayya K.V. and Satya rao, Business Mathematics, Sarathi Publication, Guntur.
2. Sancheti and Kapoor V.K., Business Mathematics, Sulthan Chand & Sons, New Delhi.
3. D N Elhance, Fundamentals of Statistics, Kithab Mahal, Allahabad.
4. Gupta SC, Fundamentals of Business Statistics, Sulthan Chand & Sons, New Delhi.
5. Aggarwal, Business Statistics, Kalyani Publishers Hyderabad.
6. Reddy CR, Business Statistics, Deep & Deep Publications.
7. S.P. Gupta & V.K. Kapoor, Fundamentals of mathematical Statistics, S. Chand and Co, 2014



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Core papers

B. A. ECONOMICS

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – VI

Paper VII -- AGRICULTURAL ECONOMICS

Module-1

Nature and Scope of Agricultural Economics. Factors affecting agricultural development: technological, institutional and general. Interdependence between agriculture and industry.

Module-2

Concept of production function: input-output and product relationship in farm production.

Module-3

Growth and productivity trends in Indian agriculture with special reference to Andhra Pradesh. Agrarian reforms and their role in economic development.

Module-4

Systems of farming, farm size and productivity relationship in Indian agriculture with special reference to Andhra Pradesh- New agriculture strategy and Green revolution: and its Impact

Module-5

Emerging trends in production, processing, marketing and exports; policy controls and regulations relating to industrial sector with specific reference to agro-industries in agri-business enterprises.

RECOMMENDED / REFERENCE BOOKS

1. Sadhu An, Singh Amarjit and Singh Jasbir (2014), Fundamentals of Agricultural Economics, Himalaya Publishing House, Delhi
2. Lekhi RK and Singh Joginder, Agricultural Economics, Kalyani Publishers
3. Bhaduri, A. (1984), The Economic Structure of Backward Agriculture, Macmillan, Delhi.
4. Bilerami, S.A.R. (1996), Agricultural Economics, Himalayas publishing house, Delhi.
5. Dantwala, M.L. et.al (1991), Indian Agricultural Development Since Independence, Oxford & IBH, New Delhi.



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Core papers

B. A. ECONOMICS

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – VI

Paper – VIII-A1 - Agribusiness Environment in Andhra Pradesh

Module-1

Role of agriculture in development process in Andhra Pradesh vis-à-vis other developed states. Economy wide effects of agriculture in Andhra Pradesh through trickle down effects. Backward and forward linkages of agriculture with rest of economy.

Module-2

Agricultural finance-importance in modern agriculture- performance of agricultural finance in Andhra Pradesh -problems of agricultural finance - Inter linkages of agricultural credit and other input markets and product markets.

Module-3

Dynamics of agriculture-crop (horticulture, field crops), sector-livestock (poultry dairy and fisheries) sector and inter linkages among the sectors. Agribusiness sector in Andhra Pradesh-salient features, constraints, sub sectors of agribusiness-input sector, production sector, processing sector.

Module-4

Growth performance of major agricultural commodities in Andhra Pradesh-production and processing trends in exports and imports of major agricultural commodities.

Module-5

Marketing policy- structure of agri markets - regulated markets - need - activities - structure - APMC act - market legislations - Role of Farmer Groups in the marketing of Agricultural Produce.

References:

1. Adhikary M. 1986. Economic Environment of Business. S. Chand & Sons.
2. Aswathappa K. 1997. Essentials of Business Environment. Himalaya Publ.
3. Francis Cherunilam 2003. Business Environment. Himalaya Publ.



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Core papers

B. A. ECONOMICS

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – VI

Paper – VIII-A2 - Agricultural outputMarketing

Module-1

Structure and Model of Agri-Marketing Organizations with functions: Functions of intermediaries, Marketing Practices in Primary and secondary and terminal market, Regulated markets, co-operative marketing.

Module-2

Marketing costs and margins, Marketing Finance. Marketing Structure of Major agricultural commodities, food grains: Rice, and Maize. Cash Crops; Cotton, Oil Seeds, Vegetables and Fruits, Milk, Meat and Poultry products.

Module-3:

Problems and Challenges in Agriculture Marketing - Market Yards - Support prices - Rural Warehousing.

Module-4:

State Intervention in Agricultural Marketing, Role of Various agencies (Andhra Pradesh Agro, MARKEED, State Department, and FCI, Tobacco Board, Cotton Corporation) and its impact on market efficiency. Agriculture PriceCommission.

Module-5:

Inter-regional and international trade in agriculture; emerging scenario of international trade in agricultural commodities; concept of terms of trade and balance of payments,. WTO and Indian agriculture with special reference to Andhra Pradesh .

References:

1. C.S.G.Krishnamacharyulu & Lalitha Ramakrishnan, "Rural Marketing: Text and Cases", Pearson Education, NewDelhi.
2. Awadhesh Kumar Singh & Satyaprakash Pandey, Rural Marketing: Indian Perspective, New Age International Publishers, NewDelhi.
3. Mamoria, C.B. & Badri Vishal: Agriculture Problems inIndia

4. Arora, R.C., “Integrated Rural Development”, S. Chand Limited, NewDelhi.
5. Gopaldaswamy, T.P., “Rural Marketing: Environment, Problems and Strategies, Vikas Publishing House Pvt. Ltd., NewDelhi.
6. Bedi&Bedi, “Rural Marketing”, Himalaya Publishing House, NewDelhi.

B. A. ECONOMICS

III Year B. A. Programme (UG) Courses – Under CBCS Semester –
VI

Paper – VIII-A3 - Agricultural Input Marketing

Module-1

Agri input marketing – Meaning and importance – distinctive features of Agri. Input marketing – Distribution channels of agri. Inputs – Private, Government, Co-operative and Joint sector. Agri inputs promotional programme – concepts and techniques.

Module-2

Issues in seed marketing – determinants of seed demand – private sector contribution – public sector support to private sector - Distinctive features of Seed Marketing vis – a – vis other Input Marketing – strengths and weaknesses on Indian seed industry.

Module-3

Fertilizer industry scenario – public, private, co-operative and joint sector role – fertilizer production consumption, and imports – fertilizer marketing characteristics. Biofertilizers – its role and scope – major constraints involved – production level – market level – field level. Marketing network/channels.

Module-4

Pesticide industry – an overview – nature of industry growth – consumption crop wise, area wise – demand and supply – market segmentation.-IPM concept development – biopesticides – its role and scope.

Module-5

Agricultural mechanization – benefits and importance and future priorities – scenario of farm implements and machinery sector – economic advantage of mechanization – contribution of agricultural mechanization – Need for the development of agricultural machinery and implements to suit the local resource endowments.



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2020-21

Core papers

History

PROGRAMME: THREE-YEAR B.A.

(With History, Economics and Political Science Disciplines)

Course Code:

Domain Subject: History

Semester-wise Syllabus under CBCS

I Year B. A. –Semester – I

Course1: ANCIENT INDIAN HISTORY & CULTURE (from Indus Valley Civilization to 13th Cen A.D)

Learning Outcomes:

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

- Identify and define various kinds of sources and understand how history books are shaped
- Compare and contrast various stages of progress from IVC to Vedic age and analyze the Jain, Buddhist and Vedic faiths
- Increase the awareness and appreciation of Transition from Territorial States to Emergence of Empires
- Analyze the emergence of the Mauryan and Gupta empires during the “classical age” in India
- Evaluate the key facets of ancient society, polity and culture in South India—the feudalism, and the rise of technology and commerce.
- Critically examine the nature of monarchic rule and develop an comprehensive

Syllabus:

- Unit - 1 Ancient Indian Civilization (from Circa 3000 BC to 6th BC): Indus Valley Civilization - Salient Features; Vedic Age - Society, Polity, Economy, Culture during early and later Vedic period
- Unit - II Ancient Indian History & Culture (6th Century BC to 2nd Century AD): Doctrines and Impact of Jainism and Buddhism; Mauryan Administration, Society, Economy & Culture - Ashoka's Dhamma; Kanishka's Contribution to Indian Culture
- Unit - III History & Culture of South India (2nd Century BC to 8th Century AD): Sangam Literature; Administration, Society, Economy and Culture under Satavahanas; Cultural contribution of Pallavas
- Unit - IV India from 3rd century AD to 8th century AD: Administration, Society, Economy, Religion, Art, Literature and Science & Technology under Guptas – Samudragupta; Cultural contribution of Harsha: Arab Conquest of Sind and its Impact
- Unit - V History and Culture of South India (9th century AD to 13th century AD): Local Self Government of Cholas; Administration, Society, Economy and Culture under Kakatiyas – Rudram Devi



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2020-21

Core papers

History

PROGRAMME: THREE-YEAR B.A.

(With History, Economics and Political Science Disciplines)

Course Code:

Domain Subject: History

Semester-wise Syllabus under CBCS

I Year B. A. – Semester – II

Course 2: MEDIEVAL INDIAN HISTORY & CULTURE (1206 A.D to 1757 A.D)

Learning Outcomes:

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

- Understand the socio, economic and cultural conditions of medieval India
- Describe the advent of Islam in India and study the traces of political and cultural expansion of Turks & Afghans
- Explain the Administration and art and architecture of Vijayanagar Rulers, Mughals and also analyse the rise of the Marathas and the contribution of Shivaji
- Evaluate the establishment of the British rule in India and understand the dangerous consequences disunity at all levels
- Analyze the emergence of composite culture in Indian
- Visualize where places are in relation to one another through map pointing

Syllabus:

Unit - I Impact of Turkish Invasions – Balban, Allauddhin Khilji, Md. Bin Tughlaq - Administration, Society, Economy, Religion and Cultural developments under Delhi Sultanate (from 1206 to 1526 AD)

Unit - II Impact of Islam on Indian Society and Culture – Bhakti Movement; Administration, Society, Economy, Religion and Cultural developments under

Unit - Emergence of Mughal Empire – Babur – Sur Interregnum - Expansion &
III Consolidation of Mughal Empire – Akbar, Jahangir, Shah Jahan, Aurangzeb

Unit - Administration, Economy, Society and Cultural Developments under the Mughals
IV – Disintegration of Mughal Empire - Rise of Marathas under Shivaji

Unit - V Beginning of European Settlements - Anglo- French Struggle.



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Core papers

History

B. A. HISTORY

II Year B. A. Programme (UG) Courses – Under CBCS
Semester – III

Paper – III (Core Paper)

LATE MEDIEVAL & COLONIAL HISTORY OF INDIA (1526 to 1857 A. D.)

(History and Culture of India (1526 – 1857))

Unit – 1	India from 1526 to 1707 A. D.: Emergence of Mughal Empire - Sources, Conditions in India on the eve of Babur's invasion, Brief Summary of Mughal Polity – Sher Shah & Sur Interregnum – Expansion & Consolidation of Mughal Empire – Rise of Marathas & Peshwas.
Unit – II	Administration, Economy, Society and Cultural Developments under the Mughals – Disintegration of Mughal Empire.
Unit - III	India under Colonial Hegemony : Beginning of European Settlements – Anglo-French Struggle – Policies of Expansion - Subsidiary Alliance & Doctrine of Lapse - Consolidation of British Empire in India up to 1857 A. D.
Unit - IV	Economic Policies of the British (1757-1857): Land Revenue Settlements – Commercialization of Agriculture – Impact of Industrial Revolution on Indian Industry ; Administration of the Company – Regulating Charter Acts; Cultural & Social Policies: Humanitarian Measures & Spread of Modern Education
Unit – V	Anti-Colonial Upsurge – Peasant & Tribal Revolts - 1857 Revolt – Causes, Nature & Consequences.

References:

1	Bipan Chandra, Modern India
2	Bipan Chandra, Rise and Growth of Economic Nationalism in India
3	C.A. Bayly, Indian Society and the Making of the British Empire
4	Harbans Mukhia, The Mughals of India
5	Irfan Habib, Medieval India: The study of a Civilization
6	L.P. Sharma, The Mughal Empire
7	R.P. Dutt, India Today
8	Sathis Chandra, Essays on Medieval Indian History

Project Work: Students should be asked to identify structures belonging to Mughal period or colonial period and present status.

Make students to create a collage or collection of images related to a topic.
Images can be hand drawn, printed, or clipped from a magazine or newspaper



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Core papers

History

B. A. HISTORY

II Year B. A. Programme (UG) Courses – Under CBCS
Semester – IV

Paper – IV (Core Paper)

SOCIAL REFORM MOVEMENT & FREEDOM STRUGGLE (1820 to 1947 A.D.)

(History and Culture of India (1857 – 1947))

Unit – I	Social, Religious & Self-Respect Movements: Social & Cultural Awakening – Brahma Samaj, Arya Samaj, Theosophical Society, Ramakrishna Mission, Aligarh Movement – Emancipation of Women – Struggle Against Caste: JyotibaPhule, Narayana Guru, Periyar, Dr. B. R. Ambedkar.
Unit – II	Growth of Nationalism in the 2 nd Half of 19 th Century – Impact of British Colonial Policies under Viceroy's Rule and the Genesis of Freedom Movement – Birth of Indian National Congress.
Unit - III	Freedom Struggle from 1885 to 1920: Moderate Phase — Partition of Bengal - Emergence of Militant Nationalism –Swadeshi & Boycott Movement – Home Rule Movement.
Unit - IV	Freedom Struggle from 1920 to 1947: Gandhiji's Role in the National Movement – Revolutionary Movement –Subhas Chandra Bose.
Unit – V	Muslim League & the Growth of Communalism – Partition of India – Advent of Freedom - Integration of Princely States into Indian Union – SardarVallabhai Patel.

References:

1	Anil Seal, Emergence of Indian Nationalism
2	Banerjee, Sekhar, From Plassey to Partition
3	Bayly, C A., Indian Society and Making of the British Empire
4	Brown, Judith: Gandhi's Rise to Power
5	Chandra, Bipan, et. al., India's Struggle for Independence
6	Chatterjee, Jaya, Bengal Divided: Hindu Communalism and Partition 1932-1947

7	Desai, A. R., : Social Background to Indian Nationalism
8	Dutt, R.P., India Today
9	Joshi, P.C., Rammohun and the Forces of Modernisation in India
10	Sarkar Sumit: Modern India 1885 to 1947
11	Stokes, Eric, Peasants and the Raj
12	R.C. Majumdar, The Struggle for Freedom, BharatiyaVidhyaBhavan Series

Project Work: As part of Internal Assessment, Project Work may be given on regional or local history related to culture, economy, struggles, land relations, cultural institutions and their influence on the society.

They can also be asked to create a play centered on any event in social reform movement or freedom struggle.



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2020-21

Core papers

History

B. A. HISTORY

III Year B. A. Programme (UG) Courses – Under CBCS
Semester – V

Paper – V (Core Paper) AGE

OF RATIONALISM AND HUMANISM THE WORLD

BETWEEN 15TH & 18TH CENTURIES

(History of Modern World (1453 – 1821 A.D))

Unit – I	Feudalism -Geographical Discoveries: Causes – Compass & Maps – Portugal Leads and Western World Follows – Consequences;
Unit – II	The Renaissance Movement: Factors for the Growth of Renaissance – Characteristic Features - Transformation from Medieval to Modern World; Reformation & Counter Reformation Movements: The Background – Protestantism – Spread of the Movement– Counter Reformation– Effects of Reformation
Unit - III	Emergence of Nation States: Contributory Factors - England and other Nation States – Impact due to the Emergence of Nation States :Age of Revolutions: The Glorious Revolution (1688) – Origin of Parliament – Constitutional Settlement – Bill of Rights – Results.
Unit - IV	Age of Revolutions: The American Revolution (1776) – Opening of New World – Causes – Course – Declaration of Independence, 1776 – Bill of Rights, 1791 – Significance.
Unit – V	Age of Revolutions: The French Revolution (1789) – Causes - Teachings of Philosophers - Course of the Revolution – Results.

References:

1	Burke, Peter, The Renaissance
2	C.J.H. Hayes, Modern Europe up to 1870



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Core papers

History

B. A. HISTORY

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – V

Paper – VI (Core Paper)

HISTORY

& CULTURE OF ANDHRA DESA (from 12th to 19th Century A.D.) (History and Culture of Andhra from Satavahanas to 1857 A.D)

+

Unit – 1	Andhra during 12 th & 13 th Centuries A.D.: Kakatiyas – Origin & its Antecedents – Administration – Social & Economic Life – Industries & Trade - Promotion of Literature and Culture – Architecture & Sculpture – Decline; The Age of Reddy Kingdoms: Patronage to Literature – Trade & Commerce.
Unit – II	Andhra between 14 th & 16 th Centuries A.D.: Vijayanagara Empire: Polity, Administration, Society & Economy – Sri Krishna Devaraya and his contribution to Andhra Culture – Development of Literature & Architecture – Decline and Downfall.
Unit - III	Andhra through 16 th & 17 th Centuries A.D.: Evolution of Composite Culture - The OutbShahis of Golkonda – Origin & Decline – Administration, Society & Economy – Literature & Architecture.
Unit - IV	The 18 th & 19 th Centuries in Andhra: East India Company's Authority over Andhra – Three Carnatic Wars – Occupation of Northern Circars and Ceded Districts – Early Uprisings – Peasants and Tribal Revolts.
Unit – V	The 18 th & 19 th Centuries in Andhra: Impact of Company Rule on Andhra – Administration – Land Revenue Settlements – Society – Education - Religion – Impact of Industrial Revolution on Economy – Peasantry & Famines – Contribution of Sir Thomas Munroe, C. P. Brown & Sir Arthur Cotton – Impact of 1857 Revolt in Andhra

References:



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Core papers

History

B. A. HISTORY

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – VI

Paper – VII

HISTORY OF MODERN EUROPE (from 19th Century to 1945 A. D.)

(History of Modern World (1821 – 1945))

Unit – 1	Industrial Revolution: Origin, Nature and Impact.
Unit – II	Unification Movements in Italy & Germany and their Impact.
Unit - III	Communist Revolution in Russia – Causes, Course and Results – Impact on World Order.
Unit - IV	World War I: Age of Rivalry in Europe Between 1870 and 1914 – Results of the War – Paris Peace Conference - League of Nations.
Unit – V	World War II: Causes, Fascism & Nazism – Results; The United Nations Organization: Structure, Functions and Challenges.

References:

1	J.A.Hobson, Imperialism: A Study
2	C.D. Hazen, Modern Europe up to 1945
3	H.A.L.Fisher, History of Europe



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2020-21

Core papers

History



HISTORY

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – VI

Paper – VIII-A-1 (Cluster Elective Paper –1)

CULTURAL TOURISM IN ANDHRA PRADESH

Unit – 1	Concepts of Tourism: Nature – Scope – Definition – Tourists & Excursionists – Domestic & International Tourists.
Unit – II	Types of Tourism: Heritage Tourism – Pilgrimage Tourism - Recreation Tourism – Sports & Adventure Tourism - Advance Tourism – Health Tourism – Environment Tourism.
Unit - III	History and Tourism – Heritage Sites – Definition – Ancient Monuments Preservation Act of 1904, Act of 1958 and Act of 1972 - Archaeological Survey of India – Stage Museums.
Unit - IV	Planning and Development of A.P. Tourism: APTDC – Aims & Objectives – Fairs & Festivals – Andhra Cuisine –Restaurants - Eco Tourism – Beaches & Hill Resorts – Mountaineering – Tourist Places in A.P.
Unit – V	Modalities of Conducting Tourism: Field Work - Visit to a Site – Conduct of



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Core papers

History

B. A. HISTORY

III Year B. A. Programme (UG) Courses – Under CBCS
Semester – VI

**Paper – VIII-A-2 (Cluster Elective Paper 2) POPULAR
MOVEMENTS IN ANDHRA DESA (1848 TO 1956 A.D.)**
(History and Culture of Andhra from 1857 to 2014)

Unit	Content
Unit – I	Social & Self Respect Movements: Social Conditions – <u>Kandukuri Veeresalingam</u> , <u>Raghupathi Venkata Rathnam</u> Naidu, <u>Guruzada Apparao</u> , <u>Komarraju Venkata Laxmana Rao</u> ; New Literary Movements: Causes – <u>Ravaprolu Subbarao</u> , <u>Viswanatha Sathyanarayana</u> , <u>Gurram Jashua</u> , <u>Bovi Bheemanna</u> , <u>Sri Sri</u> – Impact.
Unit – II	Freedom Movement in Andhra (1885-1920): Contributory Factors – <u>Vandemataram</u> Movement – Swadeshi & Boycott programs – Glorious Events at Rajahmundry, Kakinada, <u>Kotappakonda</u> & <u>Tenali</u> – Home Rule Movement in Andhra.
Unit - III	Freedom Movement in Andhra (1920-1947): Non-Cooperation Movement – <u>Chirala Perala Palanadu</u> & <u>Pedanandipadu</u> Activities – <u>Alluri Seetarama Raju</u> & <u>Rampa Revolt (1922-24)</u> – Anti-Simon Commission Movement – Civil Disobedience Movement – <u>Quit India Movement</u> .
Unit -IV	Movement for Separate Andhra State (1953): Causes – Andhra <u>Maha Sabha</u> – Andhra Provincial Congress Committee – Andhra University – Conflict between Coastal Andhra & <u>Rayalaseema</u> – <u>Sri Bagh Pact</u> – Constitution of Committees & <u>their</u> Contribution – <u>Martyrdom of Potti Sriramulu</u> – Formation of separate Andhra State.
Unit-V	Movement for formation of Andhra Pradesh (1956): <u>Visalandhra Mahasabha</u> – Role of Communists – States Reorganization Committee – <u>Gentlemen's Agreement</u> – Formation of Andhra Pradesh.
References:	
1	<u>B. Kesava Narayana</u> , Political and Social Factors in Modern Andhra
2	<u>K. V. Narayana Rao</u> , The Emergence of Andhra Pradesh
3	<u>M. Venkata Rangaiah</u> , The Freedom Struggle in Andhra Pradesh
4	<u>P. R. Rao</u> , History of Modern Andhra
5	<u>Sarojini Regani</u> , Highlights of Freedom Movement
6	<u>Sarojini Regani</u> , □□□□ □□□□□□□□□□ □□□□
7	<u>V. Ramakrishna</u> , Social Reform Movement in Andhra
8	<u>B. Kesava Narayana</u> , Modern Andhra & Hyderabad – 1858 – 1956 A.D., 2016
<p>Project Work: With the aim of understanding of techniques and methods of research and presentation, students should be encouraged to draft a report on local writers, struggles, human rights movements, different types of social discrimination etc.</p>	



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2020-21

Core papers

History



B. A. HISTORY

III Year B. A. Programme (UG) Courses – Under CBCS

Semester – VI

Paper – VIII-A-3 (Cluster Elective Paper – 3) **CONTEMPORARY**

HISTORY OF ANDHRA PRADESH (1956-2014)

Unit – I	Socio-Economic Changes in Andhra Pradesh – River Projects & Infrastructural Development – Education & Scientific Progress – Regional Politics – Emergence of Telugu Desam Party.
Unit – II	Growth of Leftist Ideology – Marxist & Radical Literature – Naxalbari Movement - Communist Activities - Electoral Politics – Present Status of Communist Movement.
Unit - III	Dalit Movement – Understanding Untouchability - Education – Literature - Struggle for Identity – Demand for Political Space.
Unit - IV	Early trends towards Bifurcation: Jai Telengana Movement (1969) – Mulki Rules – Legal Battle - Jai Andhra Movement (1972) – Six Point Formula (1973).
Unit – V	Bifurcation of Andhra Pradesh: Power Politics – Economic Discontentment – Riparian Disputes - Unemployment –Foundation of Telangana RastraSamiti – Movements for separate Telangana & unified Andhra Pradesh – Formation of Telangana State (2014)
References:	
1	Barry Pavier, The Telangana Movement - 1944-51
2	Chinnavva Suri, Agrarian Movement in Andhra, 1921-71
3	K. Ramachandra Murthy, Unveiling Telangana State
4	P.R.Rao, History of Modern Andhra
5	S. Ratnakar, A Brief History of Telangana & Andhra Pradesh
6	Sri Krishna Committee Report
7	TarimelaNagireddy, India Mortgaged
8	Y.V.Krishna Rao, Growth of Capitalism in Indian Agriculture: A Case Study
9	KattiPadmarao, □□□□□□ □
10	Y. Chinnarao, □□□□□□ □□□□
11	News Paper Clippings (2001-2014)
<p>Project Work: Students may be asked to prepare assignments on local caste struggles; regional disparities; aspirations; recent developments etc., through interviews and verifying press reports.</p>	



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Core papers

Computer Application

B.Sc Computer Applications & B. A. Computer Applications
w.e.f. 2020-21

COMPUTER FUNDAMENTALS AND OFFICE TOOLS

Semester	CourseCode	CourseTitle	Hours	Credits
I	C1	COMPUTER FUNDAMENTALS AND OFFICE TOOLS	60	3

Course Objectives:

To introduce the fundamental concepts of Computers, Hardware, Software and able to interact with documentation, Powerpoint, and Spreadsheet.

Course Outcomes:

1. To learn about Basics of Computers
2. To learn about basics of Hardware Components
3. To learn about basics of Operating System Software
4. To learn about basics of Application System Software
5. To practice handful exercises on Documentation, Spreadsheet, Presentation

Unit-I: Basics of Computers :Definition of a Computer - Characteristics and Applications of Computers – Block Diagram of a Digital Computer – Classification of Computers based on size and working – Central Processing Unit – I/O Devices.

Unit-II: Primary, Auxiliary and Cache Memory – Memory Devices. Software, Hardware, Firmware and People ware – Definition and Types of Operating System – Functions of an Operating System – MS-DOS – MS Windows – Desktop, Computer, Documents, Pictures, Music, Videos, Recycle Bin, Task Bar – Control Panel.

Unit-III: MS-Word: Features of MS-Word – MS-Word Window Components – Creating, Editing, Formatting and Printing of Documents – Headers and Footers – Insert/Draw Tables, Table Auto format –Page Borders and Shading – Inserting Symbols, Shapes, Word Art, Page Numbers, Equations – Spelling and Grammar – Thesaurus – Mail Merge.

Unit-IV: MS-PowerPoint: Features of PowerPoint – Creating a Blank Presentation - Creating a Presentation using a Template - Inserting and Deleting Slides in a Presentation – Adding Clip Art/Pictures -Inserting Other Objects, Audio, Video - Resizing and Scaling of an Object – Slide Transition – Custom Animation.

Unit-V: MS-Excel: Overview of Excel features – Creating a new worksheet, Selecting cells, Entering and editing Text, Numbers, Formulae, Referencing cells – Inserting Rows/Columns – Changing column widths and row heights, auto format, changing font sizes, colors, shading.





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Core papers

Computer Application

Programming in C

Semester	CourseCode	CourseTitle	Hours	Credits
II	C2	Programming in C	60	3

CourseObjective:

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

CourseLearningOutcomes:

On completing the subject, students will be able to:

1. Analyze a given problem and develop an algorithm to solve the problem.
2. Understand tokens and control structures in C.
3. Understand arrays and strings and implement them.
4. Understand the right way of using functions, pointers, structures and unions in C
5. Develop and test programs written in C.

UNIT - I:

12 Hrs

Introduction to Algorithms :Algorithm - Key features of Algorithms - examples of Algorithms , Flow Charts.

Introduction to C : Structure of C Program, Writing the first C Program , Files 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 , Type Conversion and Type Casting.

UNIT - II:

16 Hrs

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

Functions : Introduction, using functions – Function declaration/ prototype – Function definition function call – return statement – Passing parameters , Recursive functions .

UNIT - III:

16 Hrs

Arrays: Introduction, Declaration of Arrays , Accessing elements of the Array – Storing Values in Array, One dimensional array -declaration,initialization,Accessing one dimensional array,Passing one dimensional array to function, Two dimensional Arrays-

declaration,initialization,Accessing two dimensional arrays,passing two dimensional arrays to functions.

Strings: Introduction , String and Character functions, String Operations using String functions- strcat() , strcmp() , strcpy() , strlen().

UNIT - IV:

8 Hrs

Pointers: declaring Pointer Variable, Pointer Expressions and Pointer Arithmetic , Passing Arguments to Functions using Pointers, Memory Allocation in C Programs, Drawbacks of Pointers.

UNIT – V:

8 Hrs

Structures: Introduction to structures, Arrays of Structures, Nested Structures .

Union, and Enumerated Data Types:Introduction to Union – accessing union elements , Enumerated Data Types.

TEXT BOOKS:

1. Computer Fundamentals and Programming in C by REEMA THAREJA from OXFORD UNIVERSITY PRESS



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2020-21

Core papers

Computer Application



II YEAR III SEMESTER

PAPER- III : NETWORKS AND INTERNET FOUNDATION

UNIT I

Introduction to Network, advantages and disadvantages of network , Types of Networks – Network topologies, Types of topologies- Connecting Devices – Hubs, Repeaters, Bridges, Routers, Network Interface Cards (NIC) and Switches – Network Operating system - analog and digital signal, analog and digital signal transmission.

UNIT II

Introduction to Network Communication Model- Network Architecture –Application Layer, Presentation Layer, Session Layer, transport Layer, Network Layer, Data-link Layer, Physical Layer.

UNIT III

Introduction to Protocols, TCP/IP Protocol- Protocols and their classification –Address Resolution Protocol(ARP) , Reverse Address Resolution Protocols (RARP) , SMTP, MIME, IMAP, POP, ICMP, HTTP.

UNIT IV

Overview of Internet, revolution of Internet , Internet service providers (ISP) –setting windows environment for dial up networking, search engine, searching web using search engines – audio on internet – newsgroup – subscribing to news groups.

UNIT V

Intranet concepts and architecture, building corporate world wide web protocol, Internet infrastructure, Internet Security design - intranet as business tools, future of intranet.

Bluetooth and other wireless networks.- configuring wireless networks- Security – virus and antivirus, configuring firewalls.

TEXT BOOKS

1. Introduction to Computer Networks by P.K.Singh, VK Global Publications Pvt. Ltd.
2. Wireless Home Networking For Dummies, By Danny Briere, Hurley, Edward Ferris, Wiley publications

REFERENCE BOOKS

1. Computer Networks, Andrew S. Tanenbaum, Pearson edition ,Third Edition
2. Home Networking For Dummies, By Kathy Ivens , Wiley publications



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Core papers

Computer Application

II YEAR IV SEMESTER

Paper – IV: Programming IN C

Unit- I: Introduction to Algorithms and Programming Languages: Algorithm – Key features of Algorithms – Some more Algorithms – Flow Charts. **Introduction to C:** 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 – Type Conversion and Type Casting.

Unit-II: Decision Control and Looping Statements: Introduction to Decision Control Statements –Conditional Branching Statements – Iterative Statements – Nested Loops – Break and Continue Statement – Go to Statement.

Unit- III: Arrays: Introduction – Declaration of Arrays – Accessing elements of the Array – Storing Values in Array – Calculating the length of the Array – Operations on Array – one dimensional array for inter-function communication – Two dimensional Arrays –Operations on Two Dimensional Arrays, **Strings:** Introduction String and Character functions.

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

Unit-V: Pointers: Understanding Computer Memory – Introduction to Pointers – declaring Pointer Variables – Passing Arguments to Functions using Pointer – Pointer and Arrays – Passing Array to Function. **Structure, Union, and Enumerated Data Types:** Introduction – Nested Structures – Arrays of Structures – Structures and Functions - Unions – Enumerated Data Types.

Reference Books:

1. Reema Thareja, Introduction to C programming, Oxford University Press.
2. E Balagurusamy, Programming in ANSI C Tata McGraw-Hill, Sixth Edition.
3. Ashok N Kamthane, Programming with ANSI and Turbo C, Pearson Publisher, 2002.
4. Henry Mulish & Hubert L.Coo Reema Thareja: The Spirit of C: An Introduction to Modern Programming, Jaico Publishing House,1996.



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Core papers

Computer Application



B/A III YEAR V SEMESTER

B

PAPER – V: DATABASE MANAGEMENT SYSTEMS

Database system applications, Database system vs File system, **Views of data:** Data abstraction, Instances and schemas. **Database languages:** DDL, DML. Database users and administrators. Transaction management, **Database system structure:** Storage manager, Query processor.

UNIT – II:

Database design and ER diagrams: Beyond ER design entities, attributes and entity sets, Relationships and relationship sets, additional features of ER model, Concept design with ER model, Conceptual design for large enterprises.

Relational model: Introduction to the relational model, integrity constraint over relations, enforcing integrity constraints, querying relational data, logical database design.

UNIT – III

Schema Refinement: decomposition, problems related to decomposition, FDS: Normalization, Basic normal forms and advanced normal forms.

UNIT – IV

Form of basic SQL query: Examples of basic SQL queries, introduction to nested queries, correlated nested queries set, comparison operators, aggregative operators, null values, comparison using null values, joins. **Views:** Destroying or altering tables and views.

UNIT – V

PL/SQL: Introduction to PL/SQL, structure of PL/SQL program, variables, constants, operators, conditional statements, constraints, procedures, functions.



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2020-21

Core papers

Computer Application

PAPER – VI-A : ELECTRONIC COMMERCE (ELECTIVE)

Unit I

Electronic Commerce Environment and Opportunities: Background, The Electronic Commerce Environment, Electronic Market place Technologies. **Mode of Electronic Commerce:** Electronic Data Interchange, Migration to Open EDI, Electronic Commerce with WWW/Internet, Commerce Net Advocacy, Web Commerce going forward.

Unit II

Approaches to Safe Electronic Commerce: Secure Transport Protocols, Secure Transactions, Secure Electronic Payment Protocol (SEPP), Secure Electronic transaction (SET), Certificates for authentication Security on Web Servers and Enterprise Networks

Unit III

Electronic Cash and Electronic Payment Schemes: Internet Monetary Payment & Security Requirements, Payment and Purchase Order Process, On-line Electronic cash. **Internet / Intranet Security Issues and Solution:** The need for Computer Security, Specific Intruder Approaches, Security Strategies, Security Tools, Encryption, Enterprise Networking and Access to the Internet, Antivirus Programs, Security Teams.

Unit IV

Master Card / Visa secure Electronic Transaction: Introduction, Business Requirements, Concepts, Payments Processing. **E-Mail and Secure E-Mail technologies for Electronic Commerce:** Introduction The Means of Distribution, A Model for Message Handling, E-Mail Handling, Multipurpose Internet Mail Extensions, Message Object Security Services, Comparisons of Security Methods, MIME and Related Facilities for EDI over the Internet.

Unit V

Internet Resources for Commerce Introduction: Introduction, Technologies for Web Servers, Internet Tools Relevant to Commerce, Internet Applications for Commerce, Internet Charges, Internet Access and Architecture.

TEXT BOOK

Web Commerce Technology Handbook, by Daniel Minoli, Emma Minoli, McGraw-Hill



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Core papers

Computer Application

PAPER VI-B : CLOUD COMPUTING (ELECTIVE)

UNIT I

Introduction & Concepts: Introduction to cloud computing: introduction, characteristics of cloud computing, cloud models, cloud services examples, cloud-based services & applications.

Cloud Concepts & Technologies: Virtualization, Load Balancing, Scalability & Elasticity, Deployment, Replication, Monitoring, Software Defined Networking, Networking Function Virtualization, Map Reduce, Identity And Access Management, Service Level Agreements, Billing.

UNIT II

Cloud Services & Platforms: Compute Services, Storage Services, Database Services, Applications Services, Content Delivery Services, Analytics Services, Deployment & Management Services, Identity & Access Management Services, Open Source Private Cloud Software.

UNIT III

Cloud Application Design: Introduction, Design Considerations for Cloud Applications, Reference Architecture for Cloud Applications, Cloud Application Design Methodologies, Data Storage Approaches.

UNIT IV

Python Basics: Introduction, Installing Python, Python Data Types & Data Structures, Control flow, Functions, Modules, Packages, File Handling, Date/Time Operations, Classes 163.

UNIT V

Python for Cloud: Python for Amazon Web Services, Python for Google Cloud Platform, Python for Windows Azure.

TEXT BOOK:

1. Cloud Computing A Hands On Approach By Arshdeep Bahga And Vijay Madisetti
From University Press.



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BI YEAR VI SEMESTER

PAPER – VII

WEBTECHNOLOGIES

UNIT I

HTML: Basic HTML, Document body, Text, Hyper links, adding more formatting, Lists, Tables using images. More HTML: Multimedia objects, Frames, Forms towards interactive, HTML document heading detail.

UNIT II

Cascading Style Sheets: Introduction, using Styles, simple examples, your own styles, properties and values in styles, style sheet, formatting blocks of information, layers.

UNIT III

Introduction to JavaScript: What is DHTML, JavaScript, basics, variables, string manipulations, mathematical functions, statements, operators, arrays, functions. Objects in JavaScript: Data and objects in JavaScript, regular expressions, exception handling

UNIT IV

DHTML with JavaScript: Data validation, opening a new window, messages and confirmations, the status bar, different frames, rollover buttons, moving images,

UNIT V

XML: defining data for web applications, basic XML, document type definition, presenting XML, document object model. Web Services

TEXT BOOKS

1. Web Technologies by A.A.Puntambekar from Technical Publications, Pune

REFERENCE BOOKS

1. INTERNET AND WEB TECHNOLOGIES - Raikamal TMH.

2. TCP/IP PROTOCOL SUITE - Behrouz A. Forouzan, 3rd edition, TMH.



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CLUSTER ELECTIVE

PAPER- VIII-A1 - DESKTOP PUBLISHING TECHNOLOGIES

UNIT I

Basics of Desktop Publishing: what is DTP? – Letterpress Printing – Wooden Types and Metal Types, Hot Metal Types, Printing Photographs - Offset Printing- Gravure – Hardware requirements – Software Requirements – DTP Operator's Arsenal – Test Editors, word Processors, Vector Illustration Applications or drawing Applications, Bitmap Image Editing Application, Page Layout applications - Scanning –Printing –Monitor – briefly Input and Output Devices – Vector graphics and Raster graphics

UNIT II

Fonts – Font Styles, Serif and Sans Serif, Dimensions of font , Fixed pitch fonts and proportional spaced fonts, scaling tracking, kerning, leading and ligatures, fonts in your computer, vector fonts and bitmapped fonts - character level and Paragraph level formatting – Drop Caps – Hyphenations – Alignments –Indentation – Single side and Double Side Documents –Headers and Footers – Selecting the text and graphics – Graphic file formats – screen colors (RGB) and Printer colors (CMYK) –Spot colors and Process Colors – Color Separations – Color Half-tone images - Generic Process of Desktop Publishing.

UNIT – III

PhotoShop7: Introduction – Parts of Page shop window - Open, Save, Close and Create a Image – Using Toolbox – Tool Options bar – Using layers – Layers palette, adding new layer, Hiding layer, Renaming layer, Remove layer, Merge layer, copy and paste with image
– Fascinating colors – Color models, Color Picker, Color palette, Swatches Palette, ICC – Inserting text in images – printing images – filters to improve images.

UNIT – IV

Page Maker7: Introduction of Page Maker- starting of Page Maker – Creating a new publication in Page Maker – Dialog Boxes Document and setup and Save Publication – Close the publication – Text Blocks- drawing a text block by dragging the Mouse cursor, Empty Text block by a Mouse Click

UNIT V

Fitting text Blocks on a page, Inserting pages while placing Text – Handling Pages – Inserting, Deleting and go to the desired pages – using the Toolbox – Using the Tool Bars – Importing text & Pictures – wrapping text around the pictures – Character level formatting – Opening Multiple Publication windows – Using story editor-Using Styles – Pre-defined styles, new style – Using the Document Master Pages – Sample Publication.

TEXT BOOK

1. Rapidex DTP Course by Shirish Chavan, Unicorn Books Pvt. Ltd., Edition 2005



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2020-21

Core papers

Computer Application



CLUSTER ELECTIVE

PAPER –VIII -A2 - MULTIMEDIA SYSTEMS

UNIT II

What is Multimedia?: Definition – Where to use Multimedia – Delivering Multimedia

Text- The Power of Meaning – About Fonts and Faces – Using Text in Multimedia-
Computers and Text – Font Editing and Design Tools – Hyper Media and Hyper Text

UNIT II

Images: Before you Start to Create – Making Still Images – Color – Image File Formats
Sound – The Power of Sound – Digital Audio – MIDI Audio – MIDI vs Digital Audio –
Multimedia System Sounds – Audio File Formats.

UNIT III

Video: Using Video - How Video Works and is Displayed - Digital Video Containers -
Obtaining Video Clips - Shooting and Editing Video

Making Multimedia: The Stages of a Multimedia Project - What You Need: The
Intangibles- What You Need: Hardware - What You Need: Software - What You Need:
Authoring Systems

UNIT IV

Planning and Costing: The Process of Making Multimedia – Scheduling -Estimating - RFPs
and Bid Proposals

Designing and Producing: Designing - Producing

UNIT V

The Internet and Multimedia: Internet History - Internetworking – Multimedia on the Web

Designing for the World Wide Web: Developing for the Web - Text for the Web -Images
for the Web - Sound for the Web - Animation for the Web - Video for the Web

TEXT BOOK

1. Multimedia: Making It Work, Tay Vaughan, 8th Edition, Tara Mc-Graw Hill.

REFERENCE BOOKS

1. Multimedia Systems, John F. Koegel Buford, Pearson edition, 2003
2. Ranjan Parekh, Principles of Multimedia, TMH, 2006. Engineering Evaluation Software
3. Multimedia: Computing, Communication and applications, Ralf Steinmetz and Klara



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Core papers

Computer Application

CLUSTER ELECTIVE

PAPER –VIII –A3 - PHP and My SQL

Unit-I: Building blocks of PHP: Variables, Data Types, Operators and Expressions, Constants.

Flow Control Functions in PHP: Switching Flow, Loops, Code Blocks and Browser Output.

Working with Functions: Defining Functions, Calling functions, returning the values from User- Defined Functions, Variable Scope, Saving State between Function calls with the Static statement, more about arguments.

Unit-II: Working with Arrays: Arrays, Creating Arrays, Some Array-Related Functions.

Working with Objects: Creating Objects, Object Instance.

Working with Strings, Dates and Time: Formatting Strings with PHP, Investigating Strings with PHP, Manipulating Strings with PHP, Using Date and Time Functions in PHP.

Unit-III: Working with Forms: Creating Forms, Accessing Form - Input with User defined Arrays, Combining HTML and PHP code on a single Page, Using Hidden Fields to save state, Redirecting the user, Sending Mail on Form Submission, Working with File Uploads.

Unit-IV: Working with Files and Directories: Including Files with include(), Validating Files, Creating and Deleting Files, Opening a File for Writing, Reading or Appending, Reading from Files, Writing or Appending to a File, Working with Directories, Open Pipes to and from Process Using `popen()`, Running Commands with `exec()`, Running Commands with `system()` or `passthru()`.

Working with Images: Understanding the Image-Creation Process, Necessary Modifications to PHP, Drawing a New Image, Getting Fancy with Pie Charts, Modifying Existing Images, Image Creation from User Input.

Unit-V: Interacting with MySQL using PHP: MySQL Versus MySQLi Functions, Connecting to MySQL with PHP, Working with MySQL Data.

References:

1. Julie C. Meloni, PHP MySQL and Apache, SAMS Teach Yourself, Pearson Education (2007).
2. Xue Bai Michael Ekedahl, The Web Warrior Guide to Web Programming, Thomson (2006)



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2020-21

Core papers

Special English



Paper I – Language and Literature I

Unit 1

1. Brief Survey of the English Language, word Formation, Influences (Latin, French & Scandinavian)
2. Understanding Comprehension
 - A. Of a Literary Prose Passage
 - B. Of a Poem

Unit 2

1. Forms of Poetry
2. Sonnet: On His having arrived at the age of twenty three – John Milton
3. Ode: Ode to the west wind – P. B. Shelley
4. Elegy: Elegy written in a country churchyard – Thomas Gray
5. Ballad: The Solitary Reaper – William Wordsworth

Unit 3

1. Knowledge and Wisdom – Bertrand Russell
2. Florence Nightingale – Lytton Strachey

Unit 4 – Elements / Fiction

The Last Leaf – O. Henry



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**Core papers
Special English**

Paper II – Language and Literature II

Unit 1

1. Methods of word Formation
2. Semantics

Unit 2

1. Allegory
2. Masque
3. Metaphor
4. Hyperbole
5. Personification
6. Irony
7. Farce
8. Simile

Unit 3

Drama: Macbeth – William Shakespeare

Unit 4

1. Paradise Lost Book II – John Milton
2. The Canonization – John Donne



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Core papers
Special English

Paper III - An Introduction to English Language and Literature III

I Unit

1. History of English Literature
2. Restoration and Augustan Periods (17th and 18th Centuries)

II Unit

Literary Forms and Terms

1. Satire
2. Mock-epic
3. Heroic couplet
4. Epistle
5. Heroic tragedy
6. Comedy of manners
7. Genteel Comedy
8. Sentimental Comedy
9. Periodical Essay

III Unit

Poetry

Alexander Pope: Extracts from the Rape of the Lock, Canto-1

IV Unit

Prose

John Ruskin: Sesame and Lillie



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Core papers

Special English

Advanced English Syllabus – IV Semester

Paper IV - An Introduction to English Language and Literature IV

I Unit

1. History of English Literature
2. Restoration and Victorian Periods

II Unit

Literary Forms and Terms

1. Biography
2. Autobiography
3. Melodrama
4. Historical Novel
5. Sentimental Novel
6. Gothic novel, Regional novel
7. Flat character, Round character
8. Protagonist
9. Antagonist

III Unit

Poetry 1

John Keats: Ode to a Nightingale

IV Unit

Prose

Francis Bacon: 1. Of Youth

2. Of Age

3. Of Love

V Unit

Poetry 2

Robert Browning: The Grammarian's Funeral



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Core papers

Special English

Paper-V An Outline of 20th Century Literature

Unit 1

1. History of English Literature
2. Literature in English in 20th Century

Unit 2

Literary Forms and Terms

1. Free Verse
2. Problem Play
3. Well-made play
4. Absurd Drama
5. Kitchen-sink drama
6. Stream of Consciousness Novel
7. Bildungsroman
8. Point of view
9. Setting

Unit 3 - Poetry

Philip Larkin: Church Going

Unit 4 - Prose

George Orwell: Politics and English Language

Unit 5 - Drama

Shakespeare: King Lear



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Special English

Paper VI - Glimpses of World Literature



Unit 1 - Poetry

Wole Soyinka: Telephone Conversation

Unit 2 - Drama

Girish Karnad: Tale-Danda

Unit 3 - Novel

1. Dostoyevsky: Crime and Punishment

2. Ngugi Wa Thiong'o: A Grain of Wheat

Unit 4 - Short Story

Nadine Gordimer: My Son's Story



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Core papers
Special English

Paper VII - A Study of English Language

Unit 1:

Indo-European Family of Languages, Grimm's Law, Verner's Law and the First Sound Shift

Unit 2:

Old English, Middle English, Modern English

Unit 3:

Various Influences on the English Language

Unit 4:

Change of meaning and Word-Formation

Unit 5:

Role of Grammar in Language Development



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Core papers

Special English

Paper VIII (A) - A Study of Literary Criticism

Unit 1

Aristotle: Poetics

Unit 2

Sir Philip Sidney: Apology for Poetry

Unit 3

John Dryden: An Essay of Dramatic Poesy

Unit 4

William Wordsworth: Preface to Lyrical Ballads

Unit 5

Thomas Stearns Eliot: Tradition and Individual Talent



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Special English

Paper VIII (B) – American Literature

Unit 1 – Poetry

1. Walt Whitman: O Captain, My Captain
2. Edwin Arlington Robinson: Richard Cory

Unit – Drama

Arthur Miller: Death of a Salesman

Unit – Novel

Ian McEwan: Atonement

Unit – Essay

Ralph Waldo Emerson: Self Reliance



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Core papers

Special English

Paper VIII (C) - Indian Literature

Unit 1 - Poetry

1. Nissim Ezekiel: The Patriot
2. Toru Dutt: Our Casuarina tree

Unit - Novel

1. Mulk Raj Anand: The Untouchable
2. Jhumpa Lahiri: The Namesake

Unit 3 - Drama

Mahesh Dattani: Final Solutions



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2020-21

Core papers

Computer Application

Semester-wise Syllabus under CBCS(w.e.f. 2020-21 Admitted Batch)

I Year B Com (CA), Semester- I

Discipline: COMPUTER APPLICATIONS

Course 1C: Information Technology

Semester	CourseCode	CourseTitle	Hours	Credits
I	1C	Information Technology	60	3

Course 1C :Information Technology

(Five units with each unit having 12 hours of class work)

Unit	Details
I	Introduction: Computer Definition - Characteristics and Limitations of Computer— Generations of Computer, Classification of Computers, Applications of Computer, Basic Components of PC, Computer Architecture - Primary and Secondary Memories- Input and Output Devices- Operating System- Function of Operating System- Types of Operating System- Languages and its Types
II	MS word: Word Processing – Features-Advantages and Applications- Parts of Word Window- Toolbar-Creating, Saving, Closing, Opening and Editing of a Document-Moving and Coping a Text-Formatting of Text and Paragraph- Bullets and Numbering-Find and Replace - Insertion of objects-Headers and Footers- Page Formatting- Auto Correct- Spelling and Grammar- Mail Merge- Macros
III	MS Excel: Features – Spread Sheet-Workbook – Cell-Parts of a window-Saving, Closing, Opening of a Work Book – Editing – Advantages – Formulas- Types of Function- Templates – Macros – Sorting- Charts – Filtering.
IV	MS Power point: Introduction – Starting – Parts-Creating of Tables- Create Presentation – Templates- Auto Content Wizard-Slide Show-Editing of Presentation-Inserting Objects and charts
V	MS Access: Orientation to Microsoft Access - Create a Simple Access Database - Working with Table Data - Modify Table Data - Sort and Filter Records - Querying a Database -

Create Basic Queries - Sort and Filter Data in a Query - Perform Calculations in a Query - Create Basic Access Forms - Work with Data on Access Forms - Create a Report - Add Controls to a Report - Format Reports



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2020-21

Core papers

Computer Application



Course 2C: E- Commerce & Web Designing

Semester	CourseCode	CourseTitle	Hours	Credits
II	2C	E-Commerce & Web Designing	60	3

Unit	Details
I	Unit I: Introduction: Meaning, Nature, Concepts, Advantages, Disadvantages and reasons for Transacting Online, Types of E-Commerce, e-commerce Business Models (Introduction , Key Elements of a Business Model And Categorizing Major E-Commerce Business Models), Forces Behind e-commerce. Technology used in E-commerce: The dynamics of World Wide Web and Internet (Meaning, EvolutionAnd Features); Designing, Building and Launching e-commerce website (A systematic approach involving decisions regarding selection of hardware, software, outsourcing Vs. in-house development of a website)
II	Unit-II: E-payment System: Models and methods of e-payments (Debit Card, Credit Card, Smart Cards, e-money), Digital Signatures (Procedure, Working And Legal Position), Payment Gateways, Online Banking (Meaning, Concepts, Importance, Electronic Fund Transfer, Automated Clearing House, Automated Ledger Posting), Risks Involved in e-payments.
III	Unit-III: On-line Business Transactions: Meaning, Purpose, Advantages and Disadvantages of Transacting Online, E-Commerce Applications in Various Industries Like {Banking, Insurance, Payment of Utility Bills, Online Marketing, E-Tailing (Popularity, Benefits, Problems and Features), Online Services (Financial, Travel and Career), Auctions, Online Portal, Online Learning, Publishing and Entertainment} Online Shopping (Amazon, Snap Deal, Alibaba, Flipkart, etc.)
IV	Unit-IV: Website designing Designing a home page, HTML document, Anchor tag Hyperlinks, Head and body section, Header Section, Title, Prologue, Links, Colorful Pages, Comment, Body Section, Heading Horizontal Ruler, Paragraph, Tabs, Images And Pictures, Lists and Their Types, Nested Lists, Table Handling.

v Unit V: Advanced Website Designing:

Frames: Frameset Definition, Frame Definition, Nested Framesets, Forms and Form Elements. DHTML and Style Sheets: Defining Styles, elements of Styles, linking a style sheet to a HTML Document, Inline Styles, External Style Sheets, Internal Style Sheets & Multiple Style Sheets.



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Core papers

B.com computers

Computer Application

Semester - III

DSC I C 3.1 - Corporate Accounting

Unit-I

Accounting for Share Capital - Issue, forfeiture and reissue of forfeited shares- concept & process of book building. **(Problems only)**

Unit-II

Issue and Redemption of Debentures - Employee Stock Options – Accounting Treatment for Convertible and Non-Convertible debentures (preparation of Journal and Ledger). **(Problems only)**

Unit –III

Valuation of Goodwill and Shares: Need and methods - Normal Profit Method, Super Profits Method – Capitalization Method - Valuation of shares - Need for Valuation - Methods of Valuation - Net assets method, Yield basis method, Fair value method (including problems).

UNIT – IV

Company Final Accounts: Preparation of Final Accounts – Adjustments relating to preparation of final accounts – Profit and loss account and balance sheet – Preparation of final accounts using computers (including problems).

Unit –V

Provisions of the Companies Act, 2013 relating to issues of shares and debentures - Preparation of Balance Sheet and Profit and Loss Account – Schedule-III. Issue of rights and bonus shares - Buyback of shares (preparation of Journal and Ledger). **(Problems only)**

Reference Books:

1. Corporate Accounting – Haneef & Mukherji,
2. Corporate Accounting – RL Gupta & Radha swami
3. Corporate Accounting – P.C. Tulsian
4. Advanced Accountancy: Jain and Narang
5. Advanced Accountancy: R.L. Gupta and M.Radhaswamy, S Chand.
6. Advanced Accountancy : Chakraborty
7. Modern Accounting: A. Mukherjee, M. Hanife Volume-II McGraw Hill
8. Accounting standards and Corporate Accounting Practices: T.P. Ghosh Taxman
9. Corporate Accounting: S.N. Maheswari, S.R. Maheswari, Vikas Publishing House.
10. Advanced Accountancy: Arutanandam, Raman, Himalaya Publishing House.
11. Advanced Accounts: M.C. Shukla, T.S. Grewal, S.C. Gupta, S. Chand & Company Ltd.,
12. Management Accounting: Shashi K. Gupta, R.K. Sharma, Kalyani Publishers.



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Core papers

Computer Application

DSC 2C 3.2- Business Statistics

Unit 1: Introduction to Statistics:

Definition, importance and limitations of statistics - Collection of data - Schedule and questionnaire – Frequency distribution – Tabulation -Diagrammatic and graphic presentation of data using Computers (Excel).

Unit 2: Measures of Central Tendency:

Characteristics of measures of Central Tendency-Types of Averages – Arithmetic Mean, Geometric Mean, Harmonic Mean, Median, Mode, Deciles, Percentiles, (Problems only)

Unit 3: Measures of dispersion and Skewness:

Properties of dispersion-Range-Quartile Deviation –Mean Deviation-Standard Deviation-Coefficient of Variation-Skewness definition-Karl Pearson's and Bowley's Measures of skewness-Normal Distribution.

Unit 4: Measures of Relation:

Meaning and use of correlation – Types of correlation-Karl Pearson's correlation coefficient – Spearman's Rank correlation-probable error- Calculation of Correlation by Using Computers

Unit 5: Index Numbers:

Index Numbers-Methods of Construction of Index Numbers – Price Index Numbers – Tests of Adequacy of Index Numbers – Cost of Index Numbers. (Problems only)

References:

- | | |
|--|--------------------------------|
| 1. Business Statistics | Reddy, C.R, Deep Publications. |
| 2. Statistics-Problems and Solutions | Kapoor V.K. |
| 3. Fundamentals of Statistics | Elhance.D.N |
| 4. Statistical Methods | Gupta S.P |
| 5. Statistics | Gupta B.N. |
| 6. Fundamentals of Statistics | Gupta S.C |
| 7. Statistics-Theory, Methods and Applications | Sancheti,D.C. &Kapoor V.K |
| 8. Business Statistics | J.K.Sharma |
| 9. Business Statistics | Bharat Jhunjunwala |
| 10. Business Statistics | R.S.Bharadwaj |



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Core papers

Computer Application

Programming IN C

Unit- I

Introduction to Algorithms and Programming Languages: Algorithm – Key features of Algorithms – Some more Algorithms – Flow Charts. **Introduction to C:** 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 – Type Conversion and Type Casting.

Unit-II

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

Unit- III

Arrays: Introduction – Declaration of Arrays – Accessing elements of the Array – Storing Values in Array – Calculating the length of the Array – Operations on Array – one dimensional array for inter-function communication – Two dimensional Arrays –Operations on Two Dimensional Arrays, **Strings:** Introduction String and Character functions.

Unit- IV

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

Unit-V

Pointers: Understanding Computer Memory – Introduction to Pointers – declaring Pointer Variables – Passing Arguments to Functions using Pointer – Pointer and Arrays – Passing Array to Function. **Structure, Union, and Enumerated Data Types:** Introduction – Nested Structures – Arrays of Structures – Structures and Functions - Unions – Enumerated Data Types.

Reference Books:

1. ReemaThareja, Introduction to C programming, Oxford University Press.
2. E Balagurusamy, Programming in ANSI C Tata McGraw-Hill, Sixth Edition.
3. Ashok N Kamthane, Programming with ANSI and Turbo C, Pearson Publisher, 2002.
4. Henry Mulish & Hubert L.CooReemaThareja: The Spirit of C: An Introduction to Modern Programming, Jaico Publishing House,1996.



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Core papers

Computer Application

Semester - IV

DSC ID 4.1- Accounting for Service Organizations

Unit-I: Non-Trading/ Service Organizations

Non profit entities-Features of nonprofit entities-Accounting process-Preparation of summaries – Receipt and payment account – Meaning and special features – Procedure of preparation – Uses and Limitations.

Income and expenditure account – Features – Procedure for preparation – Preparation of Balance Sheet **(Problems only)**

Unit – II Single Entry or Accounts from Incomplete Records:

Single Entry - Features-Books and accounts maintained-Recording of transactions-Ascertainment of Profit.(Statement of Affairs method only). **(Problems only)**

Unit – III - Bank Accounts

Bank Accounts – Books and Registers to be maintained by Banks – Slip System of Posting – Rebate on bills discounted – Schedule of advances – Non forming assets –Banking Regulation Act, 1969 - Legal Provisions Relating to preparation of Final Accounts. **(Problems only)**

Unit-IV: Insurance Companies

Life Insurance Companies –Preparation of Revenue Account, Balance Sheet (including problems) – LIC Act, 1956.

Unit – V - Insurance Claims for Loss of Stocks only

Fire loss claims - Claims for loss of goods - Average clause - Steps calculation. **(Problems only)**

Suggested Readings

1. Corporate Accounting – RL Gupta & M. Radha Swami
2. Corporate Accounting – P.C. Tulsian
3. Company Accounts : Monga, Girish Ahuja and Shok Sehagal
4. Advanced Accountancy: Jain and Narang
5. Advanced Accountancy : R.K. Gupta and M. Radhaswamy
6. Advanced Accountancy : Chakraborty
7. Advanced Accountancy: S.P. Iyengar
8. Modern Accounting: A. Mukherjee, M. Hanife McGraw Hill Company Ltd., New Delhi.
9. Accounting standards and Corporate Accounting Practices: T.P. Ghosh Taxman
10. Corporate Accounting: S.N. Maheswari, S.R. Maheswari, Vikas Publishing.
11. Advanced Accountancy: Arutanandam, Raman, Himalaya Publishing House.
12. Advanced Accounts: M.C. Shukla, T.S. Grewal, S.C. Gupta, S. Chand.



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Computer Application

DSC 2D 4.2 - Business Laws

Unit-I: Contract:

Meaning and Definition of Contract-Essential elements of valid Contract -Valid, Void and Voidable Contracts - Indian Contract Act, 1872.

Unit-II: Offer and Acceptance:

Definition of Valid Offer, Acceptance and Consideration -Essential elements of a Valid Offer, Acceptance and Consideration.

Unit-III: Capacity of the Parties and Contingent Contract:

Rules regarding to Minors contracts - Rules relating to contingent contracts - Different modes of discharge of contracts-Rules relating to remedies to breach of contract.

Unit-IV: Sale of Goods Act 1930:

Contract of sale – Sale and agreement to sell – Implied conditions and warranties – Rights of unpaid vendor.

Unit-V: Cyber Law and Contract Procedures - Digital Signature - Safety Mechanisms.

References:

1. J. Jayasankar, Business Laws, Margham Publication. Chennai -17
2. Kapoor ND, Mercantile Law , Sultan Chand
3. Balachandram V, Business law Tata
4. Tulsian , Business Law Tata
5. Pillai Bhagavathi, Business Law , S.Chand.
6. Business Laws, Maruthi Publishers



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Core papers

Computer Application

DSC3D: Object Oriented Programming with C++



Unit - I Object Oriented Programming

Introduction: Programming Language generations, Object Oriented Paradigm, Basic Concepts of OOPs, Benefits of OOPs, Applications of OOPs, Object Oriented Languages, Difference between OOPs and Procedure Oriented Programming.

Unit – II C++ Basics, Streams based I/O

Introduction to C++, Difference between C and C++, A brief history of C++, General Structure of a C++ program, C++ tokens: Keywords, identifiers, Constants, variables, Strings, Operators in C++. Data types in C++. Special Operators in C++- Scope resolution operator. Streams Based I/O: input function – cin>>, output function – cout<< .

Unit – III Functions, Arrays and Structures, Pointers

Functions: Types of functions. Inline functions, Function- overloading, Introduction to arrays: Declaration of arrays – Different types of arrays: One Dimensional Array, Two Dimensional Array. Character arrays and strings. Structures – Pointers.

Unit - IV Classes and Objects

Classes – Objects , Defining a class, defining member functions, member function with object as arguments and argument as return type, array of objects, friend function and friend class.

Unit - V Constructors, Destructors and Inheritance

Constructors and Destructors - characteristics of constructor, constructor types – Default Parameterized, copy and dynamic constructor overloading, Operator overloading. Derived Classes: Syntax of derived classes, Access to the base class, Overloading inherited member function, multiple inheritance.

Reference Books

1. Object Oriented Programming with C++ - M.T. Somashekara, D.S.Guru, H.S. Nagendraswamy, K.S. Manjunatha, PHI 2nd Edition
2. Object Oriented Programming with C++ - E. Balagurusamy, 4th Edition, Tata Mc Graw Hill Publication
3. Object Oriented Programming in C++ - Robert Lafore, 4th Edition, Pearson Education
4. Object-Oriented Programming with ANSI and Turbo C++



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Core papers

Computer Application

Semester -V

Database Management System

Unit-I

Overview of Database Management System: Introduction, Data and Information, Database, Database Management System, Objectives of DBMS, Evolution of Database Management Systems, Classification of Database Management System.

Unit-II

File-Based System, Drawbacks of File-Based System, DBMS Approach, Advantages of DBMS, Data Models Components of Database System, Database Architecture, DBMS Vendors and their Products.

Unit-III

Entity-Relationship Model: Introduction, The Building Blocks of an Entity-Relationship, Classification of Entity Sets, Attribute Classification, Relationship Degree, Relationship Classification, Generalization and Specialization, aggregation and composition, CODD'S Rules, Relational Data Model, Concept of, Relational Integrity.

Unit-IV

Structured Query Language: Introduction, History of SQL Standard, Commands in SQL, Data types in SQL, Data Definition Language (DDL), Selection Operation Projection Operation, Aggregate Functions, Data Manipulation Language, Table Modification, Table Truncation, Imposition of Constraints, Set Operations.

Unit -V

PL/SQL: Introduction, Structure of PL/SQL, PL/SQL Language Elements, Data Types, Control Structure,, Steps to Create a PL/SQL Program, Iterative Control, Procedure, Function, Exceptions Handling.

Text Books:

1. S.Sumathi, S. Esakkirajan, Fundamentals of Relational Database Management Systems
2. Ivan Bayross, SQL, PL/SQL, The programming language of Oracle, BPB Publications



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2020-21

Core papers

Computer Application

Semester -V

Web Technology

Unit-I

HTML: Basic HTML, Document body, Text, Hyper links, adding more formatting, Lists, Tables using images. **More HTML:** Multimedia objects, Frames, Forms towards interactive, HTML document heading detail.

Unit-II

Cascading Style Sheets: Introduction, using Styles, simple examples, your own styles, properties and values in styles, style sheet, formatting blocks of information, layers.

Unit-III

Introduction to JavaScript: What is DHTML, JavaScript, basics, variables, string manipulations, mathematical functions, statements, operators, arrays, functions. **Objects in JavaScript:** Data and objects in JavaScript, regular expressions, exception handling.

Unit-IV

DHTML with JavaScript: Data validation, opening a new window, messages and confirmations, the status bar, different frames, rollover buttons, moving images.

Unit-V

XML: defining data for web applications, basic XML, document type definition, presenting XML, document object model. Web Services.

Text Books:

1. Web Technology, Chris Bates, Wiley publications

Reference books:

1. Uttam Kumar Roy, Web Technologies, Oxford University Press.
2. Black Book HTML 5.0
3. Complete reference HTML 5.0
4. Web Technology, PHI Publications.



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2020-21

Core papers

Computer Application

E-COMMERCE

Unit-I

Electronic Commerce Environment and Opportunities: Background, The Electronic Commerce Environment, Electronic Market place Technologies. **Mode of Electronic Commerce:** Electronic Data Interchange, Migration to Open EDI, Electronic Commerce with WWW/Internet, Commerce Net Advocacy, Web Commerce going forward.

Unit-II

Approaches to Safe Electronic Commerce: Secure Transport Protocols, Secure Transactions, Secure Electronic Payment Protocol (SEPP), Secure Electronic transaction (SET), Certificates for authentication Security on Web Servers and Enterprise Networks.

Unit-III

Electronic Cash and Electronic Payment Schemes: Internet Monetary Payment & Security Requirements, Payment and Purchase Order Process, On-line Electronic cash. **Internet / Intranet Security Issues and Solution:** The need for Computer Security, Specific Intruder Approaches, Security Strategies, Security Tools, Encryption, Enterprise Networking and Access to the Internet, Antivirus Programs, Security Teams.

Unit-IV

Master Card / Visa secure Electronic Transaction: Introduction, Business Requirements, Concepts, Payments Processing. **E-Mail and Secure E-Mail technologies for Electronic Commerce:** Introduction The Means of Distribution, A Model for Message Handling, E-Mail Handling, Multipurpose Internet Mail Extensions, Message Object Security Services, Comparisons of Security Methods, MIME and Related Facilities for EDI over the Internet.

Unit-V

Internet Resources for Commerce Introduction: Introduction, Technologies for Web Servers, Internet Tools Relevant to Commerce, Internet Applications for Commerce, Internet Charges, Internet Access and Architecture.



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2020-21

Core papers

Computer Application

PHP and My SQL

Unit-I: Building blocks of PHP: Variables, Data Types, Operators and Expressions, Constants.

Flow Control Functions in PHP: Switching Flow, Loops, Code Blocks and Browser Output. **Working with Functions:** Defining Functions, Calling functions, returning the values from User- Defined Functions, Variable Scope, Saving State between Function calls with the Static statement, more about arguments.

Unit-II: Working with Arrays: Arrays, Creating Arrays, Some Array-Related Functions. **Working with Objects:** Creating Objects, Object Instance. **Working with Strings, Dates and Time:** Formatting Strings with PHP, Investigating Strings with PHP, Manipulating Strings with PHP, Using Date and Time Functions in PHP.

Unit-III: Working with Forms: Creating Forms, Accessing Form - Input with User defined Arrays, Combining HTML and PHP code on a single Page, Using Hidden Fields to save state, Redirecting the user, Sending Mail on Form Submission, Working with File Uploads.

Unit-IV: Working with Files and Directories: Including Files with include(), Validating Files, Creating and Deleting Files, Opening a File for Writing, Reading or Appending, Reading from Files, Writing or Appending to a File, Working with Directories, Open Pipes to and from Process Using popen (), Running Commands with exec(), Running Commands with system () or passthru ().

Working with Images: Understanding the Image-Creation Process, Necessary Modifications to PHP, Drawing a New Image, Getting Fancy with Pie Charts, Modifying Existing Images, Image Creation from User Input.

Unit-V: Interacting with MySQL using PHP: MySQL Versus MySQLi Functions, Connecting to MySQL with PHP, Working with MySQL Data.

References:

1. Julie C. Meloni, PHP MySQL and Apache, SAMS Teach Yourself, Pearson Education (2007).
2. Xue Bai Michael Ekedahl, The Web Warrior Guide to Web Programming, Thomson (2006)



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2020-21

Core papers
Commerce

PROGRAMME: THREE-YEAR B Com

(General and Computer Applications)

Course Code:

Domain Subject: Commerce

Semester-wise Syllabus under CBCS

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

I Year B Com (Gen & CA)–Semester – I

Course1A: Fundamentals of Accounting

Learning Outcomes:

At the end of the course, the student will be able to

- Identify transactions and events that need to be recorded in the books of accounts.
- Equip with the knowledge of accounting process and preparation of final accounts of sole trader.
- Develop the skill of recording financial transactions and preparation of reports in accordance with GAAP.
- Analyze the difference between cash book and pass book in terms of balance and make reconciliation.
- Critically examine the balance sheets of a sole trader for different accounting periods.
- Design new accounting formulas & principles for business organisations.

Syllabus:

Unit-I – Introduction

Need for Accounting – Definition – Objectives, – Accounting Concepts and Conventions – GAAP - Accounting Cycle - Classification of Accounts and its Rules – BookKeeping and Accounting - Double Entry Book-Keeping - Journalizing - Posting to Ledgers, Balancing of Ledger Accounts (including Problems).

Unit-II: Subsidiary Books:

Types of Subsidiary Books - Cash Book, Three-column Cash Book- Petty Cash Book (including Problems).

Unit-III: Trial Balance and Rectification of Errors:

Preparation of Trial balance - Errors – Meaning – Types of Errors – Rectification of Errors – Suspense Account (including Problems)

Unit-IV: Bank Reconciliation Statement:

Need for Bank Reconciliation - Reasons for Difference between Cash Book and Pass Book Balances- Preparation of Bank Reconciliation Statement - Problems on both Favourable and Unfavourable Balance (including Problems).

Unit -V: Final Accounts:

Preparation of Final Accounts: Trading account – Profit and Loss account – Balance Sheet – Final Accounts with Adjustments (including Problems).



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2020-21

Commerce

PROGRAMME: THREE-YEAR B COM

(General and Computer Applications)

Course Code:

Domain Subject: Commerce

Semester-wise Syllabus under CBCS

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

I Year B Com (Gen & CA) – Semester – I

Course 1B: Business Organization and Management

Learning Outcomes:

At the end of the course, the student will be able to

- Understand different forms of business organizations.
- Comprehend the nature of Joint Stock Company and formalities to promote a Company.
- Describe the Social Responsibility of Business towards the society.
- Critically examine the various organizations of the business firms and judge the best among them.
- Design and plan to register a business firm. Prepare different documents to register a company at his own.
- Articulate new models of business organizations.

Syllabus:

Unit-I –Introduction Concepts of Business, Trade, Industry and Commerce: Business – Meaning, Definition, Features and Functions of Business - Trade Classification – Aids to Trade – Industry Classification and Commerce - Factors Influencing the Choice of Suitable form of Organisation

Unit –II– Forms of Business Organizations: Features, Merits and Demerits of Sole Proprietorship and Partnership Business - Features Merits and Demerits of Joint Stock Companies - Public Sector Enterprises (PSEs) - Multinational Corporations (MNCs)- Differences between Private Limited Public Limited Company

Unit-III -Company Incorporation: Preparation of Important Documents for Incorporation of Company - Certificate of Incorporation and Certificate of Commencement of Business - Contents of Memorandum and Articles of Association - Contents of Prospectus

Unit-IV- Management: Meaning Characteristics - Fayol's 14 Principles of Management - Administration Vs Management - Levels of Management

Unit-V-Functions of Management: Different Functions of Management - Meaning – Definition – Characteristics Merits and Demerits of Planning - Principles of Organisation – Line and staff of Organisation



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2020-21

Core papers

Commerce

PROGRAMME: THREE-YEAR B COM

(General and Computer Applications)

Course Code:

Domain Subject: Commerce

Semester-wise Syllabus under CBCS

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

I Year B Com (Gen & CA) – Semester – I

Course 1C: Business Environment

Learning Outcomes:

At the end of the course, the student will able to;

- Understand the concept of business environment.
- Define Internal and External elements affecting business environment.
- Explain the economic trends and its effect on Government policies.
- Critically examine the recent developments in economic and business policies of the Government.
- Evaluate and judge the best business policies in Indian business environment.
- Develop the new ideas for creating good business environment.

SYLLABUS:

Unit-I: Overview of Business Environment: Business Environment – Meaning – Characteristics – Scope -Macro and Micro Dimensions of Business Environment - Environmental Analysis.

Unit – II: Economic Environment: Economic Environment – Nature of the Economy – Structure of Economy – Economic Policies & Planning the Economic Condition – NITI Ayog – National Development Council – Five Year Plans

Unit–III: Economic Policies: Economic Reforms and New Economic Policy – New Industrial Policy – Competition Law – Fiscal Policy – Objectives and Limitations – Monetary Policy and RBI

Unit – IV:Social, Political and Legal Environment: Concept of Social Responsibility of Business towards Stakeholders - Demonetisation, GST and their Impact - Political Stability - Legal Changes.

Unit–V:Global Environment :Globalization – Meaning – Role of WTO – WTO Functions - IBRD– Trade Blocks, BRICS, SAARC, ASEAN in Globalisation



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2020-21

Core papers

Commerce

PROGRAMME: THREE-YEAR B COM

(General and Computer Applications)

Course Code:

Domain Subject: Commerce

Semester-wise Syllabus under CBCS

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

I Year B Com (Gen & CA)– Semester – II

Course 2A: Financial Accounting

Learning Outcomes:

At the end of the course the student will be able to;

- Understand the concept of consignment and learn the accounting treatment of the various aspects of consignment.
- Analyze the accounting process and preparation of accounts in consignment and joint venture.
- Distinguish Joint Venture and Partnership and to learn the methods of maintaining records under Joint Venture.
- Determine the useful life and value of the depreciable assets and maintenance of Reserves in business entities.
- Design an accounting system for different models of businesses at his own using the principles of existing accounting system.

Syllabus

Unit-I: Depreciation: Meaning and Causes of Depreciation - Methods of Depreciation: Straight Line – Written Down Value – Annuity and Depletion Method (including Problems).

Unit-II: Provisions and Reserves: Meaning – Provision vs. Reserve – Preparation of Bad Debts Account – Provision for Bad and Doubtful Debts – Provision for Discount on Debtors – Provision for Discount on Creditors - Repairs and Renewals Reserve A/c (including Problems).

Unit-III: Bills of Exchange: Meaning of Bill – Features of Bill – Parties in the Bill – Discounting of Bill – Renewal of Bill – Entries in the Books of Drawer and Drawee (including Problems).

Unit-IV: Consignment Accounts: Consignment - Features - Proforma Invoice - Account Sales – Del-credere Commission - Accounting Treatment in the Books of Consigner and Consignee - Valuation of Closing Stock - Normal and Abnormal Losses (including Problems).

Unit-V: Joint Venture Accounts: Joint Venture - Features - Difference between Joint-Venture and Consignment – Accounting Procedure – Methods of Keeping Records – One Vendor Keeps the Accounts and Separate Set off Books Methods (including Problems).



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2020-21

Core papers

Commerce

PROGRAMME: THREE-YEAR B COM

(General and Computer Applications)

Course Code:

Domain Subject: Commerce

Semester-wise Syllabus under CBCS

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

I Year B Com (Gen & CA)– Semester – II

Course 2B: Business Economics

Learning Outcomes:

At the end of the course, the student will able to;

- Describe the nature of economics in dealing with the issues of scarcity of resources.
- Analyze supply and demand analysis and its impact on consumer behaviour.
- Evaluate the factors, such as production and costs affecting firms behaviour.
- Recognize market failure and the role of government in dealing with those failures.
- Use economic analysis to evaluate controversial issues and policies.
- Apply economic models for managerial problems, identify their relationships, and formulate the decision making tools to be applied for business.

Syllabus

Unit-I: Introduction: Meaning and Definitions of Business Economics - Nature and Scope of Business Economics -Micro and Macro Economics and their Interface.

Unit-II: Demand Analysis: Meaning and Definition of Demand – Determinants to Demand –Demand Function -Law of Demand – Demand Curve – Exceptions to Law of Demand - Elasticity of Demand – Measurements of Price Elasticity of Demand

Unit – III: Production, Cost and Revenue Analysis: Concept of Production Function – Law of Variable Proportion -Law of Returns to Scale - Classification of Costs -Break Even Analysis - Advantages

Unit-IV: Market Structure: Concept of Market – Classification of Markets -Perfect Competition – Characteristics – Equilibrium Price -Monopoly – Characteristics – Equilibrium Under Monopoly.

Unit-V: National Income:Meaning – Definition – Measurements of National Income - Concepts of National Income -Components of National Income-Problems in Measuring National Income



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Core papers

Commerce

PROGRAMME: THREE-YEAR B COM

(General and Computer Applications)

Course Code:

Domain Subject: Commerce

Semester-wise Syllabus under CBCS

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

I Year B Com (Gen)– Semester – II

Course 2C: Banking Theory and Practice

Learning Outcomes:

At the end of the course, the student will able to;

- Understand the basic concepts of banks and functions of commercial banks.
- Demonstrate an awareness of law and practice in a banking context.
- Engage in critical analysis of the practice of banking law.
- Organize information as it relates to the regulation of banking products and services.
- Critically examine the current scenario of Indian Banking system.
- Formulate the procedure for better service to the customers from various banking innovations.

Syllabus:

Unit-I: Introduction:

Meaning & Definition of Bank – Functions of Commercial Banks – Credit Creation with Examples - Kinds of Banks – Central Banking Vs. Commercial Banking.

Unit-II: Banking Systems:

Unit Banking, Branch Banking, Investment Banking - Innovations in Banking – E banking - Online and Offshore Banking, Internet Banking - Anywhere Banking - ATMs – RTGS- NEFT – Mobile Banking

Unit-III: Types of Banks:

Indigenous Banking - Cooperative Banks, Regional Rural Banks, SIDBI, NABARD - EXIM bank

Unit-IV: Banker and Customer:

Meaning and Definition of Banker and Customer – Types of Customers – General Relationship and Special Relationship between Banker and Customer - KYC Norms.

Unit-V: Collecting Banker and Paying Banker:

Concepts - Duties & Responsibilities of Collecting Banker – Holder for Value – Holder in Due Course – Statutory Protection to Collecting Banker - Responsibilities of Paying Banker - Payment Gateways.



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2020-21

Core papers

Commerce

Semester - III

DSC 1 C 3.1- Corporate Accounting

Unit - I :

Accounting for Share Capital - Issue, forfeiture and reissue of forfeited shares- concept & process of book building - **(Problems only)**

Unit - II :

Issue and Redemption of Debentures - Employee Stock Options – Accounting Treatment for Convertible and Non-Convertible debentures (preparation of Journal and Ledger). **(Problems only)**

Unit –III:

Valuation of Good will and Shares : Need and methods - Normal Profit Method, Super Profits Method – Capitalization Method - Valuation of shares - Need for Valuation - Methods of Valuation - Net assets method, Yield basis method, Fair value method (including problems).

UNIT – IV:

Company Final Accounts: Preparation of Final Accounts – Adjustments relating to preparation of final accounts – Profit and loss account and balance sheet – Preparation of final accounts using computers (including problems).

Unit –V

Provisions of the Companies Act, 2013 relating to issues of shares and debentures - Preparation of Balance Sheet and Profit and Loss Account – Schedule-III. Issue of rights and bonus shares - Buyback of shares.**(Problems only)**

Reference Books:

1. Corporate Accounting – Haneef & Mukherji,
2. Corporate Accounting – RL Gupta & Radha swami
3. Corporate Accounting – P.C. Tulsian
4. Advanced Accountancy: Jain and Narang
5. Advanced Accountancy : R.L. Gupta and M.Radhaswamy, S Chand.
6. Advanced Accountancy : Chakraborty
7. Modern Accounting: A. Mukherjee, M. Hanife Volume-II McGraw Hill
8. Accounting standards and Corporate Accounting Practices: T.P. Ghosh Taxman
9. Corporate Accounting: S.N. Maheswari, S.R. Maheswari, Vikas Publishing House.
10. Advanced Accountancy: Arutanandam, Raman, Himalaya Publishing House.
11. Advanced Accounts: M.C. Shukla, T.S. Grewal, S.C. Gupta, S. Chand & Company Ltd.,
12. Management Accounting: Shashi K. Gupta, R.K. Sharma, Kalyani Publishers.

DSC 2C 3.2- Business Statistics

Unit 1: Introduction to Statistics:

Definition, importance and limitations of statistics - Collection of data - Schedule and questionnaire – Frequency distribution – Tabulation -Diagrammatic and graphic presentation of data using Computers (Excel).

Unit 2: Measures of Central Tendency:

Characteristics of measures of Central Tendency-Types of Averages – Arithmetic Mean, Geometric Mean, Harmonic Mean, Median, Mode, Deciles, Percentiles, Properties of averages and their applications.

Unit 3: Measures of dispersion and Skewness:

Properties of dispersion-Range-Quartile Deviation –Mean Deviation-Standard Deviation-Coefficient of Variation-Skewness definition-Karl Pearson's and Bowley's Measures of skewness-Normal Distribution.

Unit 4: Measures of Relation:

Meaning and use of correlation – Types of correlation-Karlpearson's correlation coefficient – Spearman's Rank correlation-probable error-Calculation of Correlation by Using Computers.

Unit 5: Analysis of Time Series & Index Numbers:

Components of Time series- Measurement of trend – Index Numbers-Methods of Construction of Index Numbers – Price Index Numbers – Tests of Adequacy of Index Numbers – Cost of Index Numbers.

Suggested Readings:

- | | |
|--|-------------------------------|
| 1. Business Statistics | Reddy, C.R Deep Publications. |
| 2. Statistics-Problems and Solutions | Kapoor V.K. |
| 3. Fundamentals of Statistics | Elhance.D.N |
| 4. Statistical Methods | Gupta S.P |
| 5. Statistics | Gupta B.N. |
| 6. Fundamentals of Statistics | Gupta S.C |
| 7. Statistics-Theory, Methods and Applications | Sancheti,D.C. &Kapoor V.K |
| 8. Business Statistics | J.K.Sharma |
| 9. Business Statistics | Bharat Jhunjunwala |
| 10. Business Statistics | R.S.Bharadwaj |



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Core papers

Commerce

DSC 3C 3.3 - Banking Theory & Practice

Unit-I: Introduction

Meaning & Definition of Bank – Functions of Commercial Banks – Kinds of Banks - Central Banking Vs. Commercial Banking.

Unit-II: Banking Systems

Unit Banking , Branch Banking, Investment Banking- Innovations in banking – E banking - Online and Offshore Banking , Internet Banking - Anywhere Banking - ATMs - RTGS.

Unit-III: Banking Development

Indigenous Banking - Cooperative Banks, Regional Rural banks, SIDBI, NABARD - EXIM Bank.

Unit-IV: Banker and Customer

Meaning and Definition of Banker and customer – Types of Customers - General Relationship and Special Relationship between Banker and Customer - KYC Norms.

Unit-V: Collecting Banker and Paying Banker

Concepts - Duties & Responsibilities of Collecting Banker – Holder for Value – Holder in Due Course – Statutory Protection to Collecting Banker - Responsibilities of Paying Banker - Payment Gateways.

Books for Reference

1. Banking Theory: Law & Practice : K P M Sundram and V L Varsheney
2. Banking Theory, Law and Practice : B. Santhanam; Margam Publications
3. Banking and Financial Systems : Aryasri
4. Introduction to Banking : Vijaya Raghavan
5. Indian Financial System : M.Y.Khan
6. Indian Financial System : Murthy & Venugopal



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Core papers

Commerce

Semester - IV

DSC 1D 4.1- Accounting for Service Organizations

Unit-I: Non-Trading/ Service Organizations

Non profit entities-Features of nonprofit entities-Accounting process-Preparation of summaries – Receipt and payment account – Meaning and special features – Procedure of preparation – Uses and Limitations.

Income and expenditure account – Features – Procedure for preparation – Preparation of Balance Sheet **(Problems only)**

Unit – II Single Entry or Accounts from Incomplete Records:

Single Entry - Features-Books and accounts maintained-Recording of transactions-Ascertainment of Profit.(Statement of Affairs method only). **(Problems only)**

Unit – III - Bank Accounts

Bank Accounts – Books and Registers to be maintained by Banks – Slip System of Posting – Rebate on bills discounted – Schedule of advances – Non forming assets –Banking Regulation Act, 1969 - Legal Provisions Relating to preparation of Final Accounts. **(Problems only)**

Unit-IV: Insurance Companies

Life Insurance Companies –Preparation of Revenue Account, Balance Sheet (including problems) – LIC Act, 1956.

Unit – V - Insurance Claims for Loss of Stocks only

Fire loss claims - Claims for loss of goods - Average clause - Steps calculation. **(Problems only)**

Suggested Readings

1. Corporate Accounting – RL Gupta & M. Radha Swami
2. Corporate Accounting – P.C. Tulsian
3. Company Accounts : Monga, Girish Ahuja and Shok Sehagal
4. Advanced Accountancy: Jain and Narang
5. Advanced Accountancy : R.K. Gupta and M. Radhaswamy
6. Advanced Accountancy : Chakraborty
7. Advanced Accountancy: S.P. Iyengar
8. Modern Accounting: A. Mukherjee, M. Hanife McGraw Hill Company Ltd., New Delhi.
9. Accounting standards and Corporate Accounting Practices: T.P. Ghosh Taxman
10. Corporate Accounting: S.N. Maheswari, S.R. Maheswari, Vikas Publishing.
11. Advanced Accountancy: Arutanandam, Raman, Himalaya Publishing House.
12. Advanced Accounts: M.C. Shukla, T.S. Grewal, S.C. Gupta, S. Chand.



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2020-21

Core papers

DSC 2D 4.2- Business Laws

Unit-1 Contract

Meaning and Definition of Contract-Essential elements of valid Contract -Valid, Void and Voidable Contracts - Indian Contract Act, 1872.

Unit-2 Offer and Acceptance

Definition of Valid Offer, Acceptance and Consideration -Essential elements of a Valid Offer, Acceptance and Consideration.

Unit-3 Capacity of the Parties and Contingent Contract

Rules regarding to Minors contracts - Rules relating to contingent contracts - Different modes of discharge of contracts-Rules relating to remedies to breach of contract.

Unit-4 Sale of Goods Act 1930

Contract of sale – Sale and agreement to sell – Implied conditions and warranties – Rights of unpaid vendor.

Unit-5:

Cyber Law and Contract Procedures - Digital Signature - Safety Mechanisms.

Suggested Readings:

1. J. Jayasankar, Business Laws, Margham Publication. Chennai -17
2. Kapoor ND, Mercantile Law , Sultan Chand
3. Balachandram V, Business law Tata
4. Tulsian , Business Law Tata
5. Pillai Bhagavathi, Business Law , S.Chand.
6. Business Laws, Maruthi Publishers



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2020-21

Core papers

DSC 3D 4.3- Income Tax

Unit-I

Introduction: Income Tax Law – Basic concepts: Income, Person, Assesse, Assessment year, Agricultural Income, Capital and revenue, Residential status, Income exempt from tax (theory only).

Unit-II

Income from salary: Allowances, perquisites, profits in lieu of salary, deductions from salary income, computation of salary income and qualified savings eligible for deduction u/s 80C (including problems).

Unit-III

Income from House Property: Annual value, let-out/self occupied/deemed to be let-out house, deductions from annual value - computation of income from house property (including problems).

Unit-IV

Income from Capital Gains – Income from other sources – (from Individual point of view) - chargeability – and assessment (including problems).

Unit-V:

Computation of total income of an individual – Deductions under section - 80 (including problems).

Reference Books:

1. Dr. Vinod; K. Singhania; Direct Taxes – Law and Practice, Taxman Publications
2. B.B. Lal; Direct Taxes; Konark Publications
3. Dr. Mehrotra and Dr. Goyal; Direct Taxes – Law and Practice; Sahitya Bhavan Publication.
4. Gaur and Narang; Income Tax, Kalyani Publishers, New Delhi.



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Core papers

Semester - V

5. PERSONAL FINANCE

Unit-I: Investment: Assessment of Income –Objectives of Investment–Factors affecting selection of investment–Time value of money –Future value of investment and annuity –Present value of cash flows and outflows.

Unit-II: Investment Alternatives: Real Estate, Gold, Shares, Bonds, Govt. Securities, Insurance Policies, Mutual Funds, Post Office Saving Schemes, Public Provident Fund, etc.

Unit-III: Security Valuation: Concepts of Return and Risk–Systematic and Nonsystematic risk –Risk-return tradeoff –Equity valuation.

Unit-IV: Bond Valuation: Bond return and valuation – Yield to maturity – Bond value theorem.

Unit-V: Personal Finance Planning: Objectives – Process – Implementation and Implications – Case studies.

References:

1. Punithavathy Pandian, Security Analysis & Portfolio Management, Vikas Publishers, New Delhi.
2. Yassaswy, Personal and Tax Planning, Vision Books, New Delhi.
3. A.N. Shanbag, In the Wonderland of Investment, Popular Prakashan, Bombay.
4. V.N.S.Raman, Investment Principles and Techniques, Vikas Publishing House, New Delhi.
5. Ankit Gala & Khushboo Gala, Investment Planning, Buzzing Stock Publishing.



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2020-21

Core papers

DSC - 1E 5.1 Cost Accounting

Unit-I: Introduction: Distinguish between Financial Accounting, Cost Accounting and management accounting - Cost Concepts and Classification – Cost Centre and Cost Unit – Preparation of Cost Sheet.

Unit-II: Elements of Cost: Materials: Material control – Selective control, ABC technique – Methods of pricing issues – FIFO, LIFO, Weighted average, (problems only).

Unit-III: Labour: Labour: Control of labor costs – Methods of remuneration – labour incentives schemes – Time rate halsey plan, Rowan plan , piece rate- F.W Taylor and Merrick multiple piece rate method (problems only)

Unit-IV: Methods of Costing: Job costing And contract costing – (problems only).

Unit -V: Marginal costing : Marginal Costing – BEP,P/V ratio, Margin of safety (problems only)

References:

1. S.P. Jain and K.L. Narang – Advanced Cost Accounting, Kalyani Publishers, Ludhiana.
2. M.N. Aurora – A test book of Cost Accounting, Vikas Publishing House Pvt. Ltd.
3. S.P. Iyengar – Cost Accounting, Sultan Chand & Sons.
4. Nigam & Sharma – Cost Accounting Principles and Applications, S.Chand & Sons.
5. S.N .Maheswari – Principles of Management Accounting.
6. I.M .Pandey – Management Accounting, Vikas Publishing House Pvt. Ltd.
7. Sharma & Shashi Gupta – Management Accounting, Kalyani Publishers. Ludhiana.



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Core papers

DSC 2E 5.2 ADVANCED ACCOUNTING

Unit –I: Self Balancing System: Meaning, Advantages of Self Balancing System – Preparation of sales ledger adjustment account, purchase ledger adjustment account and General ledger adjustment account. **(Problems only)**

Unit-II: Royalty

Royalties-Preparation of Minimum rent Account, Royalties Account, Short workings Account and Land Lord Account. **(Problems only)**

Unit-III: Branch Accounts

Branch Accounts- Dependent Branch Features- Books of Accounts, Methods of Accounting of dependent branches- Debtors system, stock and Debtor system . **(Problems only)**

Unit IV: Internal Reconstruction: Meaning – Reasons and Factors for Reconstruction Procedure for Capital reduction – Preparation of post reconstruction balance sheet and capital reduction account.(Excluding surrenders of shares) **(Problems only)**

Unit V: Liquidation: Meaning – Liquidation expenses – Liquidators remunerations – Preparation of Liquidators final statement of account. **(Problems only)**

References:

1. Principles and Practice of Accounting R.L Gupta & V.K Gupta Sulthan Chand & Sons.
2. Accountancy-1 Tulasian Tata Mcgraw Hill co
3. Accountancy-1 S.P.Jain K.L Narang Kalyani Publishers
4. Financial Accountancy-Dr V.K.Goyal Excel books
5. Introduction to Accountancy-T.S Grewal S.Chand and Co
6. Accountancy- 1- Haneef and Mukherjee Tata Mcgraw Hill Co
7. Advanced Accountancy- Arunjanadam Himalaya publishers
8. Advanced Accountancy – 1- S.NMaheswari & v.L Maheswari Vikash Publishing Co



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Core papers



DSC 3E 5.3 Commercial Geography

Unit –I: The Earth: Internal structure of the Earth – Latitude – Longitude – Realms of the Earth – Evolution of the Earth – Environmental pollution - Global Warming - Measures to be taken to protect the Earth.

Unit -II: India – Agriculture: Land Use - Soils - Major crops – Food and Non-food Crops – Importance of Agriculture – Problems in Agriculture – Agriculture Development.

Unit -III: India – Forestry: Forests – Status of Forests in Andhra Pradesh – Forest (Conservation) Act, 1980 – Compensatory Afforestation Fund (CAF) Bill, 2015 - Forest Rights Act, 2006 and its Relevance – Need for protection of Forestry.

Unit -IV: India – Minerals and Mining: Minerals – Renewable and non Renewable – Use of Minerals – Mines – Coal, Barites, etc. – Singareni Coal mines and Mangampeta Barites - District-wise Profile.

Unit-V: India – Water Resources – Rivers: Water resources - Rationality and equitable use of water – Protection measures - Rivers - Perennial and peninsular Rivers - Interlinking of Rivers - Experience of India and Andhra Pradesh.

References:

1. Shabiar Ahmad; Quazi ,Natural Resource Consumption and Environment Management, APH Publishing Corporation.
2. Tarachand, Economic and Commercial Geography of India, Vikas Publishing House.
3. Dr. S. Sankaran, Commercial Geography, Margam Publications, Chennai.
4. C. B. Memoria, Commercial Geography, Lal Agarwal & Co.
5. C. B. Memoria, Economic and Commercial Geography, Lal Agarwal & Co.
6. Vinod N. Patel, Commercial Geography, Oxford Book Company



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Core papers

Cluster Elective -1: E-Commerce

DSC 4E 5.4 e-Commerce

Unit-I: e-Commerce: Features of Electronic Commerce - Distinction between e-Commerce and e-Business - Types of Business Models: B2B, B2C, C2C - Benefits and Limitations of e-Commerce - Apps.

Unit-II: e-Business Applications: Integration and e-Business suits - ERP, e-SCM, e-CRM - Methods and benefits of e-Payment Systems –e-Marketing – Applications and issues

Unit-III: e-Business on different Fields: e-Tourism – e-Recruitment – e- Real Estate – e-Stock Market – e-Music/Movies - e-Publishing and e-Books.

Unit-IV: Concept of Online Education: Process - Methods - e-Content development and Deliveries - Major technologies used in e-Education - Online Testing - Methods - Future Trends.

Unit-V: Mobile Commerce: Ticketing - Me-Seva; Government and Consumer Services – e-Retailing - e-Groceries – Security challenges - Case Studies.

References:

1. Turban E. Lee J., King D. and Chung H.M: Electronic commerce-a Managerial Perspective, Prentice-Hall International, Inc.
2. Bhatia V., E-commerce, Khanna Book Pub. Co. (P) Ltd., Delhi.
3. Daniel Amor, E Business R (Evolution), Pearson Education.
4. Krishnamurthy, E-Commerce Management, Vikas Publishing House.
5. David Whiteley, E-Commerce: Strategy, Technologies and Applications, Tata McGraw Hill.
6. P. T. Joseph, E-Commerce: A Managerial Perspectives, Tata McGraw Hill.



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Core papers

DSC 5E 5.5 Business Networks

Unit-I: Business Forms: Interrelation among Stakeholders – Business and Government – Business and Society: Social Network and Facebook.

Unit-II: Business Networking through ICT: Basic concepts – Uses and Application of Business Networks – Different Layers of Business Networks – Internet and Business Networks – Network Security.

Unit-III: Business Networking Systems and Devices: Communication Satellites – Servers – Cloud Computing – Sharing – Spectrum – Commercial issues.

Unit-IV: Customer Relationship Management: Establishing Network connection with customers – Forward and Backward Integration – Customer Data Base – Creation and Maintenance – Legal and Ethical Issues.

Unit-V: Business Analytics: Master Data Management – Data Warehousing and Mining – Data Integration – OLTP and OLAP.

References:

1. Jerry, FitzGerald and Alan Dennis, Business Data Communications and Networking, John Wiley & Sons.
2. Tanenbaum, A. S., Computer Networks, Pearson Education.
3. David A Stamper, Business Data Communications. Addison Wesley.
4. Business Analytics – Methods, Models and Decisions, James R. Evans, Prentice Hall.
5. Business Analytics - An Application Focus, Purba Halady Rao, PHI learning
6. R.N Prasad and Seema Acharya, Fundamentals of Business Analytics, Wiley India.

5.6: Project work



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2020-21

Core papers

Cluster Elective – 2: Banking and Financial Services

DSC 4E 5.4: Central Banking

Unit-I: Introduction : Evolution and Functions of Central Bank –Development of Central Banks in Developed and Developing countries – Trends in Central Bank Functions.

Unit-II: Central banking in India : Reserve Bank of India – Constitution and Governance, Recent Developments, RBI Act. – Interface between RBI and Banks.

Unit-III: Monetary and Credit Policies : Monetary policy statements of RBI – CRR – SLR –Repo Rates – Reverse Repo Rates – Currency in circulation – Credit control measures.

Unit-IV: Inflation and price control by RBI : Intervention mechanisms – Exchange rate stability – Rupee value – Controlling measures.

Unit-V: Supervision and Regulation : Supervision of Banks – Basle Norms, Prudential Norms, Effect of liberalization and Globalization – Checking of money laundering and frauds.

References :

1. Reserve Bank of India Publication, Functions and Working of the RBI
2. Vasant Desai, Central Banking and Economic Development, Himalaya Publishing.
3. S.Panandikar, Banking in India, Orient Longman.
4. Reserve Bank of India Publication, Report on Trends and Progress of Banking in India.
5. Annual Reports of Reserve Bank of India.
6. Rita Swami, Indian Banking System, International Publishing House Pt.Ltd.
7. S.V.Joshi, C.P.Rodrigues and Azhar Khan, Indian Banking System, MacMillan Publishing.





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Core papers

DSC 5E 5.5: Rural and Farm Credit

Unit-I: Rural Credit : Objectives and Significance of Rural credit – Classification of rural credit – General Credit Card (GCC) – Financial Inclusion – Rupay card.

Unit-II: Rural Credit Agencies : Institutional and Non-institutional Agencies for financing agriculture and Rural Development – Self Help Groups (SHG) – Financial for Rural Industries.

Unit-III: Farm Credit : Scope – Importance of farm credit – Principles of Farm Credit – Cost of Credit – Types – Problems and remedial measures – Kisan Credit Card (KCC) Scheme.

Unit-IV: Sources of Farm Credit : Cooperative Credit : PACS – APCOB – NABARD –Lead Bank Scheme – Role of Commercial and Regional Rural Banks – Problems of recovery and over dues.

Unit-V: Farm Credit Analysis : Eligibility Conditions – Analysis of 3 R's (Return, Repayment Capacity and Risk –bearing Capacity) – Analysis of 3 C's of Credit (Character, Capacity and Capital) – Crop index reflecting use and farm credit – Rural Credit Survey Reports.

References :

1. National Bank of Agricultural and Rural Development (NABARD) Annual report.
2. Economy Survey, Government of India.
3. Rural Development, Sundaram I.S., Himalaya Publishing House, Mumbai.
4. Rural Credit in India. C.S.Rayudu, Mittal Publications.
5. Farm Credit and Co-operative in India, Tiruloati V., Naidu. V T Naidu, Vora & Co.Pub Ltd

5.6: Project work



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Core papers

SEMESTER VI

6. TALLY

Unit-I: Fundamentals of Tally.ERP 9: Features - Start Tally, Create and Alter a Company - Creating Single Group/Multiple Groups, Display, Deleting Groups - Ledger: Creating Single Ledger / Multiple Ledgers.

Unit-II: Create Accounting Masters in Tally.ERP 9 - Chart of Accounts - Creating Single and Multiple charts, Displaying and Altering charts – Walkthrough for creating Chart of Accounts – Back-up of data and Restoring - Tally Audit Features.

Unit-III: Creating Inventory Master: Creating Stock Groups, Displaying, Deleting, Altering - Creating Stock Unit of Measure, Displaying and Deleting Unit Measures - Creating, Altering, Displaying, Deleting Stock items - Creating Godowns and Allocation of stock.

Unit-IV: Voucher Entry: Contra Entry, Payments, Receipts, Journals, Purchases, Sales, Debit and Credit Notes, Reversing Journal Voucher, Purchase and Sales Orders, Rejections, Delivery and Receipt Notes, Physical Stock Voucher - Invoicing.

Unit-V: Generating Reports: Trial Balance, Balance Sheet, Profit & Loss A/c, Cash Book, Bank Book - Inventory Books and Registers - Exception Reports - Negative Stock, Negative Ledgers - Practice Exercises.

References:

1. Tally 9 in Simple Steps, Kogent Solutions Inc., John Wiley & Sons.
2. Tally 9.0 (English Edition), (Google eBook) Computer World
3. Tally ERP 9 Made Simple Basic Financial Accounting by BPB Publisher.
4. Tally ERP 9 For Real Time Accounting by Avichi Krishnan



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2020-21

Core papers

DSC 1F 6.1 GOODS & SERVICE TAX FUNDAMENTALS

Unit I: Introduction: Overview of GST - Concepts – Limitations of VAT – Need for Tax Reforms - Justification for introduction of GST - Shortcomings and advantages at the Central Level and State Level on introduction of GST- Process of Introduction of GST - Constitutional Amendments.

Unit II: GST: Principles – Models of GST: Austrlian, Candian, Kelkar-Shah – Bagchi-Poddar -Comprehensive structure of GST model in India: Single, Dual GST–Transactions covered under GST.

Unit-III: Taxes and Duties: Subsumed under GST - Taxes and Duties outside the purview of GST: Tax on items containing Alcohol – Tax on Petroleum products -Tax on Tobacco products - Taxation of Services

Unit-IV: Inter-State Goods and Services Tax: Major advantages of IGST Model –Interstate Goods and Service Tax: Transactions within a State under GST – Interstate Transactions under GST - Illustrations.

Unit-V: Time of Supply of Goods & Services: Value of Supply - Input Tax Credit –Distribution of Credit -Matching of Input Tax Credit - Availability of credit in special circumstances- Cross utilization of ITC between the Central GST and the State GST.

References:

1. Goods and Services Tax in India – Notifications on different dates.
2. GST Bill 2012.
3. Background Material on Model GST Law, Sahitya Bhawan Publications, Hospital Road, Agra - 282 003.
4. The Central Goods and Services Tax Act, 2017, NO. 12 OF 2017 Published by Authority,



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Core papers

DSC 2F 6.2 AUDITING

Unit-I: Auditing: Meaning – Objectives – Importance of Auditing – Auditing as a Vigil Mechanism – Role of Auditor in checking corporate frauds.

Unit-II: Types of Audit: Based on Ownership and time - Independent, Financial, Internal, Cost, Tax, Government, Secretarial audits.

Unit-III: Planning of Audit: Steps to be taken at the commencement of a new audit - Audit programme - Audit note book - Internal check, internal audit and internal control.

Unit-IV: Vouching and Investigation: Vouching of cash and trading transactions - Investigation, Auditing vs. Investigation

Unit-V: Company Audit and Auditors Report: Auditor's Qualifications – Appointment and Reappointment – Rights, duties, liabilities and disqualifications - Audit report: Contents – Preparation - Relevant Provisions of Companies Act, 2013.

References:

1. S.Vengadamani, "Practical Auditing", Margham Publications, Chennai.
2. Ghatalia, "Principles of Auditing", Allied Publishers Pvt. Ltd., New Delhi.
3. Pradeesh Kumar, Baldev Sachdeva & Jagwant Singh, "Auditing Theory and Practice", Kalyani Publications, Ludhiana.
4. N.D. Kapoor, "Auditing", S. Chand, New Delhi.



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Core papers

DSC 3F 6.3 MANAGEMENT ACCOUNTING

Unit–I: Management Accounting: Interface with Financial Accounting and Cost Accounting
- Financial Statement analysis and interpretation: Comparative analysis – Common size analysis
and trend analysis (including problems).

Unit–II: Ratio Analysis: Classification, Importance and limitations - Analysis and interpretation
of Accounting ratios - Liquidity, profitability, activity and solvency ratios (including problems).

Unit–III: Fund Flow Statement: Concept of fund: Preparation of funds flow statement. Uses and
limitations of funds flow analysis (including problems).

Unit–IV: Cash Flow Statement: Concept of cash flow – Preparation of cash flow statement -
Uses and limitations of cash flow analysis (including problems).

Unit–V: Standard Cost: Material variance only (including Problems).

References:

1. S.N. Maheswari, A Textbook of Accounting for Management, S. Chand Publishing, New Delhi.
2. I.M Pandey, "Management Accounting", Vikas Publishing House, New Delhi,
3. Shashi K. Gupta & R.K. Sharma, "Management Accounting: Principles and Practice", Kalyani Publishers, Ludhiana.



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2020-21

Core papers

CLUSTER ELECTIVE -1

DSC 4F 6.4: e-PAYMENTS SYSTEM

Unit-I: e-Cash and Virtual Money: Electronic Data Interchange (EDI) - NEFT/RTGS/Electronic Payment modes - Foundations of e-Cash and Issues; Security, Anonymity, Untraceability, Virtual currencies, Bitcoin.

Unit-II: Automated Clearing and Settlement: Process of Real Time Gross Settlement System - Net Settlement -ATM Networks - Fedwire, CHIPS and SWIFT.

Unit-III: e-Payment Security and Digital Signature: Cryptographic Methods - Hash functions - Public/Private Key methods: RSA - Digital Signatures - Certification Process - Digital identity Documents and Remote Authentication.

Unit-IV: Mobile Payments: Wireless payments, Digital Wallets, Google Wallet – Obopay - Security Challenges.

Unit-V: Electronic Invoice and Payment System: Electronic Statement Delivery - EIPP providers
- Biller service providers - Customer service providers - Reconciliation through Bank -Invoice Paper elimination - Scan-based trading (SBT).

References:

1. Domonique Rambure and Alec Nacamuli, "Payment Systems: From the Salt Mines to the Board Room", Palgrave MacMillan.
2. Weidong Kou, "Payment Technologies for E-Commerce". Springer, Germany.
3. Donal O'Mahony, Michael Peirce and Hitesh Tewari, "Electronic Payment Systems", Artech House, Inc.
4. M. H. Sherif, Protocols for Secure Electronic Commerce, Boca Raton, Fla, CRC Press.



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Core papers



▲ DSC 5F 6.5 SOCIAL MEDIA AND e-MARKETING

Unit-I: Social Media: Career in Social Media Marketing - Strategic Marketing - Social media Planning process - Campaigns (tactics and results).

Unit-II: Social Consumers: Social media marketing segments - Digital consumers - Digital communities - Online communities - Strong & Weak Ties - Social Community - Social Publishing.

Unit-III: Social Media Sites: Face book - Twitter - LinkedIn - YouTube and their Operations - Datamining and Social Media - Role of Social Media in Marketing Research - Social Media and Privacy/Ethics.

Unit-IV: e-Marketing: Objectives, Online Advertising - Distribution in e-Marketing, Lead Generation Platform - Customer Service mechanism - Relationship Building medium.

Unit-V: Methods of e-Marketing: Advertising Techniques, Selling Methods, Sales Promotion - Public Relations - Sponsorship, Merchandising, Teleconferencing - Chatting.

References:

1. Chaffey, D., e-Marketing Excellence: Planning and Optimizing Your Digital Marketing, Burlington: Elsevier.
2. Hanson, W. A. & Kalyanam, K., Internet Marketing & e-Commerce, Thomson Southwestern, Mason, Ohio.
3. Harris, L., Marketing the e-Business, Hoboken: Taylor & Francis.
4. Krishnamurthy, S., Contemporary research in e-Marketing, Hershey, PA: Idea Group Publication.
5. Stephen Dann & Susan Dann, E-Marketing: Theory and Application, Macmillan, New York.
6. Seth Godin, E-Marketing, Berkley Publishing Group.
7. Irvine Clarke & Theresa B. Flaherty Advances in Electronic Marketing, Idea Group Publishing, Hershey.

6.6 PROJECT WORK _____



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2020-21

Core papers

Cluster Elective – 2: Banking and Financial Services
DSC 4F 6.4: Financial Services

Unit-I: Financial Services : Role of Financial Services – Banking and Non Banking Companies – Activities of Non Banking Finance Companies – Fund Based Activities – Fee Based Activities.

Unit-II: Merchant Banking Services : Scope and importance of merchant banking services – Venture Capital – Securitization – Demat Services – Commercial Paper.

Unit-III: Leasing and Hire – Purchase : Types of Lease, Documentation and Legal aspects – Fixation of Rentals and Evaluation – Hire Purchasing – Securitization of debts – House Finance.

Unit-IV: Credit Rating : Purpose – Types – Credit Rating Symbols – Agencies : CRISIL and CARE – Equity Assessment vs. Grading – Mutual funds.

Unit-V: Other Financial Services : Factoring and Forfeiting – Procedural and financial aspects – Installment System – Credit Cards – Central Depository Systems : NSDL, CSDL.

References :

1. B.Santhanam, Financial Services, Margham Publication, Chennai.
2. M.Y.Khan, Financial Services, Tata McGraw – Hill, New Delhi.
3. Machendra Raja, Financial Services, S.Chand Publishers, New Delhi.
4. V.A.Aydhani, Marketing of Financial Services
5. Machiraji, “Indian Financial System”, Vikas Publishers.
6. Sandeep Goel, Financial Services, PH1 Learning.
7. I.M.Bhole, Financial Institutions and Markets, Tata McGraw Hill.
8. SEBI Guidelines, Bharat Publications, New Delhi.
9. E.Gordon & H.Natarajan, Capital Market in India, Himalaya publishing Hous



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2020-21

Core papers

DSC 5F 6.5 : Marketing of Financial Services

Unit-I: Difference between Goods and Services : Managing Service Counters – Integrated Service Management – Service Elements.

Unit-II: Constructing Service Environment : Managing People for service Advantage – Service Quality and Productivity – Customer Loyalty.

Unit-III: Pricing and Promotion Strategies : Pricing strategies – Promotion strategies – B2B Marketing – Marketing Planning and Control for services.

Unit-IV: Distributing Services : Cost and Revenue Management – Approaches for providing services – Channels for Service provision – Designing and managing Service Process.

Unit-V: Retail Financial Services : Investment services – Insurance services – Credit Services – Institutional Financial Services – Marketing practices in select Financial Service Firms.

References :

1. Aradhani “Marketing of Financial Services “ Himalaya Publications.
2. Sinha and Saho, Services Marketing, Himalaya Publishing House.
3. Reddy Appanaiah, Anil Kumar and Nirmala, Services Marketing, Himalaya Publishing.
4. Shajahan, Services Marketing, Himalaya Publishing House.
5. Christopher lovelock, Services Marketing, Pearson Education Ajsa.
6. Helen Woodroffe – Services Marketing, MCMillan India Ltd.
7. S.M.Jha, Services Marketing, New Delhi Himalaya Publishing House.
8. Valarie A.Zeithmal & Mary JoBitner, Services Marketing, New Delhi, Tata McGrawHill

6.6 : Project work |



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2020-21

Core papers

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, Contingency table: 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 Mathematical Statistics, Sultan Chand &



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Core papers

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

Semester – II (CBCS With Maths Combination Common to BA/BSc)

Paper - II: **Probability Theory and Distributions**

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. Poisson approximation to Binomial distribution. Hyper-geometric distribution: Definition, 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 Mathematical Statistics, Sultan Chand & Sons, New Delhi.
- 2 BA/BSc I year statistics - descriptive statistics, probability distribution - Telugu Academy - Dr M.Jaganmohan Rao, Dr N.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:



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2020-21

Core papers

STATISTICS SYLLABUS

Semester – III (CBCS With Maths Combination Common to BA/BSc)

Paper - III : Statistical Methods and Sampling Distributions

No. of Hours/week : 04

credits 3

UNIT – I

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 of type i) and ii) with problems.

UNIT – II

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. Correlation ratio, concept of multiple and partial correlation coefficients (three variables only) and properties

UNIT – III

Regression : Concept of Regression, Linear Regression: Regression lines, Regression coefficients and its properties, Regressions lines for bi-variate data and simple problems. Correlation vs regression. concept of multiple linear regression and partial regression.

UNIT – IV

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, Contingency table: Square contingency(), Mean square contingency(2), Coefficient of mean square contingency (C), Tschuprow's coefficient of contingency (

UNIT – V

Exact Sampling distributions: Population, Sample, Parameter, statistic, Sampling distribution, Standard error. Definition and properties of Student's t- distribution, F – Distribution, - Distribution and their applications, the relationship between t and F – distribution and the relationship between F and distribution.

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

Practicals - Paper -III

1. Fitting of straight line by the method of least squares
2. Fitting of parabola by the method of least squares
3. Fitting of straight line and parabola by the method of least squares using MS Excel.
4. Fitting of power curve of the type by the method of least squares.
5. Fitting of exponential curve of the type and by the method of least squares.
6. Fitting of power curve and exponential curve of the type, and by the method of least squares using MS Excel
7. Computation of Yule's coefficient of association
8. Computation of Pearson's, Tcherprows coefficient of contingency
9. Computation of correlation coefficient and regression lines for ungrouped data



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Core papers

STATISTICS SYLLABUS

Semester – IV (CBCS With Maths Combination Common to BA/BSc)

Paper - IV: Statistical Inference

(Scientific calculators are allowed)



No. of Hours/week : 04

credits 3

UNIT-I

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 (ML), properties of MLE's. Binomial, Poisson & Normal Population parameters estimate by MLE method. Confidence intervals of the parameters of normal population.

UNIT-II

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 – III

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).

UNIT – IV

Small Sample tests: t-test for single mean, difference of means and paired t-test. χ^2 -test for goodness of fit and independence of attributes. F-test for equality of variances.

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.

Practicals - Paper –IV

1. Large sample test for single mean
2. Large sample test for difference of means
3. Large sample test for single proportion
4. Large sample test for difference of proportions
5. Large sample test for difference of standard deviations
6. Large sample test for correlation coefficient
7. Large sample tests for mean(s), propotion(s), standard deviations and correlation coefficient using MS excel.
8. Small sample test for single mean
9. Small sample test for difference of means
10. Small sample test for correlation coefficient
11. Paired t-test(paired samples).
12. Small sample tests for means(s), paired t-test and correlation coefficient using MS Excel
13. Small sample test for single variance(χ^2 - test)
14. Small sample test for difference of variances(F-test)
15. Small sample test for single and difference of variances using MS Excel
16. χ^2 - test for goodness of fit and independence of attributes
17. χ^2 - test for goodness of fit and independence of attributes using MS Excel.
18. Nonparametric tests for single sample(run test, sign test and Wilcoxon signed rank test)
19. Nonparametric tests for related samples (sign test and Wilcoxon signed rank test)
20. Nonparametric tests for two independent samples (Median test, Wilcoxon –Mann- Whitney - U test, Wald - Wolfowitz' s runs test)

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



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Core papers

B.A/B.Sc., STATISTICS (WM) CBCS REVISED SYLLABUS 2020-21
Semester – II to IV (CBCS With Maths Combination Common to BA/BSc)
Paper V: Applied Statistics

UNIT I

Time Series: Time Series and its components with illustrations, additive, multiplicative models. 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 Gompertz 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 SC Gupta.
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.Papaiah Sastry.

Reference Books:

3. Anuvarthita Sankyaka Sastram - Telugu Academy.
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.



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Core papers

STATISTICS SYLLABUS

Semester – V (CBCS With Maths Combination Common to BA/BSc)

Paper - V: SAMPLING THEORY and DESIGN OF EXPERIMENTS

No. of Hours/week : 04

credits 3

UNIT – I

Sampling Theory: Principal steps in sample surveys - census versus sample survey, sampling and non- sampling errors, advantages of sampling over census and limitations of sampling. Types of sampling: Subjective, probability and mixed sampling methods.

UNIT – II

Simple Random Sampling: Simple random sampling, selection procedure of simple random sampling, Advantages and Disadvantages of simple random sampling. Estimation of population mean, population total and variance of these estimates by Simple random sampling with and without replacement. Comparison between SRSWR and SRSWOR.

UNIT – III

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 – IV

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 – V

Randomized Block Design (R.B.D) and Latin Square Design (L.S.D) with their layouts and Analysis, Missing plot technique in RBD and LSD. Efficiency RBD over CRD, Efficiency of LSD over RBD and CRD. Factorial experiments – Main effects and interaction effects of 2^2 and 2^3 factorial experiments and their Statistical analysis. Yates procedure to find factorial effect totals.

Text Books:

1. Telugu Academy BA/BSc III year paper - III Statistics - applied statistics - Telugu academy by Prof.K.Srinivasa Rao, Dr D.Giri, Dr A.Anand, Dr V.Papaiah Sastry.



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Core papers

STATISTICS SYLLABUS

Semester – V (CBCS With Maths Combination Common to BA/BSc)

Paper – VI : Statistical Quality Control and Reliability

No. of Hours/week :04

credits 3

UNIT – I

Statistical Quality Control : Definition, Importance of SQC in industry. Causes of variation-chance and assignable causes, Process and Product control, Importance of Normal distribution and 3σ control limits, specification limits and Natural tolerance limits.

UNIT– II

Shewart control charts – Variable Control Charts- and R-chart, and S- chart. Attribute type of charts - np- chart(No. of defectives), p- chart(Proportion of defectives) with fixed and variable sample size and C-Chart(No. of defects per unit), its applications.

UNIT – III

Acceptance sampling plans: Definition, Types of Accepting sampling plans, Merits and demerits of Acceptance sampling plans, applications, Concept of, AQL and LTPD, Producers risk and Consumer's risk. AOQ and AOQL curves, OC, ASN, and ATI curves.

UNIT – IV

Single and Double sampling plans for attributes and derivation of their OC and ASN functions. Design of single and double sampling plans for attributes.

UNIT – V

Reliability: Meaning and concept of reliability, Reliability measures –Failure Density, Failure Rate or Hazard function, Probability of Failure, Mean Time to Failure(MITF), Mean Time Between Failures(MTBF), Exponential distribution as life model, its memory- less property.

List of reference books :

1. Fundamentals of Applied Statistics. By V.K Kapoor and S.C Gupta , Sultan Chand.
2. Reliability and life testing by S.K.Sinha. Wiley Eastern
3. Statistical Quality Control by R.C.Gupta:
4. B.A/B.Sc III Year Paper-IV Statistics- applied Statistics- Telugu Academic by Prof.K.Srinivasa RAO, Dr.D. Giri, Dr.A.Anand, Dr. V.Papaiah Sastry
5. B.A/B.Sc Statistics Paper-IV Statistics, Quality, Reliability and OR by DVLN Jogiraju, C.Srikala, Palnati Sudarsan.



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Core papers

STATISTICS MODEL QUESTION PAPER

Semester – VI (CBCS With Maths Combination Common to BA/BSc)

Paper – VII: ECONOMIC STATISTICS

No. of Hours/week : 04

credits 3

UNIT-I

Time Series: Time Series and its components with illustrations, additive, multiplicative models. Determination of trend by least squares (Linear trend, parabolic trend only), moving averages method. Determination of seasonal indices by simple averages method, ratio to moving average, Ratio to trend and Link relative methods.

UNIT-II

Growth curves: Modified exponential curve, Logistic curve and Gompertz curve, fitting of growth curves by the method of three selected points and partial sums.

UNIT-III

Index numbers: Concept, construction, problems involved in the construction of index numbers, uses and limitations. Simple and weighted index numbers. Laspeyres's, Paasche's and Fisher's index numbers, Criterion of a good index number, Fisher's ideal index numbers. Fixed and chain base index

numbers. Cost of living index number and wholesale price index number. Base shifting, splicing and deflation of index numbers.

UNIT-IV

Official Statistics: Functions and organization of CSO and NSSO. Agricultural Statistics, area and yield statistics. National income and computation, utility and difficulties in estimation of national income.

UNIT-V

Vital Statistics: Introduction, definition and uses of vital statistics, sources of vital statistics. Mortality rates: Crude death rate(CDR), Specific death rate(SDR), standardized death rate(STDR). Fertility rates: crude birth rate(CBR), age specific fertility rate(ASFR), general fertility rate(GFR), total fertility rate(TFR). Measurement of population growth: crude rate of natural increase and pearl's vital index, Gross reproduction rate(GRR) and net reproduction rate(NRR). Life tables: construction and uses of life tables and abridged life tables.

Text Books:

1. Fundamentals of applied statistics - VK Kapoor and SC Gupta.
 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.Papaiiah Sastry.
- Reference Books:**
3. Indian Official statistics - MR Saluja.



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Core papers

STATISTICS SYLLABUS

Semester – VI (CBCS With Maths Combination Common to BA/BSc)

Paper – VIII(A1): OR and Applications of Linear Programming Problem

No. of Hours/week : 04

Credits: 3

UNIT-I

Basics of OR and Linear Programming Problem: Introduction of OR, Definition, characteristics, scope, applications and limitations of OR. Formulation of linear programming of problems (LPP), Convex sets, Basic feasible solutions, Graphical solution of linear programming problems. Alternative solutions, Unbounded solutions, Non existing feasible solutions by Graphical method.

UNIT-II

Simplex Method : General formulation of LP Problems and Matrix form of LP problems, Slack variable, Surplus variable, unrestricted Variable, Standard form of LPP, Canonical form of LPP. Introduction to simplex method, Definitions and notations, Computational procedure of simplex algorithm. Artificial variable technique, Big-M method and Two-phase simplex method, Degeneracy in LPP and method to resolve degeneracy. Alternative solutions, Unbounded solutions, Non existing feasible solutions and Solution of simultaneous equations by Simplex method.

UNIT-III

Duality in Linear Programming and Dual Simplex Method : Introduction, Definition of Dual Problems, General rules for converting any primal into its Dual, Economic interpretation of duality, Relation between the solution of Primal and Dual problem, Using duality to solve primal problem. Dual Simplex Method.

UNIT-IV

Transportation problem : Introduction, Mathematical formulation of Transportation problem, Tabular representation, Definitions, Initial Basic feasible solution of Transportation problem- North-west corner rule, Lowest cost entry method, Vogel's approximation method. Method of finding optimal solution-Modi method(U-V method). Degeneracy in transportation problems, Resolution of degeneracy, Unbalanced transportation problem.

Assignment problem: Introduction, Mathematical formulation of Assignment problem, Reduction theorem(statement only), Hungarian Method for solving Assignment problem, Unbalanced Assignment problem. The Traveling salesman problem, Formulation of Traveling salesman problem as an Assignment problem and Solution procedure.

UNIT-V

Sequencing problem: Introduction, assumptions of sequencing problem, Johnson's algorithm for n jobs on two machines problem- problems with n-jobs on two machines, algorithm for n jobs on three machines problem- problems with n- jobs on three machines, algorithm for n jobs on k machines problem, problems with n-jobs on k-machines. Graphical method for two jobs on k- machines.

Reference Books:

1. S.D. Sharma, Operations Research, Kedar Nath Ram Nath & Co, Meerut.
2. Kanti Swarup, P.K.Gupta, Manmohm Operations Research, Sultan Chand and sons, New Delhi.



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Core papers

STATISTICS SYLLABUS

Semester – VI (CBCS With Maths Combination Common to BA/BSc)

Paper – VIII(A2): Numerical Methods

No. of Hours/week : 04

Credits 3

UNIT-I

Definitions of Forward difference operator(Δ), Backward difference operator(∇), Shift or Extension(displacement) operator (E), Central Differences operator(μ), Differentiation operator(D), Mean value operator (Symbolic relations between operators, properties of difference and shift operators, fundamental theorem on finite differences and simple problems.

UNIT-II

Interpolation with equal intervals: Concept of interpolation and extrapolation, assumptions and uses of interpolation, difference tables, methods of interpolation with equal intervals - Newton's formula for forward and backward interpolation, Central differences, Gauss forward and backward, Sterling, Bessel's and Lalace-Everett's Formulae,

UNIT-III

Interpolation with unequal intervals: Divided differences and their properties. Methods of interpolation with unequal intervals – Newton's Divided difference formula and Lagrange's formula. Inverse interpolation- Lagrange's formula.

UNIT-IV

Numerical Differentiation: Introduction to Numerical differentiation. Determination of First and Second order derivatives for the given data using Newton's forward and backward, Gauss forward and backward, Sterling, Bessel's and Newton's Divided difference formula.

UNIT-V

Numerical Integration: Introduction to numerical integration, General Quadrature formula for equidistant ordinates, Trapezoidal rule, Simpson's $1/3$ rule, Simpson's $3/8$ rule and Weddle's rule.

Books Recommended:

1. H.C. Saxena, Finite Differences and Numerical Analysis, S. Chand and Company, NewDelhi.
2. P.P.Gupta, G.S.Malik and Sanjay Gupta, Calculus of Finite Differences and Numerical Analysis, Krishna Prakashan Media(P) Ltd., Meerut(UP), India.
3. S.Ranganatham, M.V.S.S.N Prasad, V.Ramesh Babu, S.Chand & Company Ltd.
4. S. S. Sastry, Introductory Methods Numerical Analysis, Prentice- Hall of India.
5. C.F. Gerald and P. O. Wheatley, Applied Numerical Analysis, Addison- Wesley, 1998.



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Core papers

STATISTICS SYLLABUS

Semester – VI (CBCS With Maths Combination Common to BA/BSc)

Paper – VIII(A3); Econometric Methods

No. of Hours/week : 04

Credits :3

UNIT-I

Basic Econometrics: Nature of econometrics and economic data, concept of econometrics, steps in empirical economic analysis, econometric model, importance of measurement in economics, the structure of econometric data, cross section, pooled cross section, time series and paired data, simple regression models, two variable linear regression model, assumptions estimations of parameters.

UNIT-II

Models and Estimations: Gauss marcoff theorem, OLS estimations, partial and multiple correlations coefficients. The general linear model assumptions, estimation and properties of estimators, BLUEs, and tests of significance of estimators, R square and ANOVA.

UNIT-III

Problems in OLS Estimators: Nature, test, consequences and remedial steps of problems of heteroscedasticity; Multicollinearity and Auto-correlation; Problems of specification error; Errors of measurement.

UNIT-IV

Regressions with Qualitative Independent Variables: Dummy variable technique — Testing structural stability of regression models comparing two regressions, interaction effects, seasonal analysis.

UNIT-V

Regressions with Qualitative Independent Variables: Piecewise linear regression, use of dummy variables, regression with dummy dependent variables; The LPM, Logit, Probit and Tobit models — Applications.

BASIC READING LIST

1. Amemiva, T. (1985), Advanced Econometrics, Harvard University Press, Cambridge, Mass.
2. Baltagi, B.H. (1998), Econometrics, Springer, New York.



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Core papers

CBCS PATTERN FOR MICROBIOLOGY

B.Sc MICROBIOLOGY (CBCS) REVISED SYLLABUS - 2020

MBT- I: INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY

TOTAL HOURS: 48

CREDITS: 4

UNIT-I:

No. of hours: 10

History and developments in microbiology. Contributions of Anton von Leeuwenhoek, Edward Jenner, Louis Pasteur, Robert Koch, Ivanowsky. Importance and applications of microbiology. Classification of microorganisms- Whittaker's five kingdom classification, Bergey's Manual of Systematic Bacteriology. General characteristics of Bacteria, Archaea, Mycoplasmas, Cyanobacteria, Fungi, Algae, Protozoa and viruses.

UNIT-II:

No. of hours: 10

Methods of sterilization: Physical methods – Dry heat, moist heat, radiation methods, filtration methods, Chemical sterilization and disinfection methods .

Microbial cultures: Concept of pure culture, Methods of pure culture isolation, pure culture (streak plate, pour plate and spread plate), single cell isolation methods. Preservation of microbial cultures: subculturing, overlaying cultures- mineral oils, lyophilization, and culture storage at low temperature.

UNIT-III:

No. of hours: 8

Staining Techniques - Simple and Differential staining techniques.

Principles of microscopy - Bright field and Electron microscopy (SEM and TEM).

Microbial culture media-Natural basal media, differential media, enriched media enrichment media, selective and transport media, anaerobic culture media.

UNIT-IV:

No. of hours: 10

Microbial growth: Principles of growth, Kinetics of growth, measurement of growth:

Microbial growth: Principles of growth, Kinetics of growth, measurement of growth:
(Direct methods: viable plate counts, membrane filtration). Indirect methods(Metabolic activity

– measurements of DNA, Protein, Microscopic counts,) electronic counters, most probable number; Batch and continuous Synchronous and Diauxic growth, Types of cultures-stock,.
Reproduction in bacteria and spore formation.

UNIT-V:

No. of hours: 10

Cell structure of micro organisms- Cell wall of bacteria (Gram positive and gram negative) and Cell wall of fungi and yeasts- Morphology and chemical composition of bacteria, Actinomycetes, Cell wall lacking bacteria (Mycoplasma, Chlamydiae). Economic importance of algae and fungi.
SCP.



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Core papers



B.Sc MICROBIOLOGY (CBCS) REVISED SYLLABUS – 2020

MBT – II: MICROBIAL PHYSIOLOGY AND BIOCHEMISTRY

TOTAL HOURS: 48

CREDITS: 4

UNIT-I:

No. of hours: 8

Microbial nutrition: Classification of micro organisms based on nutrients (carbon, nitrogen, other energy and electron sources). Autotrophs, heterotrophs, mixotrophs, Phototrophs (Photosynthetic pigments) .

UNIT-II:

No. of hours: 10

Aerobic respiration - Glycolysis, HMP path way, ED path way, TCA cycle, Electron transport, oxidative and substrate level phosphorylation. Kreb'scycle, glyoxylatecycle, hexose monophosphate (HMP) shunt, gluconeogenesis.

Anaerobic respiration Fermentation, Biochemical mechanisms of lacticacid, ethanol, butanol and citricacid fermentations. Nitrate and sulphate respiration. Outlines of oxygenic and anoxy genic photosynthesis in bacteria.

UNIT – III:

No. of hours: 10

General charecters , outline classification of Carbohydrates (Mono,Di and Polysaccharides), Lipids- General charecters–Triglycerides, phospholipids, glycolipids and waxes.

General characters, classification, structure and function of amino acids, Characterization of proteins and classification (primary, secondary, tertiary and quaternary), denaturation of proteins, hydrolysis, protein sequencing methods.

UNIT – IV:

No. of hours: 10

Nucleic acid types, base composition, nucleosides, nucleotides, Structure and functions of DNA (Types of DNA i.e. B, C, D and Z) and RNA (types i.e. m-RNA, r-RNA, t-RNA), Chargaff principles, Denaturation, renaturation and hybridization- $cot^{1/2}$ values.

UNIT- V

No. of hours: 10

Structure, Nomenclature and classification of Enzymes, Kinetics (Michaelis – Menten equation), Factors effecting on enzyme activity (P^H , temperature, concentration) catalised reactions (Lock & Key, Induced Fit). Co-enzymes, co-factors.



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Core papers

B.Sc MICROBIOLOGY (CBCS) SYLLABUS
SECOND YEAR – SEMESTER- III

PAPER-III : MICROBIAL GENETICS AND MOLECULAR BIOLOGY

TOTAL HOURS:48

CREDITS: 4

UNIT-I No. of hours: 10

DNA and RNA as genetic material. Structure and organization of prokaryotic DNA. Extrachromosomal genetic elements – Plasmids and transposons. Replication of DNA – Semi conservative mechanism, Enzymes involved in replication.

UNIT-II No. of hours: 10

Mutations – spontaneous and induced, base pair changes, frame shifts, deletions, inversions, tandem duplications, insertions. Mutagens - Physical and Chemical mutagens. Outlines of DNA damage and repair mechanisms. Genetic recombination in bacteria – Conjugation, Transformation and Transduction.

UNIT-III No. of hours: 10

Concept of gene – Muton, Recon and Cistron. One gene one enzyme and one gene one polypeptide hypotheses. Types of RNA and their functions. Genetic code. Structure of ribosomes.

UNIT-IV No. of hours: 8

Types of genes – structural, constitutive, regulatory Protein synthesis – Transcription and translation. Regulation of gene expression in bacteria – *lac* operon.

UNIT-V No. of hours: 10

Basic principles of genetic engineering. Restriction endonucleases, DNA polymerases and ligases. Vectors. Outlines of gene cloning methods. Polymerase chain reaction. Genomic and cDNA libraries. General account on application of genetic engineering in industry, agriculture and medicine.

PRACTICAL-III : MICROBIAL GENETICS AND MOLECULAR BIOLOGY

TOTAL HOURS: 48

CREDITS: 2

1. Study of different types of DNA and RNA using micrographs and model / schematic representations
2. Study of semi-conservative replication of DNA through micrographs / schematic representations
3. Isolation of genomic DNA from *E. coli*

4. Estimation of DNA using UV spectrophotometer.
5. Resolution and visualization of DNA by Agarose Gel Electrophoresis.
6. Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDSPAGE).
7. Problems related to DNA and RNA characteristics, Transcription and Translation.
8. Induction of mutations in bacteria by UV light.
9. Instrumentation in molecular biology – Ultra centrifuge, Transilluminator, PCR

SUGGESTED READING

- Crueger, W. and Crueger, A. (2000). **Biotechnology: A Text Book of Industrial Microbiology**, PrenticeHall of India Pvt. Ltd., New Delhi.
- Freifelder, D. (1990). **Microbial Genetics**. Narosa Publishing House, New Delhi.
- Freifelder, D. (1997). **Essentials of Molecular Biology**. Narosa Publishing House, New Delhi.
- Glazer, A.N. and Nikaido, H. (1995). **Microbial Biotechnology – Fundamentals of Applied Microbiology**, W.H. Freeman and company, New York.
- Glick, B.P. and Pasternack, J. (1998). **Molecular Biotechnology**, ASM Press, Washington D.C., USA.
- Kannan, N. (2003). **Hand Book of Laboratory Culture Medias, Reagents, Stains and Buffers**. Panima Publishing Co., New Delhi.
- Lewin, B. (2000). **Genes VIII**. Oxford University Press, England
- Maloy, S.R., Cronan, J.E. and Freifelder, D. (1994). **Microbial Genetics**, Jones and Bartlett Publishers, London.
- Nicholl, D.S.T. (2004). **An Introduction to Genetic Engineering**. 2 nd Edition. Cambridge University Press, London.
- Old, R.W. and Primrose, S.B. (1994) **Principles of Gene Manipulation**, Blackwell Science Publication, New York.
- Ram Reddy, S., Venkateshwarlu, K. and Krishna Reddy, V. (2007) **A text Book of Molecular Biotechnology**. Himalaya Publishers, Hyderabad.
- Sinnot E.W., L.C. Dunn and T. Dobzhansky. (1958). **Principles of Genetics**. 5 th Edition. McGraw Hill, New York.
- Smith, J.E. (1996). **Biotechnology**, Cambridge University Press.
- Snyder, L. and Champness, W. (1997). **Molecular Genetics of Bacteria**. ASM press,
- Strickberger, M.W. (1967). **Genetics**. Oxford & IBH, New Delhi.
- Turner, P.C., McLennan, A.G., Bates, A.D. and White, M.R.H. (1998). **Instant Notes in Molecular Biology**, Viva Books Pvt., Ltd., New Delhi.
- Twynan, R.M. (2003). **Advanced Molecular Biology**. Viva books Pvt. Ltd. New Delhi.
- Verma, P.S. and Agarwal, V.K. (2004). **Cell Biology, Genetics, Molecular Biology, Evolution and Ecology**. S. Chand & Co. Ltd., New Delhi.
- Washington, D.C., USA.



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Core papers

B.Sc MICROBIOLOGY (CBCS) SYLLABUS
SECOND YEAR – SEMESTER- IV

PAPER- IV: IMMUNOLOGY AND MEDICAL MICROBIOLOGY

TOTAL HOURS: 48

CREDITS: 4

UNIT-I No. of hours: 10

Types of immunity – innate and acquired; active and passive; humoral and cell-mediated immunity. Primary and secondary organs of immune system – thymus, bursa fabricus, bone marrow, spleen and lymph nodes. Cells of immune system. Identification and function of B and T lymphocytes, null cells, monocytes, macrophages, neutrophils, basophils and eosinophils.

UNIT-II No. of hours: 10

Antigens – types, chemical nature, antigenic determinants, haptens. Factors affecting antigenicity. Antibodies – basic structure, types, properties and functions of immunoglobulins. Types of antigen-antibody reactions - Agglutinations, Precipitation, Neutralization, complement fixation, blood groups. Labeled antibody based techniques – ELISA, RIA and Immunofluorescence. Polyclonal and monoclonal antibodies – production and applications. Concept of hypersensitivity and Autoimmunity.

UNIT-III No. of hours: 10

Normal flora of human body. Host pathogen interactions: infection, invasion, pathogen, pathogenicity, virulence and opportunistic infection. General account on nosocomial infection. General principles of diagnostic microbiology- collection, transport and processing of clinical samples. General methods of laboratory diagnosis - cultural, biochemical, serological and molecular methods.

UNIT-IV No. of hours: 8

Antibacterial Agents- Penicillin, Streptomycin and Tetracycline. Antifungal agents – Amphotericin B, Griseofulvin Antiviral substances - Amantadine and Acyclovir Tests for antimicrobial susceptibility. Brief account on antibiotic resistance in bacteria - Methicillin-resistant Staphylococcus aureus (MRSA). Vaccines – Natural and recombinant.

UNIT-V No. of hours: 10

General account on microbial diseases – causal organism, pathogenesis, epidemiology, diagnosis, prevention and control Bacterial diseases – Tuberculosis and Typhoid Fungal diseases – Candidiasis. Protozoal diseases – Malaria. Viral Diseases - Hepatitis- A and AIDS

PRACTICAL-IV : IMMUNOLOGY AND MEDICAL MICROBIOLOGY

TOTAL HOURS: 48

CREDITS: 2



1. Identification of human blood groups.
2. Separate serum from the blood sample (demonstration).
3. Estimation of blood haemoglobin.
4. Total Leukocyte Count of the given blood sample.
5. Differential Leukocyte Count of the given blood sample.
6. Immunodiffusion by Ouchterlony method.
7. Identify bacteria (*E. coli*, *Pseudomonas*, *Staphylococcus*, *Bacillus*) using laboratory strains on the basis of cultural, morphological and biochemical characteristics: IMViC, urease production and catalase tests
8. Isolation of bacterial flora of skin by swab method.
9. Antibacterial sensitivity by Kirby-Bauer method
10. Study symptoms of the diseases with the help of photographs: Anthrax, Polio, Herpes, chicken pox, HPV warts, Dermatomyces (ring worms)
11. Study of various stages of malarial parasite in RBCs using permanent mounts.

SUGGESTED READING

- Abbas AK, Lichtman AH, Pillai S. (2007). **Cellular and Molecular Immunology**. 6th edition Saunders Publication, Philadelphia.
- Ananthanarayan R. and Paniker C.K.J. (2009) **Textbook of Microbiology**. 8th edition, University Press Publication
- Brooks G.F., Carroll K.C., Butel J.S., Morse S.A. and Mietzner, T.A. (2013) J aPwubetlzc, aMtioenln ick and Adelberg's **Medical Microbiology**. 26th edition. McGraw Hill
- Delves P, Martin S, Burton D, Roitt IM. (2006). **Roitt's Essential Immunology**. 11th edition Wiley-Blackwell Scientific Publication, Oxford.
- Goering R., Dockrell H., Zuckerman M. and Wakelin D. (2007) Mims' **Medical Microbiology**. 4th edition. Elsevier
- Goldsby RA, Kindt TJ, Osborne BA. (2007). **Kuby's Immunology**. 6th edition W.H. Freeman and Company, New York.
- Kuby's **Immunology**. 6th edition W.H. Freeman and Company, New York.
- Jawetz, Melnick and Adelberg's **Medical Microbiology**. 26th edition. McGraw Hill
- Microbiology. 4th edition. Elsevier Publication
- Richard C and Geiffrey S. (2009). **Immunology**. 6th edition. Wiley Blackwell Publication.
- Willey JM, Sherwood LM, and Woolverton CJ. (2013) Prescott, Harley and Klein's **Microbiology**. 9th edition. McGraw Hill Higher Education



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Core papers

B.Sc MICROBIOLOGY (CBCS) SYLLABUS
THIRD YEAR – SEMESTER- V

PAPER-V: ENVIRONMENTAL & AGRICULTURAL MICROBIOLOGY

TOTAL HOURS: 36

CREDITS: 3

UNIT - I No. of hours: 8

Terrestrial Environment: Soil profile and soil microflora Aquatic Environment: Microflora of fresh water and marine habitats Atmosphere: Aeromicroflora and dispersal of microbes Extreme Habitats: Extremophiles: Microbes thriving at high & low temperatures, pH, high hydrostatic & osmotic pressures, salinity, & low nutrient levels.

UNIT – II No. of hours: 8

Role of microorganisms in nutrient cycling (Carbon, nitrogen, phosphorus). Treatment and safety of drinking (potable) water, methods to detect potability of water samples: (a) standard qualitative procedure: presumptive test/MPN test, confirmed and completed tests for faecal coliforms (b) Membrane filter technique. Microbial interactions – mutualism, commensalism, antagonism, competition, parasitism, predation.

UNIT – III No. of hours: 6

Outlines of Solid Waste management: Sources and types of solid waste, Methods of solid waste disposal (composting and sanitary landfill). Liquid waste management: Composition and strength of sewage (BOD and COD), Primary, secondary (oxidation ponds, trickling filter, activated sludge process and septic tank) and tertiary sewage treatment.

UNIT – IV No. of hours: 7

Plant Growth Promoting Microorganisms - Mycorrhizae, Rhizobia, Azospirillum, Azotobacter, Frankia, phosphate-solubilizers and Cyanobacteria. Outlines of biological nitrogen fixation (symbiotic, non-symbiotic). Biofertilizers - Rhizobium.

UNIT – V No. of hours: 7

Concept of disease in plants. Symptoms of plant diseases caused by fungi, bacteria, and viruses. Plant diseases - groundnut rust, Citrus canker and tomato leaf curl. Principles of plant disease control.

PRACTICAL-V: ENVIRONMENTAL & AGRICULTURAL MICROBIOLOGY

TOTAL HOURS: 36

CREDITS: 2

1. Analysis of soil – pH, Moisture content and water holding capacity.



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▲ **B.Sc MICROBIOLOGY (CBCS) SYLLABUS**
THIRD YEAR – SEMESTER -V

PAPER-VI A: MICROBIAL DIAGNOSIS IN HEALTH CLINICS (ELECTIVE)
TOTAL HOURS: 36 **CREDITS: 3**

UNIT- I No. of hours: 8

Bacterial, Viral, Fungal and Protozoan Diseases of various human body systems, Disease associated clinical samples for diagnosis.

UNIT- II No. of hours: 8

Collection of clinical samples (oral cavity, throat, skin, blood, CSF, urine and faeces) and precautions required. Method of transport of clinical samples to laboratory and storage.

UNIT- III No. of hours: 8

Examination of sample by staining - Gram stain, Ziehl-Neelson staining for tuberculosis, Giemsa-stained thin blood film for malaria Preparation and use of culture media - Blood agar, Chocolate agar, Lowenstein-Jensen medium, MacConkey agar, Distinct colony properties of various bacterial pathogens.

UNIT- IV No. of hours: 6

Serological Methods - Agglutination, ELISA, immunofluorescence, Nucleic acid based methods - PCR, Nucleic acid probes. Typhoid, Dengue and HIV, Swine flu.

UNIT- V No. of hours: 6

Importance, Determination of resistance/sensitivity of bacteria using disc diffusion method, Determination of minimal inhibitory concentration (MIC) of an antibiotic by serial double dilution method

PRACTICAL-VI A: MICROBIAL DIAGNOSIS IN HEALTH CLINICS

TOTAL HOURS: 36 **CREDITS: 2**

1. Collection transport and processing of clinical specimens (Blood, Urine, Stool and Sputum).
Receipts, Labeling, recording and dispatching clinical specimens.
2. Isolation of bacteria in pure culture and Antibiotic sensitivity.



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B.Sc. MICROBIOLOGY (CBCS) SYLLABUS

THIRD YEAR – SEMESTER- V

PAPER-VI B: MICROBIAL BIOTECHNOLOGY (ELECTIVE)

TOTAL HOURS: 36

CREDITS: 3

UNIT- I No. of Hours: 8

Microbial biotechnology: Scope and its applications in human therapeutics, agriculture (Biofertilizers, PGPR, Mycorrhizae), environmental, and food technology. Genetically engineered microbes for industrial application: Bacteria and yeast

UNIT- II No. of Hours: 7

Recombinant microbial production processes in pharmaceutical industries - Streptokinase, recombinant vaccines (Hepatitis B vaccine). Microbial polysaccharides, polyesters and bioplastics. Microbial production of bio-pesticides Microbial biosensors

UNIT- III No. of Hours: 10

Microbial based transformation of steroids and sterols. Bio-catalytic processes and their industrial applications: Production of high fructose syrup and production of cocoa butter substitute. Immobilization methods and their application: Whole cell immobilization

UNIT- IV No. of Hours: 7

Bio-ethanol and bio-diesel production: commercial production from lignocellulosic waste and algal biomass. Biogas production: Methane and hydrogen production using microbial culture. Microorganisms in bioremediation: Degradation of xenobiotics. Mineral recovery, removal of heavy metals from aqueous effluents.

UNIT- V No. of Hours: 4

Outlines of Intellectual Property Rights: Patents, Copyrights, Trademarks

PRACTICAL-VI B: MICROBIAL BIOTECHNOLOGY

TOTAL HOURS: 36

CREDITS: 2

1. Yeast cell immobilization in calcium alginate gels



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B.Sc. MICROBIOLOGY (CBCS) SYLLABUS

THIRD YEAR – SEMESTER- VI

PAPER-VII: FOOD AND INDUSTRIAL MICROBIOLOGY

TOTAL HOURS: 36

CREDITS: 3

UNIT- I No. of hours: 8

Intrinsic and extrinsic parameters that affect microbial growth in food Microbial spoilage of food - fruits, vegetables, milk, meat, egg, bread and canned foods Food intoxication (botulism). Food-borne diseases (salmonellosis) and their detection.

▲ **UNIT – II No. of hours: 7**

Principles of food preservation - Physical and chemical methods. Fermented Dairy foods – cheese and yogurt. Microorganisms as food – SCP, edible mushrooms (white button, oyster and paddy straw). Probiotics and their benefits.

UNIT – III No. of hours: 6

Microorganisms of industrial importance – yeasts, moulds, bacteria, actinomycetes. Isolation and Screening of industrially-important microorganisms. Outlines of strain improvement.

UNIT – IV No. of hours: 8

Types of fermentation processes – solid state, liquid state, batch, fed-batch, continuous. Design of fermenter. Ingredients of Fermentation media Downstream processing - filtration, centrifugation, cell disruption, solvent extraction.

UNIT – V No. of hours: 7

Microbial production of Industrial products - Citric acid, Ethanol, amylases, penicillin, glutamic acid and vitamin B12.

PRACTICAL-VII: FOOD AND INDUSTRIAL MICROBIOLOGY



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B.Sc MICROBIOLOGY (CBCS) SYLLABUS
THIRD YEAR – SEMESTER-VI
CLUSTER ELECTIVE

PAPER-VIII-A1: COMPUTATIONAL METHODS AND BIOINFORMATICS

UNIT-I

A) Definition of statics, population and universe, the sample and population, statistical inference. Parameters and statistics. Internal data: Construction of histograms & interpretation. The normal distribution of mean, mode, median and standard deviation representing the normal curve, comparisons of means and variance.

B) Proportion data: examples of proportion data (MPN, sterility testing of medicines, animal toxicity, therapeutic, infection and immunization studies), Chi - square test, goodness of fit.

C) Count data: Examples of count data (bacteria cell count, radioactivity count, colony and plaque count) statistical treatment to count data:- Poisson distribution, standard error confidence limits of counts. (20hrs)

UNIT-II

A). Analysis of variance: Analysis of co-variance: introduction, procedure, t-Test and F-Test for multiple comparisons.

B) Correlation and regression and line fitting through graph points, standard curves, correlation, linear regression, MLR, multi-collinearity, standard curves and interpolation of unknown Y - values (15hrs)

UNIT-III

A) Computer fundamentals - organization and working of computers Basic definitions - hard ware and soft ware film ware, Program flowchart computer architecture fundamentals-internals, externals net work peripherals.

B) Introduction to windows 2000: Desktop files and folders: simple operations like creation deletion, moving, copying files or folders using window explorer. Searching files and folders and other simple operations.

UNIT-IV

A) Word processing: opening, creating and saving documents, Typing, navigating, selecting, editing and sorting, checking spelling and grammar formatting - changing appearance of page - importing graphics, working with tables, documents printing. Basis of power point

B) Use of internet and working systems.

C) Microbiology applications of special software.

UNIT-V

A) Bioinformatics: Definition concept scope and relevance of bioinformatics Applications nbr genomics, proteomics, os databases molecular modeling drug designing, gene therapy, structure and functional relationship of biomolecules and other application of bioinformatics .

B) Sequence analysis: Concepts, importance and alignment methods, comparative, multiple sequence alingsments and scoring methods.

C) Phylogenetic Analysis - concept evolution of p. trees gene predictions -methods, tools(GRAIL, Genlang, gene tindu, procrutes, Gene panges, Prot pred:- methods for knowing & unknowing folds modelling and drug designing.



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B.Sc MICROBIOLOGY (CBCS) SYLLABUS

THIRD YEAR – SEMESTER-VI

PAPER-VIII-A2 : BIOFERTILIZERS AND BIOPESTICIDES

TOTAL HOURS: 36

CREDITS: 3

UNIT – I No of Hours: 10

General account of the microbes used as biofertilizers for various crop plants and their advantages over chemical fertilizers. Symbiotic N₂ fixers: *Rhizobium* - Isolation, characteristics, types, inoculum production and field application, legume/pulses plants *Frankia* from non-legumes and characterization. Cyanobacteria from *Azolla*, characterization, mass multiplication, Role in rice cultivation, Crop response, field application.

UNIT – II No of Hours: 6

Free living *Azospirillum*, *Azotobacter* - isolation, characteristics, mass inoculum production and field application.

UNIT – III No of Hours: 6

Phosphate solubilizing microbes - Isolation, characterization, mass inoculum production, field application

UNIT – IV No of Hours: 7

Importance of mycorrhizal inoculum, types of mycorrhizae and associated plants, Mass inoculum production of VAM, field applications of Ectomycorrhizae and VAM.

UNIT – V No of Hours: 7

General account of microbes used as bioinsecticides and their advantages over synthetic pesticides. *Bacillus thuringiensis* - production, Field applications. Viruses – NPV cultivation and field applications.

PRACTICAL-VIII-A2: BIOFERTILIZERS AND BIOPESTICIDES

TOTAL HOURS: 36

CREDITS: 2

1. Isolation of *Rhizobium* from root nodules.
3. Isolation of phosphate solubilizers from soil
4. Staining and observation of VAM
3. A visit to biofertilizer production unit.

SUGGESTED READINGS

Agarwal SK (2005) **Advanced Environmental Biotechnology**, APH publication.

Kannaian, S. (2003). **Bioetchnology of Biofertilizers**, CHIPS, Texas.

Mahendra K. Rai (2005). **Hand book of Microbial biofertilizers**, The Haworth Press, Inc. New York.

Reddy, S.M. et. al. (2002). **Bioinoculants for sustainable agriculture and forestry**, Scientific Publishers.



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B.Sc MICROBIOLOGY (CBCS) SYLLABUS
THIRD YEAR – SEMESTER- VI

**PAPER-VIII-A3: MICROBIAL QUALITY CONTROL IN FOOD AND
PHARMACEUTICAL INDUSTRIES**

TOTAL HOURS: 36

CREDITS: 3

UNIT – I No. of Hours: 8

Good laboratory practices - Good microbiological practices. Biosafety cabinets – Working of biosafety cabinets, using protective clothing, specification for BSL-1, BSL-2, BSL-3. Discarding biohazardous waste – Methodology of Disinfection, Autoclaving & Incineration

UNIT – II No. of Hours: 8

Culture and microscopic methods - Standard plate count, Most probable numbers, Direct microscopic counts, Biochemical and immunological methods: Limulus lysate test for endotoxin, gel diffusion, sterility testing for pharmaceutical products

UNIT – III No. of Hours: 8

Molecular methods - Nucleic acid probes, PCR based detection, biosensors.

UNIT – IV No. of Hours: 8

Enrichment culture technique, Detection of specific microorganisms - on XLD agar, *Salmonella Shigella* Agar, *Manitol* salt agar, EMB agar, *McConkey* Agar, *Saboraud* Agar Ascertaining microbial quality of milk by MBRT, Rapid detection methods of microbiological quality of milk at milk collection centres (COB, 10 min Resazurin assay).

UNIT – V No. of Hours: 4

Hazard analysis of critical control point (HACCP) - Principles, flow diagrams, limitations
Microbial Standards for Different Foods and Water – BIS standards for common foods and drinking water.

**PRACTICAL-VIII-A3: MICROBIAL QUALITY CONTROL IN FOOD AND
PHARMACEUTICAL INDUSTRIES**

TOTAL HOURS: 36

CREDITS: 2

1. Microbiological laboratory safety- General rules & Regulations.
2. Sterility tests for Instruments – Autoclave & Hot Air Oven
3. Disinfection of selected instruments & Equipments
4. Sterility of Air and its relationship to Laboratory & Hospital sepsis.
5. Sterility testing of Microbiological media
6. Sterility testing of Pharmaceutical products –Antibiotics, Vaccines & fluids
7. Standard qualitative analysis of water.
8. Quantitative analysis of water – Membrane filter method
9. Analysis of food samples for Mycotoxins



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Core papers

Major Domain Subject: **BIO-CHEMISTRY**
SEMESTER-I

Course: **Biomolecules**

Code: **BCH-1**

60 HRS

(5 periods/week)

Unit - I: Biophysical Concepts

12 hours

Water as biological solvent, Buffers, measurement of pH, electrodes, Biological relevance of pH, pKa value, analysis of drinking water and pond water, Total dissolved salts (TDS), BOD, COD, soil analysis (texture, organic matter, elements), Electrical conductivity.

Unit - II: Carbohydrates

12 hours

Carbohydrates: Classification, monosaccharides, D and L designation, open chain and cyclic structures, epimers and anomers, mutarotation, reactions of carbohydrates (due to functional groups - hydroxyl, aldehyde and ketone. Amino sugars, Glycosides. Structure and biological importance of disaccharides (sucrose, lactose, maltose, isomaltose, trehalose), trisaccharides (raffinose, melezitose), structural polysaccharides (cellulose, chitin, pectin) and storage polysaccharides (starch, inulin, glycogen). Glycosaminoglycans, Bacterial cell wall polysaccharides. Outlines of glycoproteins, glycolipids and blood group substances.

Unit - III: Lipids

12 hours

Lipids: Classification, saturated and unsaturated fatty acids, structure and properties of fats and oils (acid, saponification and iodine values, rancidity). General properties and structures of phospholipids. Prostaglandins- structure, types and biological role. Lipoproteins- types and functions, Biomembranes-formation of micelles, bilayers, vesicles, liposomes. Membrane composition and organization - Fluid mosaic model.

Unit-IV: Amino Acids and Proteins

12 hours

Amino Acids: Classification, structure, stereochemistry, chemical reactions of amino acids due to carbonyl and amino groups. Titration curve of glycine and pK values. Essential and nonessential amino acids, non-protein amino acids. Peptide bond - nature and conformation. Naturally occurring peptides - glutathione, enkephalin.

Unit-V: Nucleic acids and porphyrins**12 hours**

Types of RNA and DNA. Structure of purines and pyrimidines, nucleosides, nucleotides. Stability and formation of phosphodiester linkages. Effect of acids, alkali and nucleases on DNA and RNA. Structure of Nucleic acids- Watson-Crick DNA double helix structure, denaturation and renaturation kinetics of nucleic acids-, T_m -values and their significance, cot curves and their significance.

Structure of porphyrins: Identification of Porphyrins, Protoporphyrin, porphobilinogen properties, Structure of metalloporphyrins–Heme, cytochromes and chlorophylls.

I Semester Practicals: Qualitative Analysis

1. Preparation of buffers (acidic, neutral and alkaline) and determination of pH.
2. Qualitative identification of carbohydrates- glucose, fructose, ribose/xylose, maltose, sucrose, lactose, starch/glycogen.
3. Qualitative identification of amino acids- histidine, tyrosine, tryptophan, cysteine, arginine.
4. Qualitative identification of lipids- solubility, saponification, acrolein test, Salkowski test, Lieberman-Burchard test.
5. Preparation of Osazones and their identification.
6. Absorption maxima of colored substances- p-Nitrophenol, Methyl orange.
7. Absorption spectra of protein-BSA, nucleic acids-Calf thymus DNA.



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Core papers

Major Domain Subject: BIO-CHEMISTRY

SEMESTER-II

Course: Analytical techniques

Code: BCH-II

60 HRS

(5 periods/week)

Unit-I: Cell homogenization and centrifugation

12 hours

Methods of tissue homogenization: (Potter-Elvehjem, mechanical blender, sonicator and enzymatic). Centrifugation techniques, principles and applications- differential, density gradient. Ultra-centrifugation- preparative and analytical.

Unit-II: Chromatographic techniques

12 hours

Types of chromatographic techniques, Principle and applications - Paper chromatography- solvents, Rf value, applications; Thin layer chromatography- principle, choice of adsorbent and solvent, Rf value, applications; Gel filtration, Ion- exchange- principle, resins, action of resins, experimental techniques, applications, separation of metal ions; Affinity chromatography.

Unit-III: Spectroscopy and tracer techniques

12 hours

Electromagnetic radiation, Beer-Lambert's law.

Colorimetry and Spectrophotometry, spectrofluorimetry, flame photometry. Tracer techniques: Radio isotopes, units of radio activity, half life, β and γ - emitters, use of radioactive isotopes in biology, ELISA, RIA.

Unit-IV: Electrophoresis

12 hours

Electrophoresis- principles and applications of paper, polyacrylamide (native and SDS) and agarose gel electrophoresis, isoelectric focusing, immune-electrophoresis-types and applications.

Unit-V: Microbial techniques:**12 hours**

Microscopy: Basic principles of light microscopy, phase contrast, electron microscope and fluorescent microscope and their applications.

Preparation of different growth media, isolation and culturing and preservation of microbes, Gram's

staining- Gram positive and Gram negative bacteria, motility and sporulation, Sterilization techniques-Physical methods, chemical methods, radiation methods, ultrasonic and. Antibiotic resistance.

Practical BCP- 201 :**Biochemical Techniques****List of Experiments:**

1. Isolation of RNA and DNA from tissue/culture.
2. Qualitative Identification of DNA, RNA and Nitrogen Bases
3. Isolation of egg albumin from egg white.
4. Isolation of cholesterol from egg yolk.
5. Isolation of starch from potatoes.
6. Isolation of casein from milk.
7. Separation of amino acids by paper chromatography.
8. Determination of exchange capacity of resin by titrimetry.
9. Separation of serum proteins by paper electrophoresis.

Recommended books:

1. Principles and Techniques of practical Biochemistry. Eds. Williams and Wilson.
2. Techniques in Molecular biology Ed. Walker & Gastra, Croom Helm, 1983.
3. Principles of instrumental analysis, 2nd Ed, Holt-Sanders, 1980.
4. An introduction to spectroscopy for Biochemistry. Ed. Brown S.N., Academic press



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Semester III

Paper-III : Enzymology and Bioenergetics

Unit-I: Classification of Enzymes and Structure 12 hours

Introduction to biocatalysis, differences between chemical and biological catalysis. Nomenclature and classification of enzymes. Enzyme specificity. Active site. Principles of energy of activation, transition state. Interaction between enzyme and substrate- lock and key, induced fit models. Definition of holo-enzyme, apo-enzyme, coenzyme, cofactor. Fundamentals of enzyme assay, enzyme units.

Unit II: Influence of Physical factors and Inhibitors on Enzyme activity. 12 hours

Factors affecting the catalysis- substrate concentration, pH , temperature. Michaelis – Menten equation for uni-substrate reaction (derivation not necessary), significance of KM and V_{max} . Enzyme inhibition- irreversible and reversible, types of reversible inhibitions- competitive and non-competitive.

Unit-III: Mechanism of enzyme action 12 hours

Outline of mechanism of enzyme action- acid-base catalysis, covalent catalysis, electrostatic catalysis, and metal ion catalysis. Regulation of enzyme activity- allosterism and cooperativity, ATCase as an allosteric enzyme, covalent modulation- covalent phosphorylation of phosphorylase, zymogen activation- activation of trypsinogen and chymotrypsinogen. Isoenzymes (LDH). Multienzyme complexes (PDH). Ribozyme.

Unit- IV: Bioenergetics 12 hours

Bioenergetics: Thermodynamic principles – Chemical equilibria; free energy, enthalpy (H), entropy (S). Free energy change in biological transformations in living systems; High energy compounds. Energy, change, oxidation-reduction reactions.

Unit V : Biological Oxidations in Mitochondria 12 hours

Organization of electron carriers and enzymes in mitochondria. Classes of electron-transferring enzymes, inhibitors of electron transport. Oxidative phosphorylation. Uncouplers and inhibitors of oxidative phosphorylation. Mechanism of oxidative phosphorylation.

Practical – 3: Enzymology

List of Experiments: 45 hrs

1. Assay of amylase
2. Assay of urease
3. Assay of catalase.



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2020-21

Core papers

Semester - IV

Paper-IV : Intermediary Metabolism

Unit- I : Carbohydrate Metabolism 12 hours

Concept of anabolism and catabolism. Glycolytic pathway, energy yield. Fate of pyruvate formation of lactate and ethanol, Pasteur effect. Citric acid cycle, regulation, energy yield, amphipathic role. Anaplerotic reactions. Glycogenolysis and glycogenesis. Pentose phosphate pathway. Gluconeogenesis. Photosynthesis- Light and Dark reactions, Calvin cycle, C4 Pathway. Disorders of carbohydrate metabolism- Diabetes Mellitus.

Unit- II : Lipid Metabolism 12 hours

Catabolism of fatty acids (β - oxidation) with even and odd number of carbon atoms, Ketogenesis, *de novo* synthesis of fatty acids, elongation of fatty acids in mitochondria and microsomes, Biosynthesis and degradation of triacylglycerol and lecithin. Biosynthesis of cholesterol. Disorders of lipid metabolism.

Unit- III: Metabolism of Amino acids 12 hours

General reactions of amino acid metabolism- transamination, decarboxylation and deamination, Urea cycle and regulation, Catabolism of carbon skeleton of amino acids- glycolytic and ketogenic amino acids. Metabolism of glycine, serine, aspartic acid, methionine, phenylalanine and leucine. Biosynthesis of creatine. Inborn errors of aromatic and branched chain amino acid metabolism.

Unit- IV: Nitrogen Fixation 12 hours

Nitrogen cycle, Non-biological and biological nitrogen fixation, Nitrogenase system. Utilization of nitrate ion, Ammonia incorporation into organic compounds. Synthesis of glutamine and regulatory mechanism of glutamine synthase.

Unit- V: Metabolism of Nucleic acid and heme: 12 hours

Biosynthesis and regulation of purine and pyrimidine nucleotides, *de novo* and salvage pathways. Catabolism of purines and pyrimidines. Biosynthesis of deoxyribo nucleotides ribonucleotide reductase and thymidylate synthase and their significance. Disorders of nucleotide metabolism- Gout, Lesch- Nyhan syndrome. Biosynthesis and degradation of heme.

Practical – 4: Quantitative Analysis

List of Experiments: 45 hrs

1. Estimation of amino acid by Ninhydrin method.



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Core papers

Biochemistry

Semester-V

Paper – V : Physiology, Clinical Biochemistry and Immunology

Unit- I: Physiology 12 hours

Digestion and absorption of carbohydrates, lipids and proteins. Composition of blood and coagulation of blood. Hemoglobin and transport of gases in blood (oxygen and CO₂). Muscle- kinds of muscles and mechanism of muscle contraction.

Unit II: Endocrinology 12 hours

Endocrinology- organization of endocrine system. Classification of hormones. Outlines of chemistry, physiological role and disorders of hormones of thyroid, parathyroid, pituitary and hypothalamus. Introduction of gastro intestinal hormones. Mechanism of hormonal action signal transduction pathways for gluco corticoids and insulin. Adrenalin, estrogen and progesterone.

Unit- III: Nutritional Biochemistry 12 hours

Balanced diet. Calorific values of foods and their determination by bomb calorimeter. BMR and factors affecting it. Specific dynamic action of foods. Energy requirements and recommended dietary allowance (RDA) for children, adults, pregnant and lactating women. Sources of complete and incomplete proteins. Biological value of proteins. Malnutrition- Kwashiorkar, Marasmus and PEM. Vitamins- sources, structure, biochemical roles, deficiency disorders of water and fat soluble vitamins. Introduction to neutraceutical and functional foods. Bulk and trace elements-Ca, Mg, Fe, I, Cu, Mo, Zn, Se and F. Obesity and starvation.

Unit- IV: Clinical Biochemistry 12 hours

Plasma proteins in health and disease. Disorders of blood coagulation (haemophilia). Types of anemias, haemoglobinopathies-sickle cell anemia. Liver diseases-jaundice. Liver function tests- conjugated and total bilirubin in serum, albumin: globulin ratio, Serum enzymes in liver diseases- SGPT, GGT and alkaline phosphatase. Kidneys-structure of nephron, urine formation, normal and abnormal constituents of urine. Biological buffers. Role of kidneys in maintaining acid-base and electrolyte balance in the body. Renal function test- creatinine.

Unit- V: Immunology 12 hours

Organization of immune system. Organs and cells of immune system. Innate and acquired immunity. Cell mediated and humoral immunity (T- and B- cells). Classification of

immunoglobulins, structure of IgG. Epitopes / antigenic determinants. Concept of haptens. Adjuvants. Monoclonal antibodies. Antigen-antibody reactions- agglutination, immunoprecipitation, immunodiffusion. Blood group antigens. Immunodiagnosics- ELISA. Vaccines and their classification. Traditional vaccines-live and attenuated. Modern vaccines- recombinant and peptide vaccines. Outlines of hypersensitivity reactions.



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Core papers

Biochemistry

SEMESTER V

Paper – VI(B) : Molecular Basis of Infectious Diseases (Elective-2)

Unit-I: Classification of infectious agents 12 hrs

Bacteria, Viruses, protozoa and fungi. Past and present emerging and re-emerging infectious diseases and pathogens. Source, reservoir and transmission of pathogens, Antigenic shift and antigenic drift. Host parasite relationship, types of infections associated with parasitic organisms. Overview of viral and bacterial pathogenesis. Infection and evasion.

Unit-II: Overview of diseases caused by bacteria 12 hrs

Detailed study of tuberculosis: History, causative agent, molecular basis of host specificity, infection and pathogenicity, Diagnostics, Therapeutics, inhibitors and vaccines. Drug resistance and implications on public health. Other bacterial diseases including Typhoid, Diphtheria, Pertussis, Tetanus and Pneumonia.

Unit –III: Overview of diseases caused by Viruses 12 hrs

Detailed study of AIDS, history, causative agent, pathogenesis, Diagnostics, Drugs and inhibitors. Other viral diseases including hepatitis, influenza, rabies, chikungunya and polio.

Unit-IV: Overview of diseases caused by Parasites 12 hrs

Detailed study of Malaria, history, causative agents, Vectors, life cycle, Host parasite interactions, Diagnostics, Drugs and Inhibitors, Resistance, Vaccine development. Other diseases including leishmaniasis, amoebiasis.

Unit-V: Overview of diseases caused by other organisms 12 hrs

Fungal diseases, General characteristics. Medical importance of major groups, pathogenesis, treatment.

Elective Practical -6B: MOLECULAR BASIS OF INFECTIOUS DISEASES 45 hrs 3 periods/ Week

List of Experiments:

Introduction to protein synthesis- Genetic code, deciphering of genetic code, Nirenberg's and Khorana's experiments, wobble hypothesis, degeneracy of genetic code.

Protein synthesis- activation of amino acids (aminoacyl t-RNA synthetases). Ribosome structure. Initiation, elongation and termination of protein synthesis. Post- translational modifications signal hypothesis. Inhibitors of protein synthesis. Regulation of prokaryotic gene expression- induction and repression. Lac operon.

Unit- V: Recombinant DNA technology 12 hours

Outlines of cloning strategies. DNA sequencing- Maxam Gilbert and Sanger's methods. Tools of r-DNA technology: Enzymes- Restriction endonucleases, ligase, phosphatases, reverse transcriptase, polynucleotide kinases, terminal transferase nucleases-S1 and RNAase H.

Restriction mapping. Cloning vectors- Plasmid, Expression vector - Host- E.coli.

Construction of c-DNA and genomic libraries. Isolation and sequencing of cloned genes- colony hybridization, nucleic acid hybridization. Polymerase chain reaction- principle and applications. Outlines of blotting techniques-Southern, Northern and Western.

Applications of gene cloning- production of insulin and human growth hormone, production of Bt cotton and edible vaccines.

Practical- 7: Microbiology and Molecular Biology 45 hrs

List of Experiments:

1. Preparation of culture media and sterilization methods.
2. Isolation of pure cultures: (i) Streak plate method. (ii) Serial dilution method.
3. Gram staining.
4. Motility of bacteria by hanging drop method.
5. Antibiotic sensitivity by paper disc method.
6. Isolation of DNA from onion/liver/coconut endosperm.
7. Estimation of DNA by diphenylamine method.
8. Estimation of RNA by orcinol method..
9. Sequence alignments of insulin/BSA with other proteins using BLAST and FASTA.
10. Examination of milk quality



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Core papers

Biochemistry

Semester – VI

Cluster Elective : VIII-A

PAPER-VIII-A1 : NUTRITIONAL BIOCHEMISTRY

Unit-I: Nutrition & Diet

- 1.1 Introduction & definition-Foods and Nutrition
- 1.2 Principle food components, balanced diet
- 1.3 Nutritional requirement & recommended dietary allowance (RDA)
- 1.4 (BMR) Basal Metabolic Rate
- 1.5 Body Composition & Energy requirements

Unit-II: Proteins in Nutrition

- 2.1 Biological value of proteins
- 2.2 Protein calorie deficiencies
- 2.3 Kwashiorkor
- 2.4 Marasmus
- 2.5 Mal Nutrition

Unit-III: Mineral Nutrients

- 3.1 Micro Nutrients
- 3.2 Macro Nutrients
- 3.3 Dietary sources deficiency and recommended dietary allowances of calcium, phosphorus
& Iron
- 3.4 Dietary sources, deficiency and recommended dietary allowance of trace elements

Unit-IV: Vitamins

- 4.1 Fat soluble vitamins
- 4.2 Vitamin B, D, E & K
- 4.3 Water soluble vitamins
- 4.4 Vitamin-B complex, Vitamin 5, Folic acid

Unit-V: Fatty Acids

- 5.1 Essential Fatty Acids
- 5.2 Energy value of fats
- 5.3 Phospholipids in Nutrition
- 5.4 Nutrition in pregnancy
- 5.5 Nutrition for Infants



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Core papers

Biochemistry

PAPER-VIII-A2 : CLINICAL BIOCHEMISTRY

UNIT – I: Basic Medical Laboratory Principles and Procedures:	10 Hours
1.1 Introduction to clinical biochemistry.	
1.2 Uses of Biochemical tests	
1.3 Specimen Collection and sample analysis, Reference values.	
1.4 Quality Control, Automation.	
UNIT – II: Clinical Biochemistry of carbohydrates, proteins & Lipids:	20 Hours
2.1 Regulation of Blood Sugar, Tests for Diabetes, Fasting Blood Glucose, PP.	
2.2 Glucose Tolerance Test, Glycosylated Hemoglobin.	
2.3 Determination of plasma proteins and its importance.	
2.4 General lipid Metabolism, functions and disorders of plasma lipoproteins.	
UNIT – III: Clinical Enzymology:	10 Hours
3.1 Plasma Enzymes in Diagnosis.	
3.2 Chemical significance, SGOT, SGPT, LDH, CK, ALP & Amylase.	
3.3 Enzymes in Diagnosis of Liver, Heart muscle disorders.	
UNIT – IV: Water & Mineral Metabolism and Acid-Base Balance:	10 Hours
4.1 Body fluid distribution (Electrolyte and water)	
4.2 Factors which influence the distribution of body water.	
4.3 Acid-Base balance in body, Acidosis and Alkalosis.	
4.4 Buffer systems in body to regulate acid-base balance.	
UNIT – V: Organ Function Tests:	10 Hours
5.1 Kidney function tests.	
5.2 Serum creatinine. Creatinine clearance.	
5.3 Liver function tests.	
5.4 Ischemic heart disease, Jaundice	
5.5 Gastric and pancreatic function tests.	
Practicals:	
1. Glucose Tolerance test.	



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Core papers
Biochemistry

Paper: VIII-A3 : MEDICAL MICROBIOLOGY

Unit –I Microbial and Human Interactions:

Normal microbial population of healthy human body - Skin, mouth, upper respiratory tract, intestinal tract, urino-genital tract, eye.

Unit –II Harmful Microbial and Human Interactions :

Entry of pathogens into the host, types of bacterial pathogens, Mechanism of bacterial pathogenicity, colonization and growth, Virulence, Virulence factors – exotoxins, enterotoxins, endotoxins, neurotoxins

Unit –III General Account of Epidemiology:

Principles of epidemiology, Current epidemics (AIDS, Nosocomical, Acute respiratory Syndrome,) Measures for prevention of epidemics –Global health consideration, Emerging and reemerging infectious diseases Biological warfare and biological weapons.

Unit –IV Person to person Microbial disease:

Names of pathogen, disease symptoms, and preventive measures airborne transmission of diseases by airborne pathogens: Streptococcal diseases, Corynebacterium Diphtheria, and Whooping cough, Mycobacterium Tuberculosis Direct contact transmission of diseases: Staphylococcus, Hepatitis viruses. Sexually transmitted diseases: Gonorrhoea and syphilis

Unit –V Animal transmitted, Artropod transmitted, Soil borne and Water borne microbial diseases:

Animal transmitted disease: Rabies Artropod transmitted disease: Malaria Soil borne diseases: Tetanus Water borne microbial diseases: Cholera, Giardiasis..

List of Experiments: Project work



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Core papers

B.Sc., Biotechnology: Choice based credit system

B.Sc., I Semester W.E.F. 2020-21

BT-101: Bio-molecules & Analytical Techniques

Course Objectives: To ensure students gain knowledge about the structure, properties and functions of biomolecules and characterization of biomolecules using analytical techniques.

Unit-I-Carbohydrates, Protein and Lipids

Classification, structure, properties of carbohydrates. Classification, structure and properties of amino acids, peptide bond and peptides. Classification, structure (primary, secondary, tertiary, quaternary) and functions of proteins. Denaturation and renaturation of proteins. Classification structure and properties of saturated and unsaturated fatty acids. Structure and functions of glycolipids, phospholipids, and cholesterol.

Unit-II- Nucleic acid, and Bioenergetics

Structure and functions of DNA and RNA. Free energy, entropy, enthalpy and redox potential. High energy compounds, Glycolysis, TCA cycle, Electron-Transport System and Oxidative Phosphorylation.

Unit-III-Centrifugation, Chromatography and Electrophoresis

Basic principles and types of centrifugations (Analytical and Preparative). Principle, instrumentation and application of paper, TLC, ion exchange, gel permeation, affinity chromatography. Basic principles and types of electrophoresis, factors affecting electrophoretic migration. PAGE (Native, SDS-PAGE). Introduction to 2D & Isoelectric Focusing, Pulsed Field Gel Electrophoresis.

Unit - IV-Spectroscopy, Microscopy and Laser Techniques

Beer-Lambert law, light absorption and transmission. Extinction coefficient, Design and application of photoelectric colorimeter and UV-visible spectrophotometer. Introduction to crystallography and application. Types and design of microscopes - compound, phase contrast, fluorescent electron microscopy (TEM, SEM). Introduction to radioisotopes, measurement of radioactivity (scintillation counter and autoradiography). Pros and Cons of usage of radioactive material in life sciences.

Unit –V- Biostatistics

Mean, median, mode, standard deviation, One-way Anova, t-test, F-test and chi-square.

List of Practicals:-

1. Introduction to basic instruments (Principle standard operation procedure) demonstration and record
2. Calculation of molarity, normality and molecular weight of compounds.
3. Qualitative analysis of carbohydrates (sugars)
4. Quantitative analysis of carbohydrates
5. Quantitative estimation of protein - Lowery method
6. Estimation of DNA by diphenylamine reagent
7. Estimation of RNA by orcinol reagent
8. Preparation of standard buffer and pH determination
9. Separation of amino acids by paper chromatography

Unit-IV- DNA Replication, Repair and Regulation of Gene Expression

DNA replication in prokaryotes (semiconservative, dispersive, conservative, uni and bi-direction, rolling circle). Mechanism of DNA replication, enzymes and protein involved in DNA replication. DNA damage and repair. Regulation of gene expression in prokaryotes Lac and Trip operon concept.

Unit – V - Central Dogma of Molecular Biology

Genome organization of prokaryotic and eukaryotic organisms. Genetic code, prokaryotic transcription, enzymes involved in transcription. Post-transcriptional modification (Capping Poly adenylation) and splicing.

Translation: mechanism of translation in prokaryotic organisms.

List of Practicals:-

1. Cleaning and preparation of glassware
2. Preparation of nutrient agar medium for bacteria
3. Preparation of PDA medium for fungi
4. Sterilization techniques (autoclave, hot air oven, filter)
5. Isolation of bacteria from soil
6. Simple staining technique
7. Differential staining technique
8. Microbial counting by Haemocytometer
9. Identification of different bacteria
10. Motility test by hanging drop
11. Preparation of pure culture by slab, slant, streak culture
12. Study of stages of mitotic cell division



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Core papers

B.Sc., SEMESTER III

PAPER- III: BIOPHYSICAL TECHNIQUES

UNIT – I

Spectrophotometry: Spectrum of light, absorption of electromagnetic radiations, Beer's law - derivation and deviations, extinction coefficient. Instrumentation of Colorimeter; UV and visible spectrophotometry, Double beam spectrometer; dual-wavelength spectrometer, Applications of UV and visible spectrophotometry.

UNIT II:

Chromatography: Partition principle, partition coefficient, nature of partition forces, brief account of paper chromatography. Thin layer chromatography and column chromatography. Gel filtration: Principle, instrumentation and applications. Ionexchange chromatography: Principle, instrumentation and applications. Affinity chromatography: Principle, instrumentation and applications. HPLC

UNIT III

Electrophoresis: Migration of ions in electric field, Factors affecting electrophoretic mobility. Gel electrophoresis: - Types of gels, SDS-PAGE Electrophoresis and applications. Agarose gel electrophoresis, applications. Isoelectric focusing. Pulsed-field gel electrophoresis.

UNIT – IV:

Isotopic tracer technique: Radioactive & stable isotopes, rate of radioactive decay. Units of radioactivity. Concept of measurement of radioactivity, Cerenkov radiation. Measurement of

Stable isotopes: Falling drop method for deuterium measurement, Principles of tracer technique, advantages and limitations, applications of isotopes in biotechnology

UNIT V:

Centrifugation: Basic principles, concept of RCF, types of centrifuges (clinical, high speed and ultracentrifuges). Preparative centrifugation: Differential and density gradient centrifugation, applications (Isolation of cell components). Analytical centrifugation: Sedimentation coefficient, determination of molecular weight by sedimentation velocity and sedimentation equilibrium methods.

Biostatistics Basic concepts of mean, median, mode, Standard deviation and Standard error. Introduction to ANOVA

Reference books:

1. Wilson, K. & Walker, J., 2000. Practical Biochemistry.
2. Biophysical chemistry – **Upadhyay**, Himalaya Publication edition 3, 2005.
3. Fundamentals Of Biostatistics by Khan (Author), Khanum Ukaaz Publications.Hyderabad.

PRACTICAL-III: BIOPHYSICAL TECHNIQUES LAB

1. Spectrophotometric analysis of DNA denaturation.
 2. Determination of absorption spectrum of oxy- and deoxyhemoglobin and methemoglobin.
 3. Protein estimation by E280/E260 method.
 4. Paper chromatography of amino acids/sugars.
 5. TLC of sugars/amino acids.
 6. Cellular fractionation and separation of cell organelles using centrifuge.
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2020-21

Core papers

B. Sc. SEMESTER IV

PAPER-IV: IMMUNOLOGY

UNIT I

Immune system: History and introduction to immunology; Organs and cells of immune system; Immunity- types; innate immune mechanism, Acquired immune mechanism.

UNIT II

Antibody and Antigen: Antibody structure and classes, Antibody diversity, Types of Antigens, Antigenicity (factors affecting antigenicity), haptens. Complement system.

UNIT III

Immunity: Cell mediated immunity: TC mediated immunity, NK cell mediated immunity, ADCC, brief description of cytokines and MHC (MHC types and diversity), Primary and secondary immune response; Humoral immunity

UNIT IV

Hypersensitivity and vaccination : General features of hypersensitivity, various types of hypersensitivity, Autoimmunity – any two diseases as examples; Vaccination: Discovery, principles, significance, Types of Vaccines.

UNIT V

Immunological Techniques: Antigen-antibody reactions: Precipitation, agglutination, complement fixation, immunodiffusion, ELISA. Hybridoma technology: Monoclonal antibodies and their applications in immunodiagnosis.

References:

1. Immunology by J.Kubey (1993) Freeman and company
2. Essential immunology, Ivan Riott. 2000. Blackwell Science, 9th Edition
3. The Elements of Immunology by Fahim Halim Khan (2009) Pearson Education Limited

PRACTICAL-IV: IMMUNOLOGY LAB

1. Antigen – antibody reaction – determination of Blood group, Cross reactivity
2. Pregnancy test
3. Widal test
4. Ouchterlony immunodiffusion
5. Radial immunodiffusion
6. ELISA
7. Isolation of casein by isoelectric precipitation
8. Production of antibodies and their titration

Note: - Mandatory to perform atleast 6 practicals



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Core papers

B. Sc. III – Semester V

PAPER-VI(A) : rDNA TECHNOLOGY (Elective Theory)

Unit I:

Restriction and Modification. Classification of restriction endonucleases. Enzymes used in molecular cloning: Polymerases, ligases, phosphatases, kinases and nucleases, reverse transcriptase and terminal transferase.

Unit II

Cutting and joining DNA (cohesive end ligation, methods of blunt end ligation). Transfection and transformation. Selection of transformed cells. Screening methods (Genetic marker and blue white screening)

Unit III: **Cloning vehicles** - Plasmid, Bacteriophage, Construction of genomic and cDNA libraries. Advantages of cDNA libraries.

Unit IV:

Methods of gene sequencing – Maxam - Gilberts and Sanger's dideoxy chain termination methods; Polymerase chain reaction technique (Components in PCR and PCR conditions)

Methods of gene transfer in fungi, yeast and higher plants using microinjection, microprojectile bombardment (gene gun method, Electroporation and Agrobacterium mediated transformation

Unit V:

Applications of recombinant DNA technology in Agriculture (Transgenic Plants) Medicine (production of Insulin, Growth hormone, Tissue plasmogen activator and HBsAg vaccine)

References:

1. Principles of Gene Manipulation and Genomics - Primrose, S.B. and Twyman, R.M. 2006. 7th Edition. Blackwell Publishing Company
2. A Text Book of Biotechnology. R.C. Dubey. S.Chand & Co Ltd, New Delhi.
3. Gene Cloning: An introduction by T. A. Brown (1986) 3rd Edition G Chapman & Hall



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Core papers

PAPER-VI(B) : GENETICS (Elective Theory)

UNIT I

Mendel's Laws and Inheritance: Mendel experiments, Mendel Laws and deviations: incomplete dominance and Co dominance Penetration and pleiotropism, Recessive and Dominant epistatic gene interactions. Concept of multiple alleles.

UNIT II

Genes and their variations: Structure of gene, gene and environment, gene copies of prokaryotic and Eukaryotic chromosomes. Eukaryotic chromosome organization, histone proteins.

Unit III:

Gene mutations: Mutagenesis - Spontaneous and induced (Chemical and physical) mutations; Natural and induction of mutations, point mutations, frameshift mutations, auxotrophic conditional and suppressor mutations.

UNIT IV:

DNA Damage and DNA Repair: Factors affecting DNA damage; Light induced repair, Excision repair and mismatch repair, Post replication repair, Rec gene and its role in DNA repair, SOS repair and SOS response

Unit V:

Transposable elements: Structure and Molecular basis of AC-DS transposition in maize, "P" element of Drosophila and hybrid dysgenesis, Yeast "T7" elements, Retroposans

References:

1. Principles of Genetics – E.J.Gardener, M.J.Simmons and D.P.Snustad, John Wiley & Sons Publications.
2. Molecular Biology of the Cell – Alberts. Garland publication, edition 4, 2002.
3. Genetics by P. K. Gupta (2014) Rastogi Publications



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Core papers

B. Sc. III – Semester VI

PAPER-VII : PLANT AND ANIMAL BIOTECHNOLOGY

UNIT I:

Cell and tissue culture:

Introduction to Plant Biotechnology: Principles of plant cell and tissue culture – totipotency, dedifferentiation, redifferentiation; Introduction to cell and Tissue culture Laboratory facilities; Types of media (Eg. MS Media & its composition), Preparation and sterilization.

UNIT II:

Tissue and micropropagation: Somatic embryogenesis and organogenesis; Clonal Propagation of economically important plants (Banana), Production of secondary metabolites through plant tissue culture, Methods in the production of transgenic plants, Bt Cotton, Golden rice.

UNIT III:

Various techniques of animal cell and tissue culture: Basic laboratory facilities of animal cell culture laboratory, Culture media, growth factors. Characteristics of cells in culture: Contact inhibition, anchorage dependence, cell-cell communication etc.; Cell senescence; cell and tissue response to trophic factors. Primary culture, immortal cells, cell lines. d) Maintenance of cell lines in the laboratory.

UNIT IV:

Gene transfer methods in animals: Transgenesis, transgenic methods – microinjection, electroporation, lipofection, embryonic stem cell mediated-, retroviral mediated-.Artificial insemination, In Vitro Fertilization, Embryo transfer in farm animals.Production of Dolly..

UNIT V:

IPR: Intellectual property rights- patent, copyright, trademark etcSocial, ethical and legal issues in Biotechnology.

References:

1. Introduction to Plant Biotechnology Chawla,(2003) (2nd edn) Oxford and IBH Publishers
2. A Text Book of Biotechnology. R.C. Dubey. S.Chand& Co Ltd, New Delhi.
3. Biotechnology, Satyanarayana. U, 2008, Books and Allied (p) Ltd.
4. Basic Biotechnology, S. Ignachimuthu. 1995. Tata McGraw Hill Publishers, New



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Core papers



PAPER-VIII-A2 : INDUSTRIAL BIOTECHNOLOGY

Unit I:

Isolation, Screening, Preservation and Improvement of Industrially Important Microorganisms. Synthetic and Natural Medium, Precursors, Antifoams, Sterilization Methods and Inoculum Preparation.

Unit II:

Definition of bioreactor, basic principles of bioreactor. Classification of bioreactors.

Analysis of batch, continuous, fed batch and semi-continuous bioreactors.

Unit III:

Ethanol Production by Fermentation using Molasses, Starchy Substances. Production of Alcoholic Beverages like Beer and Wine. Production of Citric Acid by Submerged and Solid State Fermentations.

Unit IV:

Sources of Industrial Enzymes, Production of Microbial Enzymes like Amylase and protease. Baker's Yeast and SCP Production. Production of Antibiotics: Penicillin.

Unit V:

Biotechnology Products- Production of recombinant proteins having therapeutic and diagnostic applications (Insulin, Growth Hormone, Recombinant vaccines, Monoclonal Antibody).

References:

1. Industrial Microbiology by L.E Casida, John Wiley and sons INC
2. Industrial microbiology by A.H.Patel, Macillan India Ltd.



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Core papers

PAPER-VIII-A3 : MEDICAL BIOTECHNOLOGY

UNIT- I

Human Genetics and Human Genome: History and development of human Genome Project; organization of the human genome. – chromosome and gene organization -Inherited human diseases-single gene diseases,complex traits.

UNIT- II

Gene Therapy: Identification and isolation of defective genes ,Cancer causes and genetics – Genetic Counselling.

Infectious Diseases: Classification: fungal, protozoal, helminthic, bacterial and viral;
Hospital-acquired infections (nosocomial), Sexually transmitted Diseases.

Unit -III

Immunology, Vaccines and Transplantation Technology
Antigens and Antibodies –Acquired and Innate Immunity, Immune system, Immune diseases,Allergy. Immunity to infections by viruses, bacteria, fungi and parasites. Blood groups. Monoclonal antibodies.

Unit -IV

Embryonic Stem cells: Culture & Therapy. Artificial Blood. Aminocentosis. Biochemical and Molecular Diagnostics (PCR, ELISA, FISH, Microarray etc).Drug delivery methods

UNIT- V

Social, Ethical and Legal Issues in Medical Biotechnology
IPR : patents and copyrights. Human cloning. Pre-natal sex determination and foeticide.
Clinical Trials introduction.



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Core papers



CBCS / Semester System (w.e.f. 2020-'21 Admitted Batch)

I Semester /Botany Core Course - 1

Fundamentals of Microbes and Non-vascular Plants

(Viruses, Bacteria, Fungi, Lichens, Algae and Bryophytes)

(Total hours of teaching – 60 @ 04 Hrs./Week)

Theory:

Learning Outcomes:

On successful completion of this course, the students will be able to:

- Explain origin of life on the earth.
- Illustrate diversity among the viruses and prokaryotic organisms and can categorize them.
- Classify fungi, lichens, algae and bryophytes based on their structure, reproduction and life cycles.
- Analyze and ascertain the plant disease symptoms due to viruses, bacteria and fungi.
- Recall and explain the evolutionary trends among amphibians of plant kingdom for their shift to land habitat.
- Evaluate the ecological and economic value of microbes, thallophytes and bryophytes.

Unit – 1: Origin of life and Viruses

12Hrs.

1. Origin of life, concept of primary Abiogenesis; Miller and Urey experiment. Five kingdom classification of R.H. Whittaker
2. Discovery of microorganisms, Pasteur experiments, germ theory of diseases.
3. Shape and symmetry of viruses; structure of TMV and Gemini virus; multiplication of TMV; A brief account of Prions and Viroids.
4. A general account on symptoms of plant diseases caused by Viruses.
5. Significance of viruses in vaccine production, bio-pesticides and as cloning vectors.

Unit – 2: Special groups of Bacteria and Eubacteria **12Hrs.**

1. Brief account of Archaeobacteria, Actinomycetes and Cyanobacteria.
2. Cell structure of Eubacteria.
3. Reproduction- Asexual (Binary fission and endospores) and bacterial recombination (Conjugation, Transformation, Transduction).
4. Economic importance of Bacteria with reference to their role in Agriculture and industry (fermentation and medicine).
5. A general account on symptoms of plant diseases caused by Bacteria; Citrus canker.

Unit – 3: Fungi & Lichens **12 Hrs.**

1. General characteristics of fungi and Ainsworth classification (upto classes).
2. Structure, reproduction and life history of (a) *Rhizopus* (Zygomycota) and (b) *Puccinia* (Basidiomycota).
3. Economic uses of fungi in food industry, pharmacy and agriculture.
4. A general account on symptoms of plant diseases caused by Fungi; Blast of Rice.
5. Lichens- structure and reproduction; ecological and economic importance.

Unit – 4: Algae **12 Hrs.**

1. General characteristics of Algae (pigments, flagella and reserve food material); Fritsch classification (upto classes).
2. Thallus organization in Algae.
3. Occurrence, structure, reproduction and life cycle of (a) *Spirogyra* (Chlorophyceae) and (b) *Polysiphonia* (Rhodophyceae).
4. Economic importance of Algae.

Unit – 5: Bryophytes **12 Hrs.**

1. General characteristics of Bryophytes; classification upto classes.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life cycle of (a) *Marchantia* (Hepaticopsida) and (b) *Funaria* (Bryopsida).
3. General account on evolution of sporophytes in Bryophyta.



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2020-21

Core papers

II Semester /Botany Core Course – 2

Basics of Vascular plants and Phytogeography

(Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography)

(Total hours of teaching – 60 @ 02 Hrs./Week)

Theory:

Learning Outcomes:

On successful completion of this course, the students will be able to:

- Classify and compare Pteridophytes and Gymnosperms based on their morphology, anatomy, reproduction and life cycles.
 - Justify evolutionary trends in tracheophytes to adapt for land habitat.
 - Explain the process of fossilization and compare the characteristics of extinct and extant plants.
 - Critically understand various taxonomical aids for identification of Angiosperms.
 - Analyze the morphology of the most common Angiosperm plants of their localities and recognize their families.
 - Evaluate the ecological, ethnic and economic value of different tracheophytes and summarize their goods and services for human welfare.
 - Locate different phytogeographical regions of the world and India and can analyze their floristic wealth.
-

Unit – 1: Pteridophytes

12 Hrs.

1. General characteristics of Pteridophyta; classification of Smith (1955) into divisions.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life history of (a) *Lycopodium* (Lycopsidea) and (b) *Marsilea* (Filicopsida).
3. Steady evolution in Pteridophytes;
4. Heterospory and seed habit.

Unit – 2:Gymnosperms**14 Hrs.**

1. General characteristics of Gymnosperms; Sporneclassification upto classes.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life history of (a) *Cycas*(Cycadopsida) and (b) *Gnetum* (Gnetopsida).
3. Outlines of geological time scale.
4. A brief account on *Cycadeoidea*.

Unit – 3:Basic aspects of Taxonomy**13Hrs.**

1. Aim and scope of taxonomy; Species concept: Taxonomic hierarchy, species, genus and family.
2. Plant nomenclature: Binomial system, ICBN- rules for nomenclature.
3. Herbarium and its techniques,BSI herbarium and Kew herbarium; concept of digital herbaria.
4. Types of classification; Bentham and Hooker system of classification,
5. Systematic description and economic importance of the following families:
(a) Annonaceae (b) Curcubitaceae

Unit – 4: Systematic Taxonomy**13 Hrs.**

1. Systematic description and economic importance of the following families:
(a) Asteraceae (b) Asclepiadaceae (c)Amaranthaceae(d) Euphorbiaceae
(e) Arecaceae (f) Poaceae
2. Outlines of Angiosperm Phylogeny Group (APG IV).

Unit – 5:Phytogeography**08 Hrs.**

1. Principles of Phytogeography, Distribution (wides, endemic, discontinuous species)
2. Endemism – types and causes.
3. Phytogeographic regions of World.
4. Phytogeographic regions of India.
5. Vegetation types in Andhra Pradesh.



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2020-21

Core papers



II B. Sc - SEMESTER –III: BOTANY THEORY PAPER –III

Paper-III : Plant Taxonomy and Embryology)

Total hours of teaching 60hrs @ 4 hrs per week

UNIT – I: INTRODUCTION TO PLANT TAXONOMY (12hrs)

1. Fundamental components of taxonomy (identification, nomenclature, classification)
2. Taxonomic resources: Herbarium- functions & important herbaria, Botanical gardens, Flora.
3. Botanical Nomenclature- Principles and rules of ICBN (ranks and names; principle of priority, binomial system; type method, author citation, valid-publication).

UNIT – II: CLASSIFICATION

(12 hrs)

1. Types of classification- Artificial, Natural and Phylogenetic.
2. Bentham & Hooker's system of classification- merits and demerits.
3. Engler & Prantle's system of classification- merits and demerits
4. Phylogeny – origin and evolution of Angiosperms

UNIT –III: SYSTEMATIC TAXONOMY-I

(12hrs)

1. Systematic study and economic importance of the following families:
Annonaceae, Brassicaceae, Rutaceae, Curcubitaceae, and Apiaceae.

UNIT –IV: SYSTEMATIC TAXONOMY-II

(12hrs)

1. Systematic study and economic importance of plants belonging to the following families: Asteraceae, Asclepiadaceae, Lamiaceae, Euphorbiaceae, Arecaceae, and Poaceae.

UNIT – V: EMBRYOLOGY

(12hrs)

1. Anther structure, microsporogenesis and development of male gametophyte.
2. Ovule structure and types; Megasporogenesis, development of Monosporic, Bisporic and Tetrasporic types (*Peperomia*, *Drusa*, *Adoxa*) of embryo sacs.
3. Pollination and Fertilization (out lines) Endosperm development and types.
4. Development of Dicot and Monocot embryos, Polyembryony.

Books for Reference:

1. Porter, C.L. (): Taxonomy of flowering Plants, Eurasia Publishing House, New Delhi.
2. Lawrence, G.H.M. (1953): Taxonomy of Vascular Plants, Oxford & IBH Publishers, New Delhi, Calcutta.
3. Jefferey, C.(1968) : An Introduction to Plant Taxonomy J.A. Churchill, London.
4. Mathur, R.C.(1970) : Systematic Botany (Angiosperms) Agra Book Stores- Lucknow, Ajmer, Allahabad, Delhi.
5. Maheswari,P(1963) :Recent Advances in the Embryology of Angiosperms(Ed.,) International Society of Plant Morphologists- University of Delhi.
6. Swamy. B.G.L. & Krishnamoorthy. K.V.(1980):From flower to fruit
Tata McGraw Hill Publishing Co., Ltd., New Delhi.
7. Maheswari, P.(1985):An Introduction to the Embryology of Angiosperms
Tata McGraw Hill Publishing Co.,Ltd., New Delhi.
8. Bhojwani, S.S. & Bhatnagar, S.P. (2000) : The Embryology of Angiosperms (4th Edition) Vikas Publishing House(P)Ltd., UBS Publisher's Distributors, New Delhi.



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2020-21

Core papers

B.Sc. BOTANY, SEMESTER- IV, Paper-IV: THEORY SYLLABUS

14

PAPER –IV: Plant Physiology and Metabolism

Total hours of teaching 60hrs @ 4 hrs per week

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- ▲ **UNIT – I: Plant – Water relations** (12 hrs)
1. Physical properties of water, Importance of water to plant life.
 2. Diffusion, imbibition and osmosis; concept & components of Water potential.
 3. Absorption and transport of water and ascent of sap.
 4. Transpiration –Definition, types of transpiration, structure and opening and closing mechanism of stomata.
- UNIT –II: Mineral nutrition & Enzymes** (12hrs)
1. Mineral Nutrition: Essential elements (macro and micronutrients) and their role in plant metabolism, deficiency symptoms.
 2. Mineral ion uptake (active and passive transport).
 3. Nitrogen metabolism- biological nitrogen fixation in *Rhizobium*, outlines of protein synthesis (transcription and translation).
 4. Enzymes: General characteristics, mechanism of enzyme action and factors regulating enzyme action.
- UNIT –III: PHOTOSYNTHESIS** (12 hrs)
1. Photosynthesis: Photosynthetic pigments, photosynthetic light reactions, photo-phosphorylation, carbon assimilation pathways: C₃, C₄, and CAM (brief account)
 2. Photorespiration and its significance.
 3. Translocation of organic solutes: mechanism of phloem transport, source-sink relationships.
- UNIT – IV: PLANT METABOLISM** (12 hrs)
1. Respiration: Glycolysis, anaerobic respiration, TCA cycle, electron transport system. Mechanism of oxidative phosphorylation.
 2. Lipid Metabolism: Types of lipids, Beta-oxidation.
- UNIT –V: GROWTH AND DEVELOPMENT** (12hrs)
1. Growth and development: definition, phases and kinetics of growth.

2. Physiological effects of phytohormones - Auxins, Gibberellins, Cytokinins, ABA and Ethylene.
3. Physiology of flowering -photoperiodism, role of phytochrome in flowering; Vernalization.

Suggested activity: Seminars, Quiz, Debate, Question and Answer sessions, observing animations of protein biosynthesis in you tube.

Books for Reference:

1. Steward, F.C (1964): Plants at Work (A summary of Plant Physiology) Addison-Wesley Publishing Co., Inc. Reading, Massachusetts, Palo alto, London.
2. Devlin, R.M. (1969): Plant Physiology, Holt, Rinehart & Winston & Affiliated East West Press (P) Ltd., New Delhi .
3. Noggle, R.& Fritz (1989):Introductory Plant Physiology Prentice Hall of India.
4. Lawlor,D.W. (1989): Photosynthesis, metabolism, Control & Physiology ELBS/Longmans-London.
5. Mayer, Anderson & Bonning(1965): Introduction to Plant Physiology D. Van Nostrand Publishing Co., N.Y.
6. Mukherjee, S. A.K. Ghosh(1998) Plant Physiology ,Tata McGraw Hill Publishers(P) Ltd., New Delhi.
7. Salisbury, F.B & C.W. Ross (1999): Plant Physiology CBS Publishers and Printers, New Delhi.
7. Plummer, D.(1989) Biochemistry–the Chemistry of life ,McGraw Hill Book Co., London, N.Y. New Delhi, Paris, Singapore, Tokyo.
- 9.Day, P.M.& Harborne, J.B. (Eds.) (2000): Plant Biochemistry, Harcourt Asia (P) Ltd., India & Academic Press, Singapore.



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2020-21

Core papers

III B. Sc - SEMESTER- V: BOTANY SYLLABUS THEORY PAPER – V

Paper-V: Cell Biology, Genetics and Plant Breeding

Total hours of teaching 60 hrs @ 3 hrs per week

UNIT – I Cell Biology:

(12hrs)

1. Cell, the unit of life- Cell theory, Prokaryotic and eukaryotic cells; Eukaryotic cell components.
2. Ultra structure and functions of cell wall and cell membranes.
3. Chromosomes: morphology, organization of DNA in a chromosome (nucleosome model), Euchromatin and heterochromatin.

UNIT – II Genetic Material:

(12hrs)

1. DNA as the genetic material: Griffith's and Avery's transformation experiment, Hershey – Chase bacteriophage experiment.
2. DNA structure (Watson & Crick model) and replication of DNA (semi-conservative)
3. Types of RNA (mRNA, tRNA, rRNA), their structure and function.

UNIT – III Mendelian Inheritance:

(12 hrs)

1. Mendel's laws of Inheritance (Mono- and Di- hybrid crosses); backcross and test cross.
2. Chromosome theory of Inheritance.
3. Linkage: concept, complete and incomplete linkage, coupling and repulsion; linkage maps based on two and three factor crosses.
4. Crossing Over: concept & significance.

UNIT – IV Plant Breeding:

(12 hrs)

1. Introduction and Objectives of plant breeding.
2. Methods of crop improvement: Procedure, advantages and limitations of Introduction, Selection, and Hybridization (outlines only).

UNIT – V Breeding, Crop Improvement and Biotechnology:

(12 hrs)

1. Role of mutations in crop improvement.
2. Role of somaclonal variations in crop improvement.
3. Molecular breeding – use of DNA markers in plant breeding and crop improvement (RAPD, RFLP).

Suggested activity: Seminar, Debate, Quiz, observation of live cells and nucleus in Onion peels, observation of Meiotic nuclei in Maize pollen. Solving Genetics problems.



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2020-21

III B. Sc - SEMESTER- V: BOTANY THEORY SYLLABUS
PAPER-VI: PLANT ECOLOGY & PHYTOGEOGRAPHY

Total hours of teaching 60 hrs @ 3 hrs per week

UNIT – I. Elements of Ecology (12 hrs)

1. Ecology: definition, branches and significance of ecology.
2. Climatic Factors: Light, Temperature, precipitation.
3. Edaphic Factor: Origin, formation, composition and soil profile.
4. Biotic Factor: Interactions between plants and animals.

UNIT– II. Ecosystem Ecology (12 hrs)

1. Ecosystem: Concept and components, energy flow, Food chain, Food web, Ecological pyramids.
2. Productivity of ecosystem-Primary, Secondary and Net productivity.
3. Biogeochemical cycles- Carbon, Nitrogen and Phosphorous.

UNIT – II Population & Community Ecology (12 hrs)

1. Population -definition, characteristics and importance, outlines –ecotypes.
2. Plant communities- characters of a community, outlines – Frequency, density, cover, life forms, competition.
3. Interaction between plants growing in a community.

UNIT – IV Phytogeography (12 hrs)

1. Principles of Phytogeography, Distribution (wides, endemic, discontinuous species)
2. Phytogeographic regions of India.
3. Phytogeographic regions of World.
4. Endemism – types and causes

UNIT- V: Plant Biodiversity and its importance (12 hrs)

1. Definition, levels of biodiversity-genetic, species and ecosystem.
2. Biodiversity hotspots- Criteria, Biodiversity hotspots of India.
3. Loss of biodiversity – causes and conservation (*In-situ* and *ex-situ* methods).
4. Seed banks - conservation of genetic resources and their importance

Suggested activity -Collection of different soils, studying their texture, observing polluted water bodies, student study projects, debates on man's activity on ecosystem and biodiversity conservation methods, visiting a nearest natural vegetation area. Visit to NGO, working in the field of biodiversity and report writing; to study Honey Bees and plants yielding honey.

III B. Sc - BOTANY SYLLABUS SEMESTER- VI
Paper VII: Plant tissue culture and its biotechnological applications

Total hours of teaching 60hrs @ 3hrs per week

Unit I: PLANT TISSUE CULTURE – 1

(12hrs)

1. History of plant tissue culture research - basic principles of plant tissue callus culture, meristem culture, organ culture, Totipotency of cells, differentiation and dedifferentiation.
2. Methodology - sterilization (physical and chemical methods), culture media, Murashige and Skoog's (MS medium), phytohormones, medium for micro-propagation/clonal propagation of ornamental and horticulturally important plants.
3. Callus subculture maintenance, growth measurements, morphogenesis in callus culture – organogenesis, somatic embryogenesis.

UNIT-II: Plant Tissue culture -2

(12hrs)

1. Endosperm culture – Embryo culture -culture requirements – applications, embryo rescue technique.
2. Production of secondary metabolites.
3. Cryopreservation; Germ plasm conservation.

Unit III: Recombinant DNA technology

(12hrs)

1. Restriction Endonucleases (history, types I-IV, biological role and application); concepts of restriction mapping.
2. Cloning Vectors: Prokaryotic(pUC 18, pBR322, Ti plasmid and Lambda phage, Eukaryotic Vectors (YAC and briefly PAC)
3. Gene cloning (Bacterial Transformation and selection of recombinant clones, PCR mediated gene cloning)
4. Construction of genomic and cDNA libraries, screening DNA libraries to obtain gene of interest by complementation technique, colony hybridization.

Unit IV: Methods of gene transfer

(12hrs)

1. Methods of gene transfer- Agrobacterium-mediated, direct gene transfer by Electroporation, Microinjection, Micro projectile bombardment.
2. Selection of transgenics– selectable marker and reporter genes (Luciferase, GUS, GFP).

Unit V: Applications of Biotechnology

(12 hrs)

1. Applications of Plant Genetic Engineering – crop improvement, herbicide resistance, insect resistance, virus resistance.
2. Genetic modification – transgenic plants for pest resistant (Bt-cotton); herbicide resistance (Round Up Ready soybean); improved agronomic traits - flavr Savr tomato, Golden rice); Improved horticultural varieties(Moon dust carnations)

III B.Sc.: BOTANY SYLLABUS SEMESTER- VI
Cluster Electives, CLUSTER–A CLUSTER ELECTIVE, PAPER–VIII-A1

Paper VIII-A1: Biological instrumentation and Methodology

Total hours of teaching 60hrs @ 3hrs per week

Unit -I: Imaging and related techniques: (12hrs)

Principles of microscopy; Light microscopy; Fluorescence microscopy; Electron Microscopy
(a) Flow cytometry (b) Applications of fluorescence microscopy:

Unit- II: pH and Centrifugation: (12 hrs)

pH meter: Principles and instrumentation, Centrifugation: Principles, types of centrifuges, types of rotors, differential and density gradient centrifugation, application.

Unit- III: Spectrophotometry: (12hrs)

Principle involved in Spectrophotometer; Spectrophotometric techniques, Instrumentation: ultraviolet and visible spectrophotometry (single and double beam, double wavelength spectrophotometers), Infrared spectrometers.

Unit- IV: Chromatography: (12hrs)

Chromatographic techniques: Principle and applications – Column - thin layer –paper, affinity and gas chromatography - Gel filtration - Ion exchange and High performance liquid chromatography techniques– Examples of application for each chromatographic system - Basic principles of electrophoresis.

Unit-V: Preparation of molar, molal and normal solutions, buffers, the art of scientific writing (12hrs)

Understanding the details on the label of reagent bottles. Molarity and normality of common acids and bases. Preparation of solutions. Dilutions. Percentage solutions. Molar, molal and normal solutions.

Technique of handling micropipettes; Knowledge about common toxic chemicals and safety measures in their handling. The art of scientific writing and presentation of scientific matter. Scientific writing and ethics. Writing references. Powerpoint presentation. Poster presentation. Introduction to copyright-academic misconduct/plagiarism in scientific writing.

III B.Sc.: BOTANY SYLLABUS SEMESTER- VI PAPER – VIII-A2

Paper VIII-A2: Mushroom Culture and Technology

Total hours of teaching 60hrs @ 3hrs per week

Unit I: Introduction, history: (12hrs)

Introduction - history - scope of edible mushroom cultivation, Types of edible mushrooms available in India – *Volvariella volvacea*, *Pleurotus citrinopileatus*, *Agaricus bisporus*. Nutritional and medicinal value of edible mushrooms; Poisonous mushrooms.

UNIT II: Pure culture-spawn preparation: (12hrs)

Pure culture - preparation of medium (PDA and Oatmeal agar medium) sterilization - preparation of test tube slants to store mother culture – culturing of *Pleurotus* mycelium on Petriplates, preparation of mother spawn in saline bottle and polypropylene bag and their multiplication.

Unit III: Cultivation Technology: (12hrs)

Infrastructure: Substrates (locally available) Polythene bags, vessels, Inoculation hook, inoculation loop, low cost stove, sieves, culture rack, mushroom unit (Thatched house) water sprayer, tray, small polythene bag.

Mushroom bed preparation - paddy straw, sugarcane trash, maize straw, banana leaves. Factors affecting the mushroom bed preparation - Low cost technology, composting technology in mushroom production.

Unit IV: Storage and nutrition : (12hrs)

Short-term storage (Refrigeration - up to 24 hours) Long term Storage (canning, pickles, papads), drying, storage in salt solutions. Nutrition - Proteins - amino acids, mineral elements nutrition - Carbohydrates, Crude fibre content – Vitamins.

Unit V: Food Preparation: (12hrs)

Types of foods prepared from mushrooms; soup, cutlet, omelette, samosa, pickles and curry. Research Centres - National level and Regional level. Cost benefit ratio - Marketing in India and abroad, Export Value.

Suggested activities: Growing spawn on laboratory prepared medium in petriplates and maintaining, preparing compost and compost beds, packing of beds, spawning, maintaining moisture, picking, blanching and packing. Collecting naturally growing mushrooms and identifying



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2020-21

Core papers

Electronics

B.Sc. Electronics Syllabus under CBCS
w.e.f. 2020-21 (revised in June 2020)

SEMESTER-1

PAPER – I

CIRCUIT THEORY AND ELECTRONIC DEVICES

Objectives:

- To explain the basic concepts and laws of DC and AC electrical networks and solve them using mesh and nodal analysis techniques.
- To analyze circuits in time and frequency domain.
- To synthesize the networks using passive elements.
- To understand the construction, working and VI characteristics of electronic devices.
- To understand the concept of power supply.

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UNIT- 1: (12Hrs)

SINUSOIDAL ALTERNATING WAVEFORMS:

Definition of current and voltage. The sine wave, general format of sine wave for voltage or current, phase relations, average value, effective (R.M.S) values. Differences between A.C and D.C. Phase relation of R, L and C

UNIT-II: (12hrs)

PASSIVE NETWORKS AND NETWORKS THEOREMS (D.C):

Branch current method, Nodal Analysis, star to delta & delta to star conversions. Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power, Milliman and Reciprocity theorems.

UNIT-III: (12hrs)

RC, RL AND RLC CIRCUITS:

Frequency response of RC and RL circuits, their action as low pass and high pass filters. Passive differentiating and integrating circuits. Series resonance and parallel resonance circuits, Q – Factor.

UNIT-IV: (12hrs)

BJT, FET and UJT:

BJT: Construction, working, and characteristics of CE Configurations. Hybrid parameters and hybrid equivalent circuit of CE Transistor,

FET: Construction, working and characteristics of JFET and MOSFET. Advantages of FET over BJT.

UJT: Construction, working and characteristics of UJT. UJT as a Relaxation oscillator.

UNIT-V:(12hrs)

POWER SUPPLIES & PHOTO ELECTRIC DEVICES

Rectifiers: Half wave, full wave rectifiers-Efficiency-ripple factor- Filters- L-section & π -section filters. Three terminal fixed voltage I.C. regulators(78XX and & 79XX). Light Emitting Diode – Photo diode and LDR.



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2020-21

Core papers

Electronics

B.Sc. Electronics Syllabus under CBCS
w.e.f. 2020-21 (revised in June 2020)

SEMESTER – II

PAPER – 2

Digital Electronics

Objectives:

- To understand the number systems, Binary codes and Complements.
- To understand the Boolean algebra and simplification of Boolean expressions.
- To analyze logic processes and implement logical operations using combinational logic circuits.
- To understand the concepts of sequential circuits and to analyze sequential systems in terms of state machines.
- To understand characteristics of memory and their classification.
- To implement combinational and sequential circuits using VHDL.

Unit – I (12hrs)

NUMBER SYSTEM AND CODES: Decimal, Binary, Hexadecimal, Octal. Codes: BCD, Gray and Excess-3 codes- code conversions- Complements (1's, 2's, 9's and 10's), Addition - Subtraction using complement methods.

Unit- II (12hrs)

BOOLEAN ALGEBRA AND THEOREMS: Boolean Theorems, De-Morgan's laws. Digital logic gates, Multi level NAND & NOR gates. Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh Map Method: 2,3 variables).

Unit-III (12hrs)

COMBINATIONAL DIGITAL CIRCUITS:

Adders-Half & full adder, Subtractor-Half and full subtractors, Parallel binary adder, Magnitude Comparator, Multiplexers (4:1) and Demultiplexers (1:4), Encoder (8-line-to-3-line) and Decoder (3-line-to-8-line). IC-LOGIC FAMILIES: TTL logic, CMOS Logic families (NAND&NOR Gates).

UNIT-IV (12hrs)

SEQUENTIAL DIGITAL CIRCUITS:

Flip Flops: S-R FF, J-K FF, T and D type FFs, Master-Slave FFs, Excitation tables, Registers:-Serial In Serial Out and Parallel In and Parallel Out, Counters Asynchronous-Mod-8, Mod-10, Synchronous-4-bit & Ring counter.

UNIT-IV (12hrs)

SEQUENTIAL DIGITAL CIRCUITS:

Flip Flops: S-R FF, J-K FF, T and D type FFs, Master-Slave FFs, Excitation tables, Registers:-Serial In Serial Out and Parallel In and Parallel Out, Counters Asynchronous-Mod-8, Mod-10, Synchronous-4-bit & Ring counter.

UNIT-(12hrs)

MEMORY DEVICES:

General Memory Operations, ROM, RAM (Static and Dynamic), PROM, EPROM, EEPROM, EAROM,



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2020-21

Core papers

Electronics

B.Sc. Electronics Syllabus under CBCS

w.e.f. 2015-16 (revised in April 2016)

SEMESTER – III

PAPER – 3

Digital Electronics

Unit – I (9hrs)

NUMBER SYSTEM AND CODES: Decimal, Binary, Hexadecimal, Octal, BCD, Conversions, Complements (1's, 2's, 9's and 10's), Addition, Subtraction, Gray, Excess-3 Code conversion from one to another.

Unit- II (12hrs)

BOOLEAN ALGEBRA AND THEOREMS: Boolean Theorems, De-Morgan's laws. Digital logic gates, Multi level NAND & NOR gates. Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh Map Method: 4,5 variables), don't care condition.

Unit-III (15hrs)

COMBINATIONAL DIGITAL CIRCUITS:

Adders-Half & full adder, Subtractor-Half and full subtractors, Parallel binary adder, Magnitude Comparator, Multiplexers (2:1,4:1) and Demultiplexers (1:2,4:1), Encoder

(8-line-to-3-line) and Decoder (3-line-to-8-line). IC-LOGIC FAMILIES: TTL logic, DTL logic, RTL Logic, CMOS Logic families (NAND&NOR Gates), Bi-CMOS inverter

UNIT-IV (14hrs)

SEQUENTIAL DIGITAL CIRCUITS:

Flip Flops: S-R FF, J-K FF, T and D type FFs, Master-Slave FFs, Excitation tables, Registers:-shift left register, shift right register, Counters - Asynchronous-Mod16,Mod-10,Mod-8,Down counter,,Synchronous-4-bit &Ring counter.

UNIT-V (10hrs)

MEMORY DEVICES:

General Memory Operations, ROM, RAM (Static and Dynamic), PROM, EPROM, EEPROM, EAROM, PLA(Programmable logic Array),PAL(Programmable Array Logic)

TEXT BOOKS:

1. M.Morris Mano, "Digital Design" 3rd Edition, PHI, New Delhi.
2. Ronald J. Tocci, "Digital Systems-Principles and Applications" 6/e. PHI. New Delhi.



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2020-21

Core papers

Electronics

B.Sc. Electronics Syllabus under CBCS

SEMESTER – IV

PAPER – 4

Analog and Digital ic - applications

(Operational – Amplifiers)

Unit – I (10hrs)

OPERATIONAL AMPLIFIERS: Definition, Basic op-amp Ideal op-amp, Block diagram of op-amp, inverting, noninverting, virtualground, Adders, subtractors, summing amplifier, voltage follower, op-amp parameters, voltage to current convertor, integrator, differentiator, differential amplifier, Logarithmic amplifier.

Unit- II (15 hrs)

OP-AMP CIRCUITS: voltage regulator, comparator, zerocross detecting circuit, instrumentational amplifier, multivibrators-astable, monostable, Bi-stable, Schmitt trigger. sine wave generator, square wave generator, triangular wave generator, Active filters(Basics)-low pass, high pass, band pass filters
IC-555 –functional block diagram and mention it's applications

Unit-III (15hrs):

COMBINATIONAL & SEQUENTIAL LOGIC CIRCUITS (IC-Applications):

Design of Code convertor: BCD to Seven Segment ,BCD to Grey, Grey to Binary.

Design of Counters using State Machine: Mod N counter, Preset Table Binary Up/Down

Counter. Design of Universal Shift Register

UNIT-IV (10hrs)

DATA CONVERTERS:

A/D converter:- Successive Approximation ADC,-Single slope and dual slope converter, Sigma-delta ADC, D/A converter: R-2R Ladder network, Binary Weighted .

UNIT-V (10hrs)

DIGITAL SYSTEM INTERFACING AND APPLICATIONS: interfacing of LED's

Applications of Counters: Digital Clock

Applications of Shift Registers: Parallel to Serial ,Serial to Parallel, UART

TEXT BOOKS:

1. G K Kharate-Digital electronics-oxford university press
2. M.Morris Mano, “ Digital Design “ 3rd Edition, PHI, New Delhi.
3. Op Amp and Linear Integrated Circuits By Ramakant Gaykwad
4. Linear Integrated Circuits By Roy Choudary

Reference Books :

1. Jacob Millan ,Micro Electronics ,McGraw Hill.
2. Mithal G K, Electronic Devices and Circuits Thana Publishers.
3. Allan Motter shead ,Electronic Devices and Circuits – An Introduction- Prentice Hall



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Core papers

Electronics

B.Sc. Electronics CBCS Syllabus

3RD YEAR

Semester - V

Paper- V

TITLE: ANALOG AND DIGITAL COMMUNICATIONS

OBJECTIVES:

- This course provides a thorough introduction to the basic principles and techniques used in analog and digital communications.
- The course will introduce analog and digital modulation techniques.
- Communication receiver and transmitter design, baseband and band pass communication techniques, line coding techniques, noise analysis, and multiplexing techniques.
- The course also introduces analytical techniques to evaluate the performance of communication systems.

UNIT –I (10Hrs) AMPLITUDE MODULATION:

Need for modulation, amplitude modulation-frequency spectrum of AM wave, representation of AM, power relations in the AM wave. Generation of AM- Transistor modulators.

Suppression of carrier, balanced modulator, suppression of one side band- the filter method, phase shift method.

UNIT –II (10Hrs) FREQUENCY MODULATION:

Theory of FM, mathematical representation of FM, frequency spectrum of FM wave, narrow band FM, wide band FM, power contents of the carrier and sidebands, Generation of FM signals – Reactance modulator.

UNIT –III (10Hrs) BASIC RECEIVER CIRCUITS:

Noise – Thermal, Shot, Noise figure, Super heterodyne Receiver block diagram, FM receiver, discriminators- slope, balanced slope, phase discriminator & Ratio detector

UNIT –IV (12Hrs) RADIO WAVE PROPAGATION:

Communication bands, Electromagnetic waves, propagation of waves - ground waves, Ionosphere & Space waves. **PULSE MODULATION:** Introduction, Sampling Theorem, TDM, FDM, PAM- Generation & Detection PWM- Generation & Detection, PPM- Generation & Detection

UNIT –V (18Hrs) DIGITAL COMMUNICATIONS:

PCM – PCM encoders, Quantization noise, S/N ratio of PCM system, relation between S/N ratio & BW, Companding. Advantages of digital over analog communications. Advantages of shift keying over digital communication, Types of shift keying, ASK – Generation & Detection, FSK – Generation & Detection, PSK – Generation & Detection.

TEXT BOOKS:

1. Electronic Communications - George Kennedy
2. Antennas and Wave Propagation – G.S.N.Raju – PHI
3. Principles of communication system –Herbert Taub & D.L.Schilling

▲ **REFERENCES:**

1. Electronic Communications – Roody & Colen



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Core papers

Electronics

B.Sc. Electronics CBCS Syllabus

3RD YEAR

Semester-V

Paper- V

TITLE: MICROPROCESSOR SYSTEMS

OBJECTIVES:

- To understand basic architecture of 16 bit and 32 bit microprocessors.
- To understand interfacing of 16 bit microprocessor with memory and peripheral chips involving system design.
- To understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors
- To understand RISC based microprocessors.
- To understand concept of multi core processors.

▲ **UNIT -I: (15Hrs)**

CPU ARCHITECTURE

Introduction to Microprocessor, INTEL -8085(P) Architecture, CPU, ALU unit, Register organization, Address, data and control Buses. Pin configuration of 8085, 8086 Architecture, Evaluation of Microprocessor, Internal operation, Pin description. Instruction format, Machine language instructions, Instruction Execution timing, Addressing modes

UNIT -II: (10 Hrs)

INSTRUCTION SET:

Data transfer Instruction, Logical Instructions, Arithmetic Instructions, Branch Instructions, Flag Manipulation, Shift and rotate Instruction, Loop Instruction

UNIT -III: (15Hrs)

Assembly Language Programming, Programmes for Addition, Subtraction, Multiplication, Find the largest and smallest number in an array. **Modular programming:**—Linking and Relocation, Stacks, Procedures, Interrupts And Interrupt Routines.

UNIT -IV: (10Hrs)

Basic 8086 Configurations – Minimum mode and Maximum Mode, Interrupt Priority Management I/O Interfaces: Serial Communication interfaces, Parallel Communication, Programmable Timers, Keyboard and display, DMA controller

UNIT -V: (10Hrs)

ARM PROCESSOR

Introduction to 16/32 bit processors, Arm architecture & organization, Arm based MCUs, Programming model, Instruction



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2020-21

Core papers

Electronics

B.Sc. Electronics CBCS Syllabus

3RD YEAR

VI SEMESTER

PAPER-VII: MICRO CONTROLLER AND INTERFACING

OBJECTIVES:

- To understand the concepts of microcontroller based system.
- To enable design and programming of microcontroller based system.
- To know about the interfacing Circuits.

UNIT-I: (10Hrs) Introduction, comparison of Microprocessor and micro controller, Evolution of microcontrollers from 4-bit to 32 bit. Development tools for micro controllers, Assembler-Compiler-Simulator/Debugger.

UNIT -II: (10Hrs)

Microcontroller Architecture: Overview and block diagram of 8051, Architecture of 8051, program counter and memory organization, Data types and directives, PSW register, Register banks and stack, pin diagram of 8051, Port organization, Interrupts and timers.

UNIT-III:(10Hrs)

Addressing modes, instruction set of 8051: Addressing modes and accessing memory using various addressing modes, instruction set: Arithmetic, Logical, Simple bit, jump, loop and call instructions and their usage. Time delay generation and calculation, Timer/Counter Programming,

Unit -IV: (15Hrs)

Assemble language programming Examples: Addition, Multiplication, Subtraction, division, arranging a given set of numbers in largest/smallest order.

UNIT-V: (15Hrs)

Interfacing and Application of Microcontroller: Interfacing of – PPI 8255, DAC (0804), Temperature measurement (LM35), interfacing seven segment displays, displaying information on a LCD, control of a stepper Motor (Uni-Polar), Interfacing a 4*3 matrix keypad. Generation of different types of waveforms using DAC.



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Core papers

Electronics

3RD YEAR
VI SEMESTER

Cluster-1

PAPER- VIII (A1): EMBEDDED SYSTEMS DESIGN

TITLE: Embedded Systems Design

OBJECTIVES:

design embedded computer system hardware
design, implement, and debug multi-threaded application software that operates under real-time constraints on embedded computer systems
use and describe the implementation of a real-time operating system on an embedded computer system
formulate an embedded computer system design problem including multiple constraints, create a design that satisfies the constraints, implement the design in hardware and software, and measure performance against the design constraints
create computer software and hardware implementations that operate according to well-known standards
organize and write design documents and project reports
organize and make technical presentations that describe a design.

UNIT 1: (10Hrs)

Introduction to Embedded Systems:

Embedded systems overview, Design Challenge, Processor Technology, IC Technology, and Design Technology.

UNIT 2: (15Hrs)

Custom Single Purpose Processor – Hardware Development:

Introduction, Combinational logic, Sequential logic, Custom Single Purpose Processor Design, RT-Level Custom Single-Purpose Processor.

UNIT 3: (15Hrs)

General Purpose Processor – Software Development:

Introduction, Basic Architecture, Operation, Programmer's View, ASIPs, and Development Environment: Host and Target Machines, Linker / Locators for Embedded Software, Getting Embedded Software into the target system. Debugging Techniques: Testing on your Host Machine, and Instruction Set Simulators.

UNIT 4: (10Hrs)

RTWA for Embedded Systems:

Introduction, Timers, Counters and Watchdog Timers, UART, Pulse Width Modulators, LCD Controllers, Keypad Controllers, Stepper Motor Controllers, Analog – to – Digital Converters, and Real Time Clocks.

UNIT 5: (10Hrs)

Advanced Communication Principles:

Parallel Communication, Serial Communication, Wireless Communication, Serial Protocols: I²C, CAN, FireWire, and USB. Parallel Protocols: PCI BUS and ARM BUS. Wireless Protocols: IrDA, Bluetooth, and IEEE 802.11.

TEXT BOOKS:

1. Embedded System Design – A Unified Hardware / Software Introduction By Frank Vahi Tony Givargis – WILEY EDITION.

2. Embedded Systems Architecture, Programming and Design – 2nd Edition By Raj Kama Tata McGraw-Hill Education.

REFERENCES:

An Embedded Software Premier - David E- Siman, PEARSON Education

Embedded / real - time systems - DR. K.V.K.K. Prasad, dreamtech

The art of programming Embedded systems, Jack G. Ganssle, academic press

Intelligent Embedded systems, Louis L. Odette, Adison Wesly, 1991



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Core papers

Electronics

B.Sc. Electronics CBCS

SYLLABUS 3rd YEAR

VI SEMESTER

PAPER- VIII (A2)

ELECTRONIC INSTRUMENTATION

Sub: ELECTRONICS		Year:2017-18	Group: B.Sc	Credits -3
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TITLE: ELECTRONIC

INSTRUMENTATION OBJECTIVES:

The student will be introduced to

To introduce students to monitor, analyze and control any physical system

To understand students how different types of meters work and their construction

- To Study of absolute is merely confirmed within laboratories To Study integrating instruments like ammeter, voltmeter To Measurement of impedance using bridges To Study of PLL ,ph-meter, PLC

UNIT-I (10hrs)

Measurements:

Basic block diagram of measurement system, Accuracy and precision, resolution, sensitivity, linearity, Errors, systematic and random errors, standards & calibrations of an instrument.

Applications of instrument

UNIT –II (10hrs)

Basic Measurement Instruments: DC measurement-ammeter, voltmeter, ohm meter, AC measurement, Digital voltmeter systems (integrating and non-

integrating). Digital Multimeter; Block diagram principle of measurement of I, V, C. Accuracy and resolution of measurement.

Measurement of Impedance- A.C. bridges, Measurement of Self Inductance (Anderson's bridge), Measurement of Capacitance (De Sauty bridge), Measurement of frequency (Wien's bridge).

UNIT-III (15hrs)

Lock-in-amplifier: Basic Principles of phase locked loop (PLL), Phase detector (XOR& edge triggered), Voltage Controlled Oscillator (Basics, varactor), lock and capture. Basic idea of PLL IC (565 or 4046). Lock-in-amplifier , Idea of techniques for sum and averaging of signals.

Signal Generators: Function generator, Pulse Generator, (Qualitative only).

UNIT-IV (15hrs)

Analytical instruments

Spectrophotometer, working with block diagram, features of spectrophotometer,

P_H meter - principle working with block diagram, features of P_H meter.

TEMPERATURE TRANSDUCERS

Standards and calibration, Fluid expansion and metal expansion type transducers, like bimetallic strip, Thermometer, RTD, Thermo couple and their characteristics.

UNIT-V : (10hrs)

Direct digital control (DDC), Distributed control system (DCS),

PLC'S: Block diagram, hardware, PLC operation, basic logic program (ladder logic), Applications of PLC'S

TEXT BOOKS

1,Introduction to instrumentation and control By A.K.Ghosh 2.Sensors and transducers PHI 2Ed By D.Patranabis.



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Core papers

Electronics

3rd YEAR

VI SEMESTER

Cluster-I

PAPER- VIII (A3)

CONSUMER ELECTRONICS

Unit – I(12hrs)

MICROWAVE OVENS – Microwaves (Range used in Microwave ovens) – Microwave oven block diagram – LCD timer with alarm – Single-Chip Controllers – types of Microwave oven – Wiring and Safety instructions – care and Cleaning.

Unit – II(12hrs)

WASHING MACHINES – Electronic controller for washing machines – Washing machine hardware and software – Types of washing machines – Fuzzy logic washing machines Features of washing machines.

Unit – III(12hrs)

AIR CONDITIONERS AND REFRIGERATORS – Air Conditioning – Components of air conditioning systems – All water air conditioning systems – All air conditioning systems – Unitary and central air conditioning systems – Split air conditioners.

Unit – IV(12hrs)

HOME/OFFICE DIGITAL DEVICES – Fascimile machine – Xerographic copier – calculators – Structure of a calculator – Internal organization of a calculator – Servicing electronic calculators – Digital clocks – Block diagram of a digital clock.

Unit – V(12hrs)

DIGITAL ACCESS DEVICES – Digital computer – Internet access – online ticket reservation – functions and networks – barcode scanner and decoder – Electronic Fund Transfer – Automated Teller Machines(ATMs) – Set-Top boxes – Digital cable TV – Video on demand.

TEXTBOOKS:

1. S.P. Bali, Consumer Electronics – Pearson Education, New Delhi, 2005.
2. R.G. Gupta Audio and Video systems Tata McGraw Hill (2004)

ELECTRONICS LAB

CONSUMER ELECTRONICS LAB



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2020-21

Core papers

B.Sc. PHYSICS SYLLABUS UNDER CBCS

For Mathematics Combinations

[2020-21 Batch onwards]

I Year B.Sc.-Physics:I Semester

Course I: MECHANICS, WAVES AND OSCILLATIONS

Work load:60 hrs per semester

4 hrs/week

Course outcomes:

On successful completion of this course, the students will be able to:

- *Understand Newton's laws of motion and motion of variable mass system and its application to rocket motion and the concepts of impact parameter, scattering cross section.*
- *Apply the rotational kinematic relations, the principle and working of gyroscope and its applications and the precessional motion of a freely rotating symmetric top.*
- *Comprehend the general characteristics of central forces and the application of Kepler's laws to describe the motion of planets and satellite in circular orbit through the study of law of Gravitation.*
- *Understand postulates of Special theory of relativity and its consequences such as length contraction, time dilation, relativistic mass and mass-energy equivalence.*
- *Examine phenomena of simple harmonic motion and the distinction between undamped, damped and forced oscillations and the concepts of resonance and quality factor with reference to damped harmonic oscillator.*
- *Appreciate the formulation of the problem of coupled oscillations and solve them to obtain normal modes of oscillation and their frequencies in simple mechanical*

UNIT-I:

1. Mechanics of Particles (5 hrs)

Review of Newton's Laws of Motion, Motion of variable mass system, Motion of a rocket, Multistage rocket, Concept of impact parameter, scattering cross-section, Rutherford scattering-Derivation.

2. Mechanics of Rigid bodies (7 hrs)

Rigid body, rotational kinematic relations, Equation of motion for a rotating body, Angular momentum and Moment of inertia tensor, Euler equations, Precession of a spinning top, Gyroscope.

Unit-II:

3. Motion in a Central Force Field (12hrs)

Central forces, definition and examples, characteristics of central forces, conservative nature of central forces, Equation of motion under a central force, Kepler's laws of planetary motion-Proofs, Motion of satellites, Basic idea of Global Positioning System (GPS), weightlessness, Physiological effects of astronauts

UNIT-III:

4. Relativistic Mechanics (12hrs)

Introduction to relativity, Frames of reference, Galilean transformations, absolute frames, Postulates of Special theory of relativity, Lorentz transformation, time dilation, length contraction, variation of mass with velocity, Einstein's mass-energy relation

Unit-IV:

5. Undamped, Damped and Forced oscillations: (012 hrs)

Simple harmonic oscillator and solution of the differential equation, Damped harmonic oscillator, Forced harmonic oscillator – Their differential equations and solutions, Resonance, Logarithmic decrement, Relaxation time and Quality factor.

Unit-V:

6. Vibrating Strings: (07 hrs)

Transverse wave propagation along a stretched string, General solution of wave equation and its significance, Modes of vibration of stretched string clamped at ends, Overtone.

7. Ultrasonics: (05 hrs)

Ultrasonics, General Properties of ultrasonic waves, Production of ultrasonics by piezoelectric and magnetostriction methods, Detection of ultrasonics, Applications of ultrasonic waves,



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2020-21

B.Sc. PHYSICS SYLLABUS UNDER CBCS

For Mathematics Combinations

[2020-21 Batch onwards]

I Year B.Sc.-Physics: II Semester

Course-II: WAVE OPTICS

Work load:60 hrs per semester

4 hrs/week

Course outcomes:

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

- ❖ *Understand the phenomenon of interference of light and its formation in (i) Lloyd's single mirror due to division of wave front and (ii) Thin films, Newton's rings and Michelson interferometer due to division of amplitude.*
- ❖ *Distinguish between Fresnel's diffraction and Fraunhofer diffraction and observe the diffraction patterns in the case of single slit and the diffraction grating.*
- ❖ *Describe the construction and working of zone plate and make the comparison of zone plate with convex lens.*
- ❖ *Explain the various methods of production of plane, circularly and polarized light and their detection and the concept of optical activity..*
- ❖ *Comprehend the basic principle of laser, the working of He-Ne laser and Ruby lasers and their applications in different fields.*
- ❖ *Explain about the different aberrations in lenses and discuss the methods of*

UNIT-I Interference of light: (12hrs)Introduction, Conditions for interference of light, Interference of light by division of wave front and amplitude,Phase change on reflection-Interference in thin films: wedge- shaped films, colours in thin films, Newton's rings in reflected light-Theory and experiment,

Determination of wavelength of monochromatic light, Michelson interferometer and determination of wavelength.

UNIT-II Diffraction of light:(12hrs)

Introduction, Types of diffraction: Fresnel and Fraunhofer diffractions, Distinction between Fresnel and Fraunhofer diffraction, Fraunhofer diffraction at a single slit, Plane diffraction grating, Determination of wavelength of light using diffraction grating. Fresnel's half period zones, Zone plate, comparison of zone plate with convex lens.

UNIT-III Polarisation of light:(12hrs)

Polarized light: Methods of production of plane polarized light, Double refraction, Brewster's law, Malus law, Nicol prism, Nicol prism as polarizer and analyzer, Quarter wave plate, Half wave plate, Plane, Circularly and Elliptically polarized light-Production and detection, Optical activity, Basic principle of LCDs.

UNIT-IV Aberrations and Fibre Optics:

(12hrs)

Monochromatic aberrations, Spherical aberration, Methods of minimizing spherical aberration, Coma, Astigmatism and Curvature of field, Distortion; Chromatic aberration-the achromatic doublet; Achromatism for two lenses (i) in contact and (ii) separated by a distance.

Fibre optics: Introduction to Fibers, different types of fibers, rays and modes in an optical fiber, Principles of fiber communication (qualitative treatment only), Advantages of fiber optic communication.

UNIT-V Lasers and Holography:(12hrs)

Lasers: Introduction, Spontaneous emission, stimulated emission, Population Inversion, Laser principle. Types of lasers-He-Ne laser, Ruby laser, Applications of lasers; Holography: Basic principle of holography, Applications of holography

REFERENCE BOOKS:

- BSc Physics, Vol.2, Telugu Akademy, Hyderabad
- A Text Book of Optics-N Subramanvam. I. Briilal. S.Chand& Co.



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2020-21

**Paper III: Wave Optics
(For Maths Combinations)
III SEMESTER**

Work load:60 hrs per semester

4 hrs/week

UNIT-I (8 hrs)

1. Aberrations:

Introduction – monochromatic aberrations - spherical aberration, coma, astigmatism, curvature of field and distortion- explanation and methods of elimination, Chromatic aberration - the achromatic doublet. Achromatism for two lenses (i) in contact and (ii) separated by a distance.

UNIT-II (14hrs)

2. Interference

Principle of superposition, coherence, conditions for interference of light. Fresnel's biprism-determination of wavelength of light, change of phase on reflection. Oblique incidence of a plane wave on a thin film due to reflected light (cosine law), colors of thin films, Interference by a film with two non-parallel reflecting surfaces (Wedge shaped film) - Determination of diameter of wire, Newton's rings in reflected light. Michelson interferometer - Determination of wavelength of monochromatic light using Newton's rings and Michelson Interferometer.

UNIT-III (14hrs)

3. Diffraction

Introduction distinction between Fresnel and Fraunhofer diffraction, Fraunhofer diffraction –Diffraction due to (i) single slit, (ii) double slit and (iii) N slits (diffraction grating), Resolving power of grating, Determination of wavelength of light in normal incidence and minimum deviation methods using diffraction grating.

Fresnel's half period zones - area of the half period zones, zone plate – construction and theory, comparison of zone plate with convex lens - difference between interference and diffraction.

UNIT-IV(10 hrs)

4.Polarisation:

Polarized light: methods of polarization polarization by reflection, refraction, double refraction, scattering of light, Brewster's law, Malus law, Nicol prism - polarizer and analyzer, Quarter wave plate, Half wave plate, optical activity- determination of specific rotation by Laurent's half shade polarimeter, Babinet's compensator.

UNIT-V (14hrs)

5. Lasers :

Lasers: introduction, spontaneous emission, stimulated emission. Population inversion, Laser principle, Einstein coefficients, Types of lasers - He-Ne laser and Ruby laser, Applications of lasers.

6. Fiber Optics

Introduction- different types of fibers, rays and modes in an optical fiber, fiber material, principles of fiber communication (qualitative treatment only), advantages of

6. Fiber Optics

Introduction- different types of fibers, rays and modes in an optical fiber, fiber material, principles of fiber communication (qualitative treatment only), advantages of fiber optic communication.

REFERENCE BOOKS:

1. BSc Physics, Vol.2, Telugu Akademy, Hyderabad
2. A Text Book of Optics-N Subramanyam, L Brijlal, S.Chand & Co.
3. Unified Physics Vol.II Optics & Thermodynamics – Jai Prakash Nath & Co.Ltd., Meerut
4. Optics F. A. Jenkins and H.G. White, Mc Graw-Hill
5. Optics, Ajoy Ghatak Tata Mc Graw-Hill.
6. Introduction of Lasers – Avadhanulu, S Chand & Co.
7. Principles of Optics- BK Mathur, Gopala Printing Press, 1995

Practical Paper III: Wave Optics

Work load:30 hrs

2 hrs/week

Minimum of 6 experiments to be done and recorded

1. Determination of radius of curvature of a given convex lens-Newton's rings.
2. Resolving power of grating.
3. Study of optical rotation –polarimeter.
4. Dispersive power of a prism.
5. Determination of wavelength of light using diffraction grating-minimum deviation method.
6. Determination of wavelength of light using diffraction grating-normal incidence method.
7. Resolving power of a telescope.
8. Refractive index of a liquid-hallow prism
9. Determination of thickness of a thin wire by wedge method
10. Determination of refractive index of liquid-Boy's method.

Suggested student activities

Student seminars, group discussions, assignments, field trips, study project and experimentation using virtual lab

Examples

Seminars - A topic from any of the Units is given to the student and asked to give a brief seminar presentation.

Group discussion - A topic from one of the units is given to a group of students and asked to discuss and debate on it.

Assignment - Few problems may be given to the students from the different units and asked them to solve.

Field trip - Visit to Satish Dhawan Space Centre, Sriharikota / Thermal and hydroelectric power stations / Science Centres, any other such visit etc.

Study project - Web based study of different satellites and applications.



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2020-21

**Paper IV: Thermodynamics & Radiation Physics
(For Maths Combinations)
IV SEMESTER**

Work load: 60 hrs per semester

4 hrs/week

UNIT-I (10 hrs)

1. Kinetic theory of gases

Introduction, Deduction of Maxwell's law of distribution of molecular speeds, experimental verification. Transport phenomena - Viscosity of gases - thermal conductivity and diffusion of gases.

UNIT-II(12 hrs)

2. Thermodynamics

Introduction, Isothermal and adiabatic processes, Reversible and irreversible processes, Carnot's engine and its efficiency, Carnot's theorem, Second law of thermodynamics - Kelvin's and Clausius statements, Entropy - physical significance - Change in entropy in reversible and irreversible processes, Entropy of Universe, Temperature-Entropy (T-S) diagram and its uses - Change of entropy of a perfect gas.

UNIT-III(12 hrs)

3. Thermodynamic potentials and Maxwell's equations

Thermodynamic potentials, Derivation of Maxwell's thermodynamic relations, Clausius-Clayperon's equation, Derivation for ratio of specific heats, Derivation for difference of two specific heats for perfect gas, Joule Kelvin effect - expression for Joule Kelvin coefficient for perfect and Vander waal's gas.

UNIT-IV(12 hrs)

4. Low temperature Physics

Introduction, Joule Kelvin effect - Porous plug experiment, Joule expansion, Distinction between adiabatic and Joule Thomson expansion, Expression for Joule Thomson cooling, Liquefaction of helium, Kapitza's method, Adiabatic demagnetization- Production of low temperatures, applications of substances at low temperature.

UNIT-V(14 hrs)

5. Quantum theory of radiation

Blackbody-Ferry's black body, distribution of energy in the spectrum of black body, Wein's law, Rayleigh-Jean's law, Quantum theory of radiation- Planck's law, Types of pyrometers- Disappearing filament optical pyrometer - experimental determination, Angstrom pyroheliometer - determination of solar constant, Temperature of Sun.

REFERENCE BOOKS:

1. BSc Physics, Vol.2, Telugu Akademy, Hyderabad
2. Thermodynamics, R.C.Srivastava, S.K.Saha & Abhay K.Jain Eastern Economy Edition.
3. Unified Physics Vol.2, Optics & Thermodynamics, Jai Prakash Nath & Co.Ltd., Meerut

Practical Paper IV: Thermodynamics & Radiation Physics

Work load: 30 hrs

2 hrs/week

Minimum of 6 experiments to be done and recorded

1. Specific heat of a liquid –Joule’s calorimeter –Barton’s radiation correction
2. Thermal conductivity of bad conductor-Lee’s method
3. Thermal conductivity of rubber.
4. Measurement of Stefan’s constant.
5. Specific heat of a liquid by applying Newton’s law of cooling correction.
6. Heating efficiency of electrical kettle with varying voltages.
7. ~~Thermoemf~~- thermo couple - potentiometer
8. Thermal behavior of an electric bulb (filament/torch light bulb)
9. Measurement of Stefan’s constant- emissive method
10. Study of variation of resistance with temperature - thermistor.

Suggested student activities

Student seminars, group discussions, assignments, field trips, study project and experimentation using virtual lab

Examples

Seminars - A topic from any of the Units is given to the student and asked to give a brief seminar presentation.

Group discussion - A topic from one of the units is given to a group of students and asked to discuss and debate on it.

Assignment - Few problems may be given to the students from the different units and asked them to solve.

Field trip - Visit to Satish Dhawan Space Centre, ~~Sriharikota~~ / Thermal and hydroelectric power stations / Science Centres. any other such visit etc.

Study project - Web based study of different satellites and applications.

Domain skills:

Logical derivation, experimentation, problem solving, data collection and analysis, measurement skills

*** Documental evidence is to be maintained for the above activities.

UNIT-I :

1. Atomic and Molecular Physics:(12 hrs)

Vector atom model and Stern-Gerlach experiment, Quantum numbers associated with it, Angular momentum of the atom, Coupling schemes, Zeeman effect, Experimental arrangement to study Zeeman effect; Raman effect, Characteristics of Raman effect,

nano materials: (*Fuel cells, Phosphors for HD TV, Next Generation Computer chips, elimination of pollutants, sensors*)

5. Superconductivity:

(5 hrs)

Introduction to Superconductivity, Experimental results-critical temperature, critical magnetic field, Meissner effect , Isotope effect, Type I and Type II superconductors, BCS theory (elementary ideas only), Applications of superconductors

B.Sc. PHYSICS SYLLABUS UNDER CBCS

For Mathematics Combinations

Paper V: Electricity, Magnetism & Electronics
(For Maths Combinations)
V Semester

Work load: 60 hrs per semester

4 hrs/week

UNIT-I (12 hrs)

1. Electric field intensity and potential:

Gauss's law statement and its proof- Electric field intensity due to (1) Uniformly charged sphere and (2) an infinite conducting sheet of charge. Electrical potential – potential due to i) a point charge, ii) charged spherical shell, Equipotential surfaces.

2. Dielectrics:

Electric dipole moment and molecular polarizability- Electric displacement D , electric polarization P – relation between D , E and P - Dielectric constant and susceptibility.

UNIT-II (12 hrs)

3. Electric and magnetic fields

Biot-Savart's law, explanation and calculation of B due to long straight wire and solenoid, Hall effect – determination of Hall coefficient and applications.

4. Electromagnetic induction

Faraday's laws, Lenz's law, Self and mutual inductances, coefficient of coupling, calculation of self inductance of a long solenoid, Energy Stored in magnetic field, Transformer - energy losses - efficiency.

UNIT-III (12 hrs)

5. Alternating currents and electromagnetic waves

Alternating current - Relation between current and voltage in LR and CR circuits - vector diagrams, LCR series and parallel resonant circuits, Q -factor.

6. Maxwell's equations

Idea of displacement current - Maxwell's equations (integral and differential forms) (no derivation), Maxwell's wave equation (with derivation), Transverse nature of electromagnetic waves, production of electromagnetic waves (Hertz experiment).

UNIT-IV (12 hrs)

7. Basic electronics:

PN junction diode and Zener diode - I-V characteristics, PNP and NPN transistors, CB, CE and CC configurations, transistor (CE) characteristics, Determination of hybrid parameters, Transistor as an amplifier.

UNIT-V: (12 hrs)

8. Digital electronics :

Number systems - Conversion of binary to decimal system and vice versa, Laws of Boolean algebra, De Morgan's laws - statement and proof, Basic logic gates, NAND and NOR as universal gates, exclusive-OR gate, Half and full adders.

B.Sc. PHYSICS SYLLABUS UNDER CBCS

For Mathematics Combinations

Paper VI: Modern Physics

(For Maths Combinations)

V Semester

Work load: 60 hrs per semester

4 hrs/week

UNIT-I (12 hrs)

1. Atomic and molecular physics

Introduction, Drawbacks of Bohr's atomic model, Sommerfeld's elliptical orbits - relativistic correction (no derivation). Vector atom model- quantum numbers associated with it, Stern-Gerlach experiment, Zeeman effect and its experimental arrangement. Raman effect - hypothesis, Stokes and Anti Stokes lines, Quantum theory of Raman effect, Experimental arrangement, Applications of Raman effect.

UNIT-II (12 hrs)

2. Matter waves & Uncertainty Principle

Matter waves, de Broglie's hypothesis - wavelength of matter waves, Properties of matter waves, Davisson and Germer experiment. Heisenberg's uncertainty principle for position and momentum (x and p), energy and time (E and t). Experimental verification.

UNIT-III (12 hrs)

3. Quantum (wave) mechanics

Basic postulates of quantum mechanics, Schrodinger time independent and time dependent wave equations - derivations. Physical interpretation of wave function, Application of Schrodinger wave equation to particle in one dimensional potential infinite box.

UNIT-IV(12 hrs)

4. General Properties of Nuclei

Basic ideas of nucleus - size, mass, charge, density, angular momentum, magnetic moment, electric quadrupole moments, binding energy of nucleus, Liquid drop model and Shell model (qualitative aspects only).

5. Radioactivity decay:

Alpha decay: α -decay - Gamow's theory, Geiger Nuttal law, β -decay- electron emission, positron emission, electron capture and neutrino hypothesis of β -decay.

UNIT-V (12 hrs)

6. Crystal Structure

Amorphous and crystalline materials, unit cell, Miller indices, Bragg's law, diffraction of X-rays by crystals- experimental techniques of Laue's method and powder diffraction method.

7. Superconductivity:

Introduction, experimental facts, critical temperature, critical field, Meissner effect, Isotope effect, Type I and type II superconductors, applications of superconductors.

B.Sc. PHYSICS SYLLABUS UNDER CBCS

For Mathematics Combinations

Paper–VII-(A) Elective(Electronics)

Semester – V I

Elective Paper –VII-(A): Analog and Digital Electronics

No. of Hours per week: 04

Total Lectures:60

Unit-I (14 Hours)

1. **FET**-Advantages of FET over BJT ,FET-Construction, Working, characteristics and uses; MOSFET-enhancement MOSFET, depletion MOSFET, construction and working , drain and transfer characteristics of MOSFET, applications of MOSFET.

Unit-II (12Hours)

2. **Operational Amplifiers**: Characteristics of ideal and practical Op-Amp (IC 741), Basic differential amplifiers, Op-Amp supply voltage, IC identification, Internal blocks of Op-Amp, its parameter -off set voltages and currents, CMRR, slew rate.

Unit-III (12 Hours)

3. **Applications of Op-Amp**: Op-Amp as voltage amplifier, Inverting amplifier, Non-inverting amplifier, voltage follower, summing amplifier, difference amplifier, comparator, integrator, differentiator.

Unit-IV(10 Hours)

4. **IC 555 Timer** -Its pin diagram,internal architecture, Application as astable-multivibrator and mono stable multivibrator, Applications of mono stable multivibrator-a) frequency divider b) pulse stretcher, Applications of astable multivibrator-a) square wave oscillator b)Free-running ramp generator .

Unit-V (12 Hours)

5. **Sequential digital circuits**: Flip-flops, RS, Clocked SR, JK, D, T, Master-Slave Flip-flops, Conversion of Flip flops.

Reference Books

1. Digital Electronics by G.K.Kharate Oxford University Press
2. Unified Electronics by Agarwal and Agarwal. Vol I,II&III
3. Op- Amp and Linear ICs by Ramakanth A Gayekwad, 4th edition PHI
4. Digital Principles and Applications by Malvino and Leach, TMH, 1996, 4th edition.
5. Digital Circuit design by Morris Mano,PHI
6. Switching Theory and Logic design by A.AnandKumar ,PHI
7. operations amplifier by SV Subramanyam.

Elective Paper-VII Practical: Analog and Digital Electronics

2hrs/Week

Minimum of 6 experiments to be done and recorded

- 1) Characteristics of FET
- 2) Characteristics of MOSFET
- 3) Characteristics of Op-amp.(IC741)
- 4) Op-Amp as amplifier/inverting amplifier
- 5) Op-Amp as integrator/differentiator
- 6) Op-Amp as summing amplifier/difference amplifier
- 7) IC 555 as astable multivibrator
- 8) IC 555 as monostable amplifier
- 9) Master slave flip-flop

B.Sc. PHYSICS SYLLABUS UNDER CBCS

For Mathematics Combinations

Semester –VI
Cluster Electives VIII-A
Paper – VIII-A-1: Electronic devices and circuits

No. of Hours per week: 04

Total Lectures : 60

UNIT-I : (10hrs)

1.Networks Theorems:

Statement and proofs of Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power transfer theorem, Milliman's theorem and Reciprocity theorem.

UNIT-II : (12 hrs)

2.UJT & SCR:

UJT construction-working, V-I characteristics, Experimental determination of UJT parameters, UJT as a Relaxation oscillator.

Silicon Controlled Rectifier (SCR), Structure and working of SCR. Two transistor representation, Characteristics of SCR. Experimental set up to study the SCR characteristics, Application of SCR for power control.

UNIT-III : (12 hrs)

3.Rectifiers and Power Supplies :

Half wave, full wave and bridge rectifiers-Efficiency-ripple factor- Regulation, Types of filter-choke input(inductor) filter, L-section & π -section filters. Three terminal fixed voltage I.C(78 XX) regulators - Principle and working of SMPS(switch mode power supplies).

UNIT-IV : (12hrs)

4.Photo electric devices: Structure and operation, characteristics, spectral response and application of photo diode, multiple junction photo diode, LDR and LED, Photovoltaic cell.

Unit- V (14 Hours)

5. CRO : Block diagram of basic CRO, construction of CRT, electron gun, electrostatic focusing and acceleration(only explanation) , time base operation, synchronization, front panel controls.

6. Applications CRO: Measurements of dc and ac voltages, ac frequency, time period, special features of dual trace.

REFERENCE BOOKS:

1. Electric Circuit Analysis- **S.R. Paranjothi**- New Age International.
2. Networks and Systems – **D.Roy Chowdary**.
3. Unified Electronics (Circuit Analysis and Electronic Devices) by **Agarwal-Arora**. Vol- I
4. A text book in electrical technology by B.L. Thereja (S.Chand&Co).Vol- IV
5. Electronic devices and circuits by Milman and Halkias.

B.Sc. PHYSICS SYLLABUS UNDER CBCS

For Mathematics Combinations

Semester –VI

Cluster Elective Paper VIII-A-2: Computational Methods and Programming

No. of Hours per week: 04

Total Lectures:60

UNIT-I (12hrs)

1. **Fundamentals of C language:** C character set-Identifiers and Keywords-Constants - Variables-Data types-Declarations of variables-Declaration of storage class-Defining symbolic constants- Assignment statement.
2. **Operators:** Arithmetic operators-Relational operators-Logic operators-Assignment operators- Increment and decrement operators-Conditional operators.

UNIT-II (12hrs)

3. **Expressions and I/O Statements:** Arithmetic expressions-Precedence of arithmetic operators-Type converters in expressions-Mathematical (Library) functions - Data input and output-The getch and putchar functions-Scanf-Printf simple programs.

UNIT-III (12hrs)

4. **Arrays:** One dimensional and two dimensional arrays - Initialization - Type declaration - Inputting and outputting of data for arrays - Programs of matrices addition, subtraction and multiplication

UNIT-IV (12hrs)

5. **Linear and Non - Linear equations:** Solution of Algebra and transcendental equations-Bisection, Falsi position and Newton-Rhapson methods-Basic principles-Formulae-algorithms

UNIT-V (12hrs)

6. **Numerical differentiation and integration:** Numerical differentiation-algorithm for evaluation of first order derivatives using formulae based on Taylor's series-Numerical integration-Trapezoidal and Simpson's 1/3 rule- Formulae-Algorithms.

B.Sc. PHYSICS SYLLABUS UNDER CBCS

For Mathematics Combinations

Semester –VI

Cluster Elective Paper –VIII-A-3: Electronic Instrumentation

No. of Hours per week: 04

Total Lectures:60

Unit – I (12Hours)

1. **Basics of measurements:** Instrument, accuracy, precision, sensitivity, resolution, range, errors in measurement, Multi meter - principle- measurement of dc voltage and dc current, ac voltage and resistance, Operating instructions of multi meter.

Unit -II (10 Hours)

2. **Electronic Voltmeter:** Advantages over conventional multi meter, considerations in selecting voltmeter, Basic volt meter (TVM), Differential voltmeter, Solid state voltmeter AC voltmeter using rectifiers and their significances.

Unit– III (14 Hours)

3. **Digital Multi meter:** Block diagram, working and specifications of digital multi meter, Universal counter and Frequency counter- Block diagram, frequency and time period measurement & accuracy and resolution.

Unit – IV (12 Hours)

4. **Digital instruments:** Comparison of analog and digital instruments, Principle and working of digital instruments - Tacho meter, P^H meter, Capacitance meter and phase meter. Digital voltmeter- advantages, Performance parameters, Block diagram and working.

Unit – V (12 Hours)

5. **Signal generators:** Block diagram explanation, specifications of low frequency signal generators(AF Sine and square wave generator, RF Signal Generator), pulse generator, function generator-working, Brief idea for testing, specifications. Distortion factor meter, wave analysis.

Reference Books

1. A text book in electrical technology by B.L. Thereja (S.Chand&Co)-Vol IV
2. Digital circuits and systems by Venugopal 2011 (Tata Mcgraw Hill)
3. Digital Electronics by SubrathaGhoshal 2012 (Cengage Learning)
4. Electronic measurements and instrumentation by U.A.Bakshi, A.V.Bakshi K.A.Bakshi
5. Electronic instrumentation by H. S. Kalsi.

3. Theories of bonding in metals:

4h

Valence bond theory and Free electron theory, explanation of thermal and electrical conductivity of metals based on these theories, Band theory- formation of bands, explanation of conductors, semiconductors and insulators.

UNIT-III

Solidstate

10h

Symmetry in crystals. Law of constancy of interfacial angles. The law of rationality of indices. The law of symmetry. Miller indices, Definition of lattice point, space lattice, unit cell. Bravais lattices and crystal systems. X-ray diffraction and crystal structure. Bragg's law. Powder method. Defects in crystals. Stoichiometric and non-stoichiometric defects.

UNIT-IV

1. Gaseous state

6h

van der Waal's equation of state. Andrew's isotherms of carbon dioxide, continuity of state. Critical phenomena. Relationship between critical constants and vander Waal's constants. Law of corresponding states. Joule- Thomson effect. Inversion temperature.

2. Liquid state

4h

Liquid crystals, mesomorphic state. Differences between liquid crystal and solid/liquid. Classification of liquid crystals into Smectic and Nematic. Application of liquid crystals as LCD devices.

UNIT-V

Solutions, Ionic equilibrium & dilute solutions

1. Solutions

6h

Azeotropes-HCl-H₂O system and ethanol-water system. Partially miscible liquids-phenol-water system. Critical solution temperature (CST), Effect of impurity on consolute temperature. Immiscible liquids and steam distillation. Nernst distribution law. Applications of distribution law.

2. Ionic equilibrium

3h

Ionic product, common ion effect, solubility and solubility product.

3. Dilute solutions

7h

Colligative properties- RLVP, Osmotic pressure, Elevation in boiling point and depression in freezing point. Experimental methods for the determination of molar mass of a non-volatile solute using osmotic pressure, Elevation in boiling point and depression in freezing point. Abnormal colligative properties. Van't Hoff factor.

Co-curricular activities and Assessment Methods

1. Continuous Evaluation: Monitoring the progress of student's learning
2. Class Tests, worksheets and Quizzes



SKR & SKR GOVT. COLLEGE FOR WOMEN, KADAPA.

(AUTONOMOUS)

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Y.S.R. Kadapa District – 516001, Andhra Pradesh, India.

Affiliated to Yogi Vemana University

2020-21

CHEMISTRY



SEMESTER – II

Course II – (Organic & General Chemistry) 60 hrs (4h/w)

Course outcomes:

At the end of the course, the student will be able to;

1. Understand and explain the differential behavior of organic compounds based on fundamental concepts learnt.
2. Formulate the mechanism of organic reactions by recalling and correlating the fundamental properties of the reactants involved.
3. Learn and identify many organic reaction mechanisms including Free Radical Substitution, Electrophilic Addition and Electrophilic Aromatic Substitution.
4. Correlate and describe the stereochemical properties of organic compounds and reactions.

ORGANIC CHEMISTRY

36h

UNIT-I

Recapitulation of Basics of Organic Chemistry

Carbon-Carbon sigma bonds (Alkanes and Cycloalkanes)

12h

General methods of preparation of alkanes- Wurtz and Wurtz-Fittig reaction, Corey House synthesis, physical and chemical properties of alkanes, Isomerism and its effect on properties, Free radical substitutions; Halogenation, concept of relative reactivity v/s selectivity. Conformational analysis of alkanes (Conformations, relative stability and energy diagrams of Ethane, Propane and butane). General molecular formulae of cycloalkanes and relative stability, Baeyer strain theory, Cyclohexane conformations with energy diagram, Conformations of monosubstituted cyclohexane.

UNIT-II

Carbon-Carbon pi Bonds (Alkenes and Alkynes)

12h

General methods of preparation, physical and chemical properties. Mechanism of E1, E2, E1CB reactions, Saytzeff and Hoffmann eliminations, Electrophilic Additions, mechanism (Markownikoff/Antimarkownikoff addition) with suitable examples, *syn* and *anti*-addition; addition of H₂, X₂, HX. oxymercuration-demercuration, hydroboration-oxidation, ozonolysis, hydroxylation, Diels Alder reaction, 1,2- and 1,4-addition reactions in conjugated dienes.

Reactions of alkynes; acidity, electrophilic and nucleophilic additions, hydration to form carbonyl compounds, Alkylation of terminal alkynes.

UNIT-III

Benzene and its reactivity

12h

Concept of aromaticity, Huckel's rule - application to Benzenoid (Benzene, Naphthalene) and Non-Benzenoid compounds (cyclopropenyl cation, cyclopentadienyl anion and tropylium cation) Reactions - General mechanism of electrophilic aromatic substitution, mechanism of nitration, Friedel- Craft's alkylation and acylation. Orientation of aromatic substitution - ortho, para and meta directing groups. Ring activating and deactivating groups with examples (Electronic interpretation of various groups like NO₂ and Phenolic). Orientation of (i) Amino, methoxy and methyl groups (ii) Carboxy, nitro, nitrile, carbonyl and sulphonic acid groups (iii) Halogens (Explanation by taking minimum of one example from each type)

GENERAL CHEMISTRY

24 h

UNIT-IV

1. Surface chemistry and chemical bonding

Surface chemistry

6h

Colloids- Coagulation of colloids, Hardy-Schulze rule. Stability of colloids, Protection of Colloids, Gold number.

Adsorption-Physical and chemical adsorption, Langmuir adsorption isotherm, applications of adsorption.

2. Chemical Bonding

6h

Valence bond theory, hybridization, VB theory as applied to ClF₃, Ni(CO)₄, Molecular orbital theory -LCAO method, construction of M.O. diagrams for homo-nuclear and hetero-nuclear diatomic molecules (N₂, O₂, CO and NO).

3. HSAB

2h

Pearson's concept, HSAB principle & its importance, bonding in Hard-Hard and Soft-Soft combinations.

UNIT-V

Stereochemistry of carbon compounds

10h

Molecular representations- Wedge, Fischer, Newman and Saw-Horse formulae.

Optical isomerism: Optical activity- wave nature of light, plane polarised light, optical rotation and specific rotation.

diastereomers – Explanation of optical isomerism with examples- Glyceraldehyde, Lactic acid, Alanine, Tartaric acid, 2,3-dibromopentane.

D,L, R,S and E,Z- configuration with examples.

Definition of Racemic mixture – Resolution of racemic mixtures (any 3 techniques)

Co-curricular activities and Assessment Methods

Continuous Evaluation: Monitoring the progress of student's learning

Class Tests, Worksheets and Quizzes

Presentations, Projects and Assignments and Group Discussions: Enhance critical thinking skills and personality

Semester-end Examination: critical indicator of student's learning and teaching methods adopted by teachers throughout the semester.



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CHEMISTRY

SEMESTER - III

Paper III (INORGANIC & ORGANIC CHEMISTRY) 60 hrs (4 h / w)

INORGANIC CHEMISTRY

30 hrs (2h / w)

UNIT – I

1. Chemistry of d-block elements:

9h

Characteristics of d-block elements with special reference to electronic configuration, variable valence, magnetic properties, catalytic properties and ability to form complexes. Stability of various oxidation states

2. Theories of bonding in metals:

6h

Metallic properties and its limitations, Valence bond theory, Free electron theory, Explanation of thermal and electrical conductivity of metals, limitations, Band theory, formation of bands, explanation of conductors, semiconductors and insulators.

UNIT – II

3. Metal carbonyls :

7h

EAN rule, classification of metal carbonyls, structures and shapes of metal carbonyls of V, Cr, Mn, Fe, Co and Ni.

4. Chemistry of f-block elements:

8h

Chemistry of lanthanides - electronic structure, oxidation states, lanthanide contraction, consequences of lanthanide contraction, magnetic properties. Chemistry of actinides - electronic configuration, oxidation states, comparison of lanthanides and actinides.

ORGANIC CHEMISTRY

30 h (2h/w)

UNIT – III

1. Halogen compounds

5 h

Nomenclature and classification of alkyl (into primary, secondary, tertiary), aryl, aryl alkyl, allyl, vinyl, benzyl halides.

SN^1 and SN^2 – reaction mechanism with optically active alkyl halide 2-bromobutane.

2. Hydroxy compounds

5 h

Nomenclature and classification of Alcohols: Preparation with hydroboration reaction and Grignard synthesis. Physical properties- Hydrogen bonding (intermolecular and intramolecular). Effect of hydrogen bonding on boiling point and solubility in water.

Chemical properties:

a) Dehydration of alcohols.

b) Oxidation of alcohols by CrO_3 , $KMnO_4$.

Identification of alcohols by oxidation with $KMnO_4$, Ceric ammonium nitrate, Luca's reagent .

Phenols: Preparation i) from diazonium salt, ii) from cumene.

Chemical Properties: a) Bromination, b) Kolbe-Schmidt reaction(with mechanism)

c) Reimer-Tiemann reaction, (with mechanism), d) azocoupling,

Identification of Phenol with neutral $FeCl_3$

UNIT-IV

Carbonyl compounds

10 h

Nomenclature of aliphatic and aromatic carbonyl compounds, Synthesis of aldehydes from acid chlorides, synthesis of ketones from nitriles. Physical properties: Reactivity of carbonyl group in aldehydes and ketones.

Nucleophilic addition reaction with a) $NaHSO_3$, b) HCN , c) $RMgX$, d) NH_2OH , e) $PhNHNH_2$, f) 2,4 DNPH, With mechanism a) Aldol, b) Cannizzaro's reaction, c)

Perkin reaction, d) Benzoin condensation, Reduction: Clemmensen reduction, Wolf-Kishner reduction, MPV reduction, reduction with $LiAlH_4$ and $NaBH_4$. Analysis of aldehydes and ketones with a) 2,4-DNPH test, b) Tollen's test, c) Fehling test, d) Schiff's test e) Haloform test (with equation)

UNIT-V

1. Carboxylic acids and derivatives

6 h

Nomenclature, classification of carboxylic acids. Methods of preparation by Hydrolysis of nitriles, amides and esters (by acids and bases), c) Carbonation of Grignard reagents. Special methods of preparation of aromatic acids by a) Oxidation of side chain. b) Hydrolysis by benzotrichlorides. c) Kolbe reaction. **Physical properties:**

Hydrogen bonding, dimeric association, **Chemical properties:** Reactions involving H, OH and COOH groups- salt formation, anhydride formation, acid chloride formation, amide formation and esterification (mechanism). Degradation of carboxylic acids by

Huns-Diecker reaction, decarboxylation by Schimdt reaction, halogenation by Hell-Volhard- Zelinsky reaction.

2. Active methylene compounds

4 h

Acetoacetic ester: keto-enol tautomerism, preparation by Claisen condensation, Acid hydrolysis. Preparation of a) monocarboxylic acids. b) Dicarboxylic acids. c) Reaction with urea

Malonic ester: preparation. **Synthetic applications:** Preparation of a) monocarboxylic acids (propionic acid and n-butyric acid). b) Dicarboxylic acids (succinic acid and adipic acid) c) α,β -unsaturated carboxylic acids (crotonic acid). d) Reaction with urea.

List of Reference Books

1. Selected topics in inorganic chemistry by W.D.Malik, G..D.Tuli,R.D.Madan
2. Inorganic Chemistry J E Huheey, E A Keiter and R L Keiter
3. A Text Book of Organic Chemistry by Bahl and Arun bahl
4. A Text Book of Organic chemistry by I L Finar Vol I
5. Organic chemistry by Bruice
6. Organic chemistry by Clayden
7. Advanced Inorganic chemistry by Gurudeep Raj
8. Basic Inorganic Chemistry by Cotton and Wilkinson
9. Concise Inorganic Chemistry by J.D.Lee



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2020-21

CHEMISTRY

SEMESTER IV

Paper IV (SPECTROSCOPY & PHYSICAL CHEMISTRY)

60 hrs (4 h / w)

SPECTROSCOPY

30 hrs

(2h / w)

UNIT-I

6h

Beer-Lambert's law and its limitations, transmittance, absorbance and molar absorptivity. Application of Beer-Lambert law for quantitative analysis of 1. Chromium in $K_2Cr_2O_7$
2. Manganese in Manganous sulphate

Electronic spectroscopy:

8h

Interaction of electromagnetic radiation with molecules and types of molecular spectra. Energy levels of molecular orbitals (σ , π , n). Selection rules for electronic spectra. Types of electronic transitions in molecules effect of conjugation. Concept of chromophore and auxochrome.

UNIT-II

Infra red spectroscopy

8h

Different Regions in Infrared radiations. Modes of vibrations in diatomic and polyatomic molecules. Characteristic absorption bands of various functional groups. Interpretation of spectra-Alkanes, Aromatic, Alcohols carbonyls, and amines with one example to each.

Proton magnetic resonance spectroscopy (1H -NMR)

8h

Principles of nuclear magnetic resonance, equivalent and non-equivalent protons, position of signals. Chemical shift, NMR splitting of signals - spin-spin coupling, coupling constants. Applications of NMR with suitable examples - ethyl bromide, ethanol, acetaldehyde, 1,1,2-tribromo ethane, ethyl acetate, toluene and acetophenone.

PHYSICAL CHEMISTRY

30 hrs (2h / w)

UNIT-III

Dilute solutions

10h

Colligative properties. Raoult's law, relative lowering of vapour pressure, its relation to molecular weight of non-volatile solute. Elevation of boiling point and depression of freezing point. Derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods of determination. Osmosis, osmotic pressure, experimental determination. Theory of dilute solutions. Determination of molecular weight of non-volatile solute from osmotic pressure. Abnormal Colligative properties- Van't Hoff factor.

UNIT-IV

Electrochemistry-I

10h

Specific conductance, equivalent conductance. Variation of equivalent conductance with dilution. Migration of ions, Kohlrausch's law. Arrhenius theory of electrolyte dissociation and its limitations. Ostwald's dilution law. Debye-Huckel-Onsager's equation for strong electrolytes (elementary treatment only). Definition of transport number, determination by Hittorfs method. Application of conductivity measurements- conductometric titrations.

UNIT-V

1. Electrochemistry-II

4h

Single electrode potential, sign convention, Reversible and irreversible cells Nernst Equation- Reference electrode, Standard Hydrogen electrode, calomel electrode, Indicator electrode, metal – metal ion electrode, Inert electrode, Determination of EMF of cell, Applications of EMF measurements - Potentiometric titrations.

2.Phase rule

6h

Concept of phase, components, degrees of freedom. Thermodynamic Derivation of Gibbs phase rule. Phase equilibrium of one component system - water system. Phase equilibrium of two- component system, solid-liquid equilibrium. Simple eutectic diagram of Pb-Ag system, simple eutectic diagram, desilverisation of lead., NaCl-Water system.

List of Reference Books

1. Spectroscopy by William Kemp
2. Spectroscopy by Pavia
3. Organic Spectroscopy by J. R. Dyer
4. Modern Electrochemistry by J.O. M. Bockris and A.K.N.Reddy
5. Advanced Physical Chemistry by Atkins
- 6.Introduction to Electrochemistry by S. Glasstone
- 7.Elementary organic spectroscopy by Y.R.Sharma
8. Spectroscopy by P.S.Kalsi

Bioinorganic Chemistry:

8h

Toxicity of metal ions (Hg, Pb, Cd and As), reasons for toxicity, Use of chelating agents in medicine, Cisplatin as an anti-cancer drug. Iron and its application in bio-systems, Haemoglobin, Myoglobin.

SEMESTER-V

Paper - V (INORGANIC, PHYSICAL & ORGANIC CHEMISTRY) 45 hrs (3 h / w)

INORGANIC CHEMISTRY

UNIT – I

Coordination Chemistry: 8h

IUPAC nomenclature - bonding theories - Review of Werner's theory and Sidgwick's concept of coordination - Valence bond theory - geometries of coordination numbers 4-tetrahedral and square planar and 6-octahedral and its limitations, crystal field theory - splitting of d-orbitals in octahedral, tetrahedral and square-planar complexes - low spin and high spin complexes - merits of crystal-field theory. Isomerism in coordination compounds - structural isomerism and stereo isomerism, stereochemistry of complexes with 4 and 6 coordination numbers.

UNIT-II

1. Magnetic properties of metal complexes: 4h

Types of magnetic behavior, spin-only formula, calculation of magnetic moments, experimental determination of magnetic susceptibility-Gouy method.

2. Stability of metal complexes: 3h

Thermodynamic stability and kinetic stability, factors affecting the stability of metal complexes, chelate effect, determination of composition of complex by Job's method and mole ratio method.

ORGANIC CHEMISTRY

UNIT- III

Nitro hydrocarbons: 3h

Nomenclature and classification-nitro hydrocarbons, structure -Tautomerism of nitroalkanes leading to aci and keto form, Preparation of Nitroalkanes, reactivity -halogenation, reaction with HONO (Nitrous acid), Nef reaction and Mannich reaction leading to Michael addition and reduction.

UNIT – IV

Nitrogen compounds: 12h

Amines (Aliphatic and Aromatic): Nomenclature, Classification into 1°, 2°, 3° Amines and Quaternary ammonium compounds. Preparative methods – 1. Ammonolysis of alkyl halides 2. Gabriel synthesis 3. Hoffman's bromamide reaction (mechanism). Reduction of Amides and Schmidt reaction. Physical properties and basic character - Comparative basic strength of Ammonia, methyl amine, dimethyl amine, trimethyl amine and aniline - comparative basic strength of aniline, N-methylaniline and N,N-dimethyl aniline (in aqueous and non-aqueous medium), steric effects and substituent effects. Chemical properties: a) Alkylation b) Acylation c) Carbylamine reaction d) Hinsberg

separation e) Reaction with Nitrous acid of 1°, 2°, 3° (Aliphatic and aromatic amines).
Electrophillic substitution of Aromatic amines – Bromination and Nitration. Oxidation of aryl and Tertiary amines, Diazotization.

PHYSICAL CHEMISTRY

UNIT- V

Thermodynamics

15h

The first law of thermodynamics-statement, definition of internal energy and enthalpy. Heat capacities and their relationship. Joule-Thomson effect- coefficient. Calculation of w , for the expansion of perfect gas under isothermal and adiabatic conditions for reversible processes. State function. Temperature dependence of enthalpy of formation- Kirchoff s equation. Second law of thermodynamics. Different Statements of the law. Carnot cycle and its efficiency. Carnot theorem. Concept of entropy, entropy as a state function, entropy changes in reversible and irreversible processes. Entropy changes in spontaneous and equilibrium processes.

List of Reference Books

1. Concise coordination chemistry by Gopalan and Ramalingam
2. Coordination Chemistry by Basalo and Johnson
3. Organic Chemistry by G.Mare loudan. Purdue Univ
4. Advanced Physical Chemistry by
5. Text book of physical chemistry by S Glasstone
6. Concise Inorganic Chemistry by J.D.Lee
7. Advanced Inorganic Chemistry Vol-I by Satyaprakash, Tuli, Basu and Madan
8. A Text Book of Organic Chemistry by Bahl and Arun bahl
9. A Text Book of Organic chemistry by I L Finar Vol I
10. Advanced physical chemistry by Gurudeep Raj

SEMESTER-V

Paper - VI (INORGANIC, ORGANIC & PHYSICAL CHEMISTRY)

45 hrs (3 h / w)

INORGANIC CHEMISTRY

UNIT-I

1. Reactivity of metal complexes:

4h

Labile and inert complexes, ligand substitution reactions - SN^1 and SN^2 , substitution reactions of square planar complexes - Trans effect and applications of trans effect.

2. Bioinorganic chemistry:

4h

Essential elements, biological significance of Na, K, Mg, Ca, Fe, Co, Ni, Zn, Metalloporphyrins – Structure and functions of hemoglobin, and Chlorophyll.

PHYSICAL CHEMISTRY

UNIT-II

1. Chemical kinetics

8h

Rate of reaction - Definition of order and molecularity. Derivation of rate constants for first, second, third and zero order reactions and examples. Derivation for time half change. Methods to determine the order of reactions. Effect of temperature on rate of reaction, Arrhenius equation, concept of activation energy.

2. Photochemistry

5h

Difference between thermal and photochemical processes. Laws of photochemistry- Grothus-Draper's law and Stark-Einstein's law of photochemical equivalence. Quantum yield-Photochemical reaction mechanism- hydrogen- chlorine, hydrogen- bromine reaction. Qualitative description of fluorescence, phosphorescence, Photosensitized reactions- energy transfer processes (simple example)

ORGANIC CHEMISTRY

UNIT- III

Heterocyclic Compounds

7h

Introduction and definition: Simple five membered ring compounds with one hetero atom
Ex. Furan. Thiophene and pyrrole - Aromatic character – Preparation from 1,4,-dicarbonyl compounds, Paul-Knorr synthesis.

Properties : Acidic character of pyrrole - electrophilic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions - Diels Alder reaction in furan.

Pyridine – Structure - Basicity - Aromaticity - Comparison with pyrrole - one method of preparation and properties - Reactivity towards Nucleophilic substitution reaction.

UNIT-IV

Carbohydrates

8h

Monosaccharides: (+) Glucose (aldo hexose) - Evidence for cyclic structure of glucose (some negative aldehydes tests and mutarotation) - Proof for the ring size (methylation, hydrolysis and oxidation reactions) - Pyranose structure (Haworth formula and chair conformational formula).

(-) Fructose (ketohehexose) - Evidence of 2 - ketohehexose structure (formation of pentaacetate, formation of cyanohydrin its hydrolysis and reduction by HI). Cyclic structure for fructose (Furanose structure and Haworth formula) - osazone formation from glucose and fructose – Definition of anomers with examples.

Interconversion of Monosaccharides: Aldopentose to Aldohexose (Arabinose to D- Glucose, D-Mannose) (Kiliani - Fischer method). Epimers, Epimerisation - Lobry de bruyn van Ekenstein rearrangement. Aldohexose to Aldopentose (D-Glucose to D- Arabinose) by Ruff degradation. Aldohexose to Ketohehexose [(+) Glucose to (-) Fructose] and Ketohehexose to Aldohexose (Fructose to Glucose)

UNIT- V

Amino acids and proteins

7h

Introduction: Definition of Amino acids, classification of Amino acids into alpha, beta, and gamma amino acids. Natural and essential amino acids - definition and examples, classification of alpha amino acids into acidic, basic and neutral amino acids with examples. Methods of synthesis: General methods of synthesis of alpha amino acids (specific examples - Glycine, Alanine, valine and leucine) by following methods: a) from halogenated carboxylic acid b) Malonic ester synthesis c) strecker's synthesis.

Physical properties: Zwitter ion structure - salt like character - solubility, melting points, amphoteric character, definition of isoelectric point.

Chemical properties: General reactions due to amino and carboxyl groups - lactams from gamma and delta amino acids by heating peptide bond (amide linkage). Structure and nomenclature of peptides and proteins.

List of Reference Books

1. Concise coordination chemistry by Gopalan and Ramalingam
2. Coordination Chemistry by Basalo and Johnson
3. Organic Chemistry by G.Mare loudan, Purdue Univ
4. Advanced Physical Chemistry by Atkins
5. Text book of physical chemistry by S Glasstone

SEMESTER-VI
ELECTIVE PAPER – VII: ENVIRONMENTAL CHEMISTRY
45 hrs (3 h / w)

UNIT-I

Introduction

9h

Concept of Environmental chemistry-Scope and importance of environment in now adays – Nomenclature of environmental chemistry – Segments of environment - Natural resources – Renewable Resources – Solar and biomass energy and Nonrenewable resources – Thermal power and atomic energy – Reactions of atmospheric oxygen and Hydological cycle.

UNIT-II

Air Pollution

9h

Definition – Sources of air pollution – Classification of air pollution – Acid rain – Photochemical smog – Green house effect – Formation and depletion of ozone – Bhopal gas disaster – Controlling methods of air pollution.

UNIT-III

Water pollution

9h

Unique physical and chemical properties of water – water quality and criteria for finding of water quality – Dissolved oxygen – BOD, COD, Suspended solids, total dissolved solids, alkalinity – Hardness of water – Methods to convert temporary hard water into soft water – Methods to convert permanent hard water into soft water – eutrophication and its effects – principal wastage treatment – Industrial waste water treatment.

UNIT-IV

Chemical Toxicology

9h

Toxic chemicals in the environment – effects of toxic chemicals – cyanide and its toxic effects – pesticides and its biochemical effects – toxicity of lead, mercury, arsenic and cadmium.

UNIT-V

Ecosystem and biodiversity

9h

Ecosystem

Concepts – structure – Functions and types of ecosystem – Abiotic and biotic components – Energy flow and Energy dynamics of ecosystem – Food chains – Food web – Tropic levels – Biogeochemical cycles (carbon, nitrogen and phosphorus)

Biodiversity

Definition – level and types of biodiversity – concept - significance – magnitude and distribution of biodiversity – trends - biogeographical classification of india – biodiversity at national, global and regional level.

List of Reference books

1. Fundamentals of ecology by M.C.Dash
2. A Text book of Environmental chemistry by W. Moore and F.A. Moore
3. Environmental Chemistry by Samir k. Banerji

Cluster Elective –VIII A
Fuels and Industrial Inorganic materials
PAPER – VIII-A-1: FUEL CHEMISTRY AND BATTERIES

45 hrs (3 h / w)

- UNIT –I** **12h**
Review of energy sources (renewable and non-renewable) – classification of fuels and their calorific value. Coal: Uses of Coal (fuel and non fuel) in various industries, its composition, carbonization of coal - coal gas, producer gas and water gas – composition and uses – fractionation of coal tar – uses of coal tar based chemicals, requisites of a good metallurgical coke, coal gasification (Hydro gasification and catalytic gasification) coal liquefaction and solvent refining.
- UNIT-II** **6h**
Petroleum and petrol chemical industry:
Composition of crude petroleum, refining and different types of petroleum products and their applications.
- UNIT-III** **10h**
Fractional distillation (principle and process), cracking (Thermal and catalytic cracking). Reforming petroleum and non petroleum fuels (LPG, CNG, LNG, biogas), fuels derived from biomass, fuel from waste, synthetic fuels (gaseous and liquids), clear fuels, petro chemicals : vinyl acetate, propylene oxide, isoprene, butadiene, toluene and its derivative xylene.
- UNIT-IV** **10h**
Lubricants:
Classification of lubricants, lubricating oils (conducting and non conducting), solid and semi solid lubricants, synthetic lubricants. Properties of lubricants (viscosity index, cloud point, pore point) and their determination.
- UNIT-V** **7h**
Batteries:
Primary and secondary batteries, battery components and their role, Characteristics of Battery. Working of following batteries: Pb acid, Li-Battery, Solid state electrolyte battery. Fuel cells, Solar cell and polymer cell.

Reference books:

1. E. Stochi : Industrial chemistry, Vol-1, Ellis Horwood Ltd. UK
 2. P. C. Jain, M. Jain: Engineering chemistry, Dhannpat Rai & sons, Delhi.
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SEMESTER-VI
PAPER – VIII-A-2: INORGANIC MATERIALS OF INDUSTRIAL
IMPORTANCE

45 hrs (3 h / w)

UNIT - I

Recapitulation of s- and p-Block Elements

8h

Periodicity in s- and p-block elements with respect to electronic configuration, atomic and ionic size, ionization enthalpy, electronegativity (Pauling, Mulliken, and Alfred - Rochow scales). Allotropy in C, S, and P. Oxidation states with reference to elements in unusual and rare oxidation states like carbides and nitrides), inert pair effect, diagonal relationship and anomalous behaviour of first member of each group.

UNIT – II

15h

Silicate Industries

Glass: Glassy state and its properties, classification (silicate and non-silicate glasses).

Manufacture and processing of glass. Composition and properties of the following types of glasses: Soda lime glass, lead glass, armoured glass, safety glass, borosilicate glass, fluorosilicate, coloured glass, photosensitive glass.

Ceramics: Important clays and feldspar, ceramic, their types and manufacture. High technology ceramics and their applications, superconducting and semiconducting oxides, fullerenes carbon nanotubes and carbon fibre.

Cements: Classification of cement, ingredients and their role, Manufacture of cement and the

setting process, quick setting cements.

UNIT – III

8h

Fertilizers:

Different types of fertilizers. Manufacture of the following fertilizers: Urea, ammonium nitrate, calcium ammonium nitrate, ammonium phosphates; polyphosphate, superphosphate, compound and mixed fertilizers, potassium chloride, potassium sulphate.

UNIT – IV

8h

Surface Coatings:

Objectives of coatings surfaces, preliminary treatment of surface, classification of surface coatings. Paints and pigments-formulation, composition and related properties. Oil paint, Vehicle, modified oils, Pigments, toners and lakes pigments, Fillers, Thinners, Enamels, emulsifying agents. Special paints (Heat retardant, Fire retardant, Eco-friendly paint, Plastic paint), Dyes, Wax polishing, Water and Oil paints, additives, Metallic coatings (electrolytic and electroless), metal spraying and anodizing.

UNIT – V

6h

Alloys:

Classification of alloys, ferrous and non-ferrous alloys, Specific properties of elements in alloys. Manufacture of Steel (removal of silicon decarbonization, demanganization, desulphurization dephosphorisation) and surface treatment (argon treatment, heat treatment, nitriding, carburizing). Composition and properties of different types of steels.

Chemical explosives:

Origin of explosive properties in organic compounds, preparation and explosive properties of lead azide, PETN, cyclonite (RDX). Introduction to rocket propellants.

Reference Books:

1. E. Stocchi: *Industrial Chemistry*, Vol-I, Ellis Horwood Ltd. UK.
2. R. M. Felder, R. W. Rousseau: *Elementary Principles of Chemical Processes*, Wiley Publishers, New Delhi.
3. W. D. Kingery, H. K. Bowen, D. R. Uhlmann: *Introduction to Ceramics*, Wiley Publishers, New Delhi.
4. J. A. Kent: *Riegel's Handbook of Industrial Chemistry*, CBS Publishers, New Delhi.
5. P. C. Jain & M. Jain: *Engineering Chemistry*, Dhanpat Rai & Sons, Delhi.
6. R. Gopalan, D. Venkappayya, S. Nagarajan: *Engineering Chemistry*, Vikas Publications, New Delhi.
7. B. K. Sharma: *Engineering Chemistry*, Goel Publishing House, Meerut

SEMESTER-VI

PAPER – VIII-A-3: ANALYSIS OF APPLIED INDUSTRIAL PRODUCTS

45 hrs (3 h / w)

UNIT-I

Analysis of soaps: moisture and volatile matter, combined alkali, total fatty matter, free alkali, total fatty acid, sodium silicate and chlorides.

Analysis of paints: Vehicle and pigments, Barium Sulphate, total lead, lead chromate, iron pigments, zinc chromate

UNIT- II

Analysis of oils: saponification value, iodine value, acid value, ester value, bromine value, acetyl value.

Analysis of industrial solvents like benzene, acetone, methanol and acetic acid.,
Determination of methoxyl and N-methyl groups.,

UNIT-III

Analysis of fertilizers: urea, NPK fertilizer, super phosphate,

Analysis of DDT, BHC, endrin, endosulfone, malathion, parathion.,

Analysis of starch, sugars, cellulose and paper,

UNIT -IV

Gas analysis: carbon dioxide, carbon monoxide, oxygen, hydrogen, saturated hydrocarbon, unsaturated hydrocarbons, nitrogen, octane number, cetane number

Analysis of Fuel gases like: water gas, producer gas, kerosene (oil) gas.

Ultimate analysis: carbon, hydrogen, nitrogen, oxygen, phosphorus and sulfur.,

UNIT - V

Analysis of Complex materials:

Analysis of cement- loss on ignition, insoluble residue, total silica, sesqui oxides, lime, magnesia, ferric oxide, sulphuric anhydride.

Analysis of glasses - Determination of silica, sulphur, barium, arsenic, antimony, total R_2O_3 , calcium, magnesium, total alkalis, aluminium, chloride, fluoride



SKR & SKR GOVT. COLLEGE FOR WOMEN, KADAPA.
(AUTONOMOUS)

Reaccredited with 'B' Grade by NAAC
Y.S.R. Kadapa District – 516001, Andhra Pradesh, India.
Affiliated to Yogi Vemana University



2020-21

Computer Science

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 to write 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.

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. Comprehend Data 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 on Data 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

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, CircularQueues, 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”, Yashavant Kanetkar, 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)

II YEAR III SEMESTER

Paper-III : OBJECT ORIENTED PROGRAMMING USING JAVA

Course Objectives

As the business environment becomes more sophisticated, the software development (software engineering is about managing complexity) is becoming increasingly complex. As of the best programming paradigm which helps to eliminate complexity of large projects, Object Oriented Programming (OOP) has become the predominant technique for writing software in the past decade. Many other important software development techniques are based upon the fundamental ideas captured by object-oriented programming.

Course Outcomes

At the end of this course student will:

1. Understand the concept and underlying principles of Object-Oriented Programming
2. Understand how object-oriented concepts are incorporated into the Java programming language
3. Develop problem-solving and programming skills using OOP concept
4. Understand the benefits of a well structured program
5. Develop the ability to solve real-world problems through software development in high-level programming language like Java
6. Develop efficient Java applets and applications using OOP concept
7. Become familiar with the fundamentals and acquire programming skills in the Java language.

UNIT – I

FUNDAMENTALS OF OBJECT – ORIENTED PROGRAMMING: Object Oriented paradigm –Basic concepts of Object Oriented Programming – Benefits of OOP –Applications of OOP.

Overview of Java Language: Simple Java Program – Java Program Structure – Java Tokens- Java Statements – Implementing a Java Program – Java Virtual Machine – Command Line Arguments.

Constants, Variables and Data types: Constants – Variables – Data types – Declaration of Variables-Giving Values to variables- Scope of Variables-Symbolic Constants-Type Casting.

UNIT – II

Operators and Expressions: Arithmetic Operators – Relational Operators- Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operators – Bitwise Operators – Special Operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic Operators – Operator Precedence and Associativity.

Decision Making and Branching: Decision Making with If statement – Simple If Statement-If else Statement-Nesting If Else Statement- the Else If Ladder-The switch Statement – The ?: operator.

Decision Making and Looping: The while statement – The do statement – The for statement – Jumps in Loops, labelled loops.

UNIT – III

Class, Objects and Methods: Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing class members – Constructors – Methods Overloading – Static Members – Nesting of Methods, Inheritance – Overriding Methods – Final Variables and Methods – Final Classes – Abstract Methods and Classes – Visibility Control.

Arrays, Strings and Vectors: One-dimensional Arrays-creating an Array – Two dimensional Arrays – Strings – Vectors – Wrapper Classes – Enumerated Types.

UNIT – IV

Interfaces: Multiple Inheritance - Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables.

Packages: Java API packages – Using system Packages – Naming Conventions – Creating Packages – Accessing a Package – Using a Package – Adding a Class to a Package – Hiding Classes – Static Import.

Multithreaded Programming: Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread –Using Thread Methods –Thread Exceptions – Thread Priority – Synchronization.

UNIT - V

Managing Errors and Exceptions: Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing our own Exceptions – Using Exceptions for debugging.

Applet Programming: How Applets differ from Applications – Preparing to write Applets – Building Applet Code – Applet Life Cycle – Creating an executable Applet – Designing a WebPage – Applet Tag – Adding Applet to HTML file – Running the Applet – More about Applet Tag – Passing parameters to Applets – Aligning the display – More about HTML tags – Displaying Numerical Values – Getting Input from the user.

Reference Books:

1. E.Balagurusamy, Programming with JAVA, A primer, 3e, TATA McGraw-Hill Company.
2. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series, TATA McGraw-Hill Company.
3. Deitel &Deitel. Java TM: How to Program, PHI (2007)
4. Java Programming: From Problem Analysis to Program Design- D.S Mallik
5. Object Oriented Programming Through Java by P. Radha Krishna, Universities Press (2008)

Student Activity:

1. Create a front end using JAVA for the student database created
2. Learn the difference between ODBC and JDBC

II YEAR IV SEMESTER

Paper-IV: DATA STRUCTURES

Course Objectives

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

Course Outcomes

After completing this course satisfactorily, a student will be able to:

1. Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms
2. Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs.
3. Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs
4. Demonstrate different methods for traversing trees
5. Compare alternative implementations of data structures with respect to performance
6. Compare and contrast the benefits of dynamic and static data structures implementations
7. Describe the concept of recursion, give examples of its use, describe how it can be implemented using a stack .
8. Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.

UNIT I

Concept of Abstract Data Types (ADTs)- Data Types, Data Structures, Storage Structures, Primitive and Non-primitive Data Structures, Linear and Non-linear Data Structures.

Linear Lists – ADT, Array and Linked representations, Pointers.

Linked Lists: Single Linked List, Double Linked List, Circular Linked List , applications

UNIT II

Stacks: Definition, ADT, Array and Linked representations, Implementations and Applications

Queues: Definition, ADT, Array and Linked representations, Circular Queues, Dequeues, Priority Queues, Implementations and Applications.

UNIT III

Trees: Binary Tree, Definition, Properties, ADT, Array and Linked representations, Implementations and Applications. Binary Search Trees (BST) – Definition, ADT, Operations and Implementations, BST Applications. Introduction to Threaded Binary Trees, Heap trees.

UNIT IV

Graphs – Graph and its Representation, Graph Traversals, Connected Components, Basic Searching Techniques, Minimal Spanning Trees

UNIT- V

Sorting and Searching: Selection, Insertion, Bubble, Merge, Quick, Heap sort, Sequential and Binary Searching.

REFERENCE BOOKS

1. D S Malik, Data Structures Using C++, Thomson, India Edition 2006.
2. Sahni S, Data Structures, Algorithms and Applications in C++, McGraw-Hill, 2002.
3. SamantaD, Classic Data Structures, Prentice-Hall of India, 2001.
4. Heilman G I, Data Structures and Algorithms with Object-Oriented Programming, Tata McGraw-Hill. 2002. (Chapters I and 14).
5. Tremblay P, and Sorenson P G, Introduction to Data Structures with Applications, Tata McGraw-Hill,

Student activity:

1. Create a visible stack using C-graphics
2. Create a visible Queue using C-graphics

III YEAR V SEMESTER

Paper-V: **Data Base Management System**

Course Objective:

Design & develop database for large volumes & varieties of data with optimized data processing techniques.

Course Outcomes

On completing the subject, students will be able to:

1. Design and model of data in database.
2. Store, Retrieve data in database.

UNIT I

Overview of Database Management System: Introduction, Data and information, Database, Database management System, Objectives of DBMS, Evaluation of Database management System, Classification of Database Management System, file-based system, Drawbacks of file-Based System, advantages of DBMS, Data models, Database Architecture.

UNIT II

Relational Model: Introduction, CODD's Rules, relational data model, concept of key, relational integrity, relational algebra, relational algebra operations, advantages of relational algebra, limitations of relational algebra.

UNIT III

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, advantages of ER modelling.

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, Table Truncation, Imposition of Constraints, Join Operation, Set Operations, View, Sub Query, Embedded SQL,

UNIT V

PL/SQL: Introduction, Structure of PL/SQL, PL/SQL Language Elements, Data Types, Operators Precedence, Control Structure, Steps to Create a PL/SQL, Program, Iterative Control, Cursors, Steps to create a Cursors, Procedure, Function, Exceptions Handling.

III YEAR V SEMESTER

Paper VI: Software Engineering

Course Objectives

The Objective of the course is to assist the student in understanding the basic theory of software engineering, and to apply these basic theoretical principles to a group software development project.

Course outcomes

1. Ability to gather and specify requirements of the software projects.
2. Ability to analyze software requirements with existing tools
3. Able to differentiate different testing methodologies
4. Able to understand and apply the basic project management practices in real life projects
5. Ability to work in a team as well as independently on software projects

UNIT I

INTRODUCTION: Software Engineering Process paradigms - Project management - Process and Project Metrics – software estimation - Empirical estimation models - Planning - Risk analysis.

UNIT II

REQUIREMENTS ANALYSIS: Requirement Engineering Processes – Feasibility Study – Software Requirement Analysis – Analysis Concepts and Principles – Analysis Process – Analysis Model.

UNIT III

SOFTWARE DESIGN: Software design - Abstraction - Modularity - Software Architecture - Effective modular design - Cohesion and Coupling - Architectural design and Procedural design - Data flow oriented design.

UNIT IV

USER INTERFACE DESIGN AND REAL TIME SYSTEMS: User interface design - Human computer interaction - Human - Computer Interface design - Interface design - Interface standards.

UNIT V

SOFTWARE QUALITY AND TESTING: Software Quality Assurance - Software Reliability - Software testing - Path testing – Control Structures testing - Black Box testing - Integration, Validation and system testing.

III YEAR VI SEMESTER

Paper-VII: Web Technologies

Course Objective

- To provide knowledge on web architecture, web services, client side and server side scripting technologies to focus on the development of web-based information systems and web services.
- To provide skills to design interactive and dynamic web sites.

Course Outcome

1. To understand the web architecture and web services.
2. To practice latest web technologies and tools by conducting experiments.
3. To design interactive web pages using HTML and Style sheets.
4. To study the framework and building blocks of .NET Integrated Development Environment.
5. To provide solutions by identifying and formulating IT related problems.

Unit I

HTML: Basic HTML, Document body, Text, Hyper links, adding more formatting, Lists, Tables using images. **More HTML:** Multimedia objects, Frames, Forms towards interactive, HTML document heading detail.

Unit II

Cascading Style Sheets: Introduction, using Styles, simple examples, your own styles, properties and values in styles, style sheet, formatting blocks of information, layers.

Unit III

Introduction to JavaScript: What is DHTML, JavaScript, basics, variables, string manipulations, mathematical functions, statements, operators, arrays, functions. **Objects in JavaScript:** Data and objects in JavaScript, regular expressions, exception handling.

Unit IV

DHTML with JavaScript: Data validation, opening a new window, messages and confirmations, the status bar, different frames, rollover buttons, moving images.

Unit V

XML: defining data for web applications, basic XML, document type definition, presenting XML. document object model. Web Services.

III YEAR VI SEMESTER
Cluster Elective VIIIA
Paper-VIII-A1: Foundations of Data Science

Course Objectives

Modern scientific, engineering, and business applications are increasingly dependent on data, existing traditional data analysis technologies were not designed for the complexity of the modern world. Data Science has emerged as a new, exciting, and fast-paced discipline that explores novel statistical, algorithmic, and implementation challenges that emerge in processing, storing, and extracting knowledge from Big Data.

Course Outcomes

1. Able to apply fundamental algorithmic ideas to process data.
2. Learn to apply hypotheses and data into actionable predictions.
3. Document and transfer the results and effectively communicate the findings using visualization techniques.

UNIT I

INTRODUCTION TO DATA SCIENCE : Data science process – roles, stages in data science project – working with data from files – working with relational databases – exploring data – managing data – cleaning and sampling for modeling and validation – introduction to NoSQL.

UNIT II

MODELING METHODS : Choosing and evaluating models – mapping problems to machine learning, evaluating clustering models, validating models – cluster analysis – K-means algorithm.

UNIT III

INTRODUCTION TO R Language: Reading and getting data into R – ordered and unordered factors – arrays and matrices – lists and data frames.

UNIT IV

MAP REDUCE: Introduction – distributed file system – algorithms using map reduce, Matrix-Vector Multiplication by Map Reduce – Hadoop - Understanding the Map Reduce architecture.

UNIT V

DELIVERING RESULTS : Documentation and deployment – producing effective presentations– Introduction to graphical analysis – plot() function – displaying multivariate data.

Reference Books

1. [Nina Zumel](#), John Mount, “Practical Data Science with R”, Manning Publications, 2014.
2. [Jure Leskovec](#), [Anand Rajaraman](#), [Jeffrey D. Ullman](#), “Mining of Massive Datasets”, Cambridge University Press, 2014.
3. [Mark Gardener](#), “Beginning R - The Statistical Programming Language”, John Wiley & Sons, Inc., 2012.
4. [W. N. Venables](#), [D. M. Smith](#) and the R Core Team, “An Introduction to R”, 2013.
5. [Tony Ojeda](#), [Sean Patrick Murphy](#), [Benjamin Bengfort](#), [Abhijit Dasgupta](#), “Practical Data Science Cookbook”, Packt Publishing Ltd., 2014.
6. [Nathan Yau](#), “Visualize This: The FlowingData Guide to Design, Visualization, and Statistics”, Wiley, 2011.
7. [Boris Lublinsky](#), [Kevin t. Smith](#), [Alexey Yakubovich](#), “Professional Hadoop Solutions”, Wiley, ISBN: 9788126551071, 2015.

Student Activity:

1. **Collect data from any real time system and create clusters using any clustering algorithm**
2. **Read the student exam data in R perform statistical analysis on data and print results.**

Paper-VIII-A2 : BIG DATA TECHNOLOGY

Course Objective

The Objective of this course is to provide practical foundation level training that enables immediate and effective participation in big data projects. The course provides grounding in basic and advanced methods to big data technology and tools, including MapReduce and Hadoop and its ecosystem.

Course Outcome

1. Learn tips and tricks for Big Data use cases and solutions.
2. Learn to build and maintain reliable, scalable, distributed systems with Apache Hadoop.
3. Able to apply Hadoop ecosystem components.

UNIT I

INTRODUCTION TO BIG DATA: Introduction – distributed file system – Big Data and its importance, Four V's in big data, Drivers for Big data, Big data analytics, Big data applications. Algorithms using map reduce, Matrix-Vector Multiplication by Map Reduce.

UNIT II

INTRODUCTION HADOOP : Big Data – Apache Hadoop & Hadoop Eco-System – Moving Data in and out of Hadoop – Understanding inputs and outputs of MapReduce - Data Serialization.

UNIT- III

HADOOP ARCHITECTURE: Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands, Anatomy of File Write and Read., NameNode, Secondary NameNode, and DataNode.

UNIT-IV

Hadoop Map Reduce paradigm, Map and Reduce tasks, Job, Task trackers - Cluster Setup – SSH & Hadoop Configuration – HDFS Administering –Monitoring & Maintenance.

UNIT-V

HIVE AND HIVEQL, HBASE:-Hive Architecture and Installation, Comparison with Traditional Database, HiveQL - Querying Data - Sorting And Aggregating, Map Reduce Scripts, Joins & Subqueries.

Reference Books

1. Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, “Professional Hadoop Solutions”, Wiley, ISBN: 9788126551071, 2015.
2. Chris Eaton, Dirk deroos et al., “Understanding Big data ”, McGraw Hill, 2012.
3. Tom White, “HADOOP: The definitive Guide”, O Reilly 2012.
4. Vignesh Prajapati, “Big Data Analytics with R and Hadoop”, Packet Publishing 2013.
5. Tom Plunkett, Brian Macdonald et al, “Oracle Big Data Handbook”, Oracle Press, 2014.
6. Jy Liebowitz, “Big Data and Business analytics” CRC press, 2013.

Student Activity:

1. Collect real time data and justify how it has become Big Data
2. Reduce the dimensionality of a big data using your own map reducer

Paper-VIII-A3 : COMPUTING FOR DATA ANALYTICS

Course Objectives

The objective of this course is to teach fundamental concepts and tools needed to understand the emerging role of business analytics in Organizations.

Course Outcomes

1. Learn the Big Data in Technology Perspective.
2. Understanding of the statistical procedures most often used by practicing engineers
3. Understand Forecasting methods and apply for business applications.

UNIT – I

DATA ANALYTICS LIFE CYCLE: Introduction to Big data Business Analytics - State of the practice in analytics role of data scientists - Key roles for successful analytic project - Main phases of life cycle - Developing core deliverables for stakeholders.

UNIT – II

STATISTICS Sampling Techniques : Data classification, Tabulation, Frequency and Graphic representation - Measures of central value - Arithmetic mean, Geometric mean, Harmonic mean, Mode, Median, Quartiles, Deciles, Percentile.

UNIT – III

PROBABILITY AND HYPOTHESIS TESTING: Random variable, distributions, two dimensional R.V, joint probability function, marginal density function. Random vectors - Some special probability distribution - Binomial, Poison, Geometric, uniform, exponential, normal, gamma and Erlang. Multivariate normal distribution.

UNIT – IV

PREDICTIVE ANALYTICS: Predictive modeling and Analysis - Regression Analysis, Multicollinearity, Correlation analysis, Rank correlation coefficient, Multiple correlation, Least square, Curve fitting and good ness of fit.

UNIT – V

TIME SERIES FORECASTING AND DESIGN OF EXPERIMENTS :Forecasting Models for Time series : MA, SES, TS with trend, season - Design of Experiments, one way classification, two way classification, ANOVA, Latin square, Factorial Design.

Reference Books

1. Chris Eaton, Dirk Deroos, Tom Deutsch et al., “Understanding Big Data”, McGrawHill, 2012.
2. Alberto Cordoba, “Understanding the Predictive Analytics Lifecycle”, Wiley, 2014.
3. Eric Siegel, Thomas H. Davenport, “Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie, or Die”, Wiley, 2013.
4. James R Evans, “Business Analytics – Methods, Models and Decisions”, Pearson 2013.
5. R. N. Prasad, Seema Acharya, “Fundamentals of Business Analytics”, Wiley, 2015.
6. S M Ross, “Introduction to Probability and Statistics for Engineers and Scientists”, Academic Foundation, 2011.
7. David Hand, Heiki Mannila, Padhria Smyth, “Principles of Data Mining”, PHI 2013.
8. Spyros Makridakis, Steven C Wheelwright, Rob J Hyndman, “Forecasting methods and applications”, Wiley 2013(Reprint).

Student Activity:

1. Collect temperatures of previous months and prepare a logic to estimate the temperature of next one week
2. Collect real time data and apply statistical techniques to classify it.

III YEAR VI SEMESTER
(Cluster 2) Paper-VIII: Elective –B-1

Distributed Systems

Course Objectives

- To expose the fundamentals of distributed computer systems, assuming the availability of facilities for data transmission.
- To discuss multiple levels of distributed algorithms, distributed file systems, distributed databases, security and protection.

Course Outcomes

- Create models for distributed systems.
- Apply different techniques learned in the distributed system.

UNIT I

Introduction to Distributed Computing Systems, System Models, and Issues in Designing a Distributed Operating System, Examples of distributed systems.

UNIT II

Features of Message Passing System, Synchronization and Buffering, Introduction to RPC and its models, Transparency of RPC, Implementation Mechanism, Stub Generation and RPC Messages, Server Management.

UNIT III

Introduction, Design and implementation of DSM system, Granularity and Consistency Model, Advantages of DSM, Clock Synchronization, Event Ordering, Mutual exclusion, Deadlock.

UNIT IV

Task Assignment Approach, Load Balancing Approach, Load Sharing Approach, Process Migration and Threads.

UNIT V

File Models, File Accessing Models, File Sharing Semantics, File Caching Schemes, File Replication, Atomic Transactions, Access control.

III YEAR VI SEMESTER
(Cluster 2) Paper-VIII : Elective –B-2

Cloud Computing

Course Objectives:

The student will learn about the cloud environment, building software systems and components that scale to millions of users in modern internet, cloud concepts capabilities across the various cloud service models including IaaS, Paas, SaaS, and developing cloud based software applications on top of cloud platforms.

Course Outcomes

1. Compare the strengths and limitations of cloud computing
2. Identify the architecture, infrastructure and delivery models of cloud computing
3. Apply suitable virtualization concept.
4. Choose the appropriate cloud player, Programming Models and approach.
5. Address the core issues of cloud computing such as security, privacy and interoperability
6. Design Cloud Services and Set a private cloud

UNIT I

Introduction & Concepts: Introduction to cloud computing: introduction, characteristics of cloud computing, cloud models, cloud services examples, cloud-based services & applications.

Cloud Concepts & Technologies: Virtualization, Load Balancing, Scalability & Elasticity, Deployment, Replication, Monitoring, Software Defined Networking, Networking Function Virtualization, Map Reduce, Identity And Access Management, Service Level Agreements, Billing.

UNIT II

Cloud Services & Platforms: Compute Services, Storage Services, Database Services, Applications Services, Content Delivery Services, Analytics Services, Deployment & Management Services, Identity & Access Management Services, Open Source Private Cloud Software.

UNIT III

Cloud Application Design: Introduction, Design Considerations for Cloud Applications, Reference Architecture for Cloud Applications, Cloud Application Design Methodologies, Data Storage Approaches.

UNIT IV

Python Basics: Introduction, Installing Python, Python Data Types & Data Structures, Control flow, Functions, Modules, Packages, File Handling, Date/Time Operations, Classes 163.

UNIT V

Python for Cloud: Python for Amazon Web Services, Python for Google Cloud Platform, Python for Windows Azure.

TEXT BOOK:

1. Cloud Computing A Hands On Approach By Arshdeep Bahga And Vijay Madiseti From University Press.

Reference Books

1. Cloud computing a practical approach - Anthony T.Velte , Toby J. Velte Robert Elsenpeter TATA McGraw- Hill , New Delhi - 2010
2. Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online - Michael Miller - Que 2008
3. Cloud Computing, Theory and Practice, Dan C Marinescu, MK Elsevier.
4. Cloud Computing, A Hands on approach, Arshadeep Bahga, Vijay Madiseti, University Press
5. Mastering Cloud Computing, Foundations and Application Programming, Raj Kumar Buyya, Christenvecctiola, S Tammarai selvi, TMH

Student Activity:

1. Prepare the list of companies providing cloud services category wise.
2. Create a private cloud using local server

III YEAR VI SEMESTER
(Cluster 2) Paper-VIII: Elective –B-3

Cryptography and Network Security

Course Objectives:

The student will learn about the different security issues in different environments. This will also helps us to learn different sciences in providing security like cryptography and steganography.

Course Outcomes

1. Compare the strengths and limitations of different security mechanisms
2. Address the core issues of security and transmission of information.
3. Develop simple and new algorithms.

UNIT 1:

Introduction: Attacks, services and mechanisms, security attacks, security services, a model for internet work security.

Classical techniques: Conventional encryption model, steganography, classical encryption techniques

Modern techniques: Simplified DES, block cipher principles, data encryption standard, strength of DES, differential and linear crypt analysis, block cipher design principles and modes of operations.

UNIT 2:

Conventional encryption: Placement of encryption function, traffic confidentiality, key distribution, random number generation.

Public key cryptography: Principles, RSA algorithm, key management, Diffie-Hellmen key exchange, elliptic curve cryptography.

UNIT 3:

Message authentication and hash functions: Authentication requirements and functions, Message Authentication, Hash functions, security of hash functions and Macs.

UNIT 4:

Hash and MAC algorithms: MD file, message digest algorithm, secure hash algorithm

Digital signatures and authentication protocols: Digital signatures, authentication protocols, digital signature standards

UNIT 5:

Authentication applications: Kerbores, X.509 directory authentication service.

Electronic mail security: Pretty good privacy, S/MIME.

Text Books:



SKR & SKR GOVT. COLLEGE FOR WOMEN, KADAPA.
(AUTONOMOUS)

Reaccredited with 'B' Grade by NAAC
Y.S.R. Kadapa District – 516001, Andhra Pradesh, India.
Affiliated to Yogi Vemana University



2020-21

Core papers

COURSE-I

CBCS/ SEMESTER SYSTEM

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. Convert nonexact homogeneous equations to exact differential equations by using integrating factors.
3. Know the methods of finding solutions of differential equations of the first order but not of the first degree.
4. Solve higher-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 , $\frac{1}{f(D)}$ 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 $b\sin ax$ 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 .

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

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.

Co-Curricular Activities(15 Hours)

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

COURSE-II
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.

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 form 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.

B.A./B.Sc. MATHEMATICS SYLLABUS
SEMESTER – III
PAPER – III : ABSTRACT ALGEBRA

60 Hrs

UNIT – 1: (10 Hrs) 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 – 2: (14 Hrs) 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 – 3: (12 Hrs) 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 – simple group – quotient group – criteria for the existence of a quotient group.

UNIT – 4: (10 Hrs) 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 – 5: (14 Hrs) 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.

Reference Books :-

1. Abstract Algebra, by J.B. Fraleigh. Published by Narosa Publishing house.
2. 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.
3. Modern Algebra by M.L. Khanna.

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on Group theory and its applications in Graphics and Medical image Analysis

B.A./B.Sc. MATHEMATICS SYLLABUS
SEMESTER – IV
PAPER- IV : REAL ANALYSIS

UNIT – I (12 hrs) : REAL NUMBERS & INFINITE SERIES :

The algebraic and order properties of \mathbb{R} , Absolute value and Real line, Completeness property of \mathbb{R} , Applications of supremum property; intervals. Sequences and their limits, Range and Boundedness of Sequences, Limit of a sequence and Convergent sequence. (No. Question is to be set from this portion.)

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. Comparison test
2. Cauchy's n^{th} root test or Root Test.
3. D'Alembert's Test or Ratio Test.
4. Alternating Series – Leibnitz Test.

UNIT – II (12 hrs) : CONTINUITY

Limits : Limits of functions. Limits at infinity.

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

UNIT – III (12 hrs) : DIFFERENTIATION AND MEAN VALUE THEOREMS :

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 – IV (12 hrs) : RIEMANN INTEGRATION-I:

Riemann Integral, Riemann integral functions, Darboux theorem. Necessary and sufficient condition for \mathbb{R} – integrability. Another definition of Riemann integral. Some classes of bounded integrable functions.

UNIT – V (12 hrs) : RIEMANN INTEGRATION-II:

Properties of integrable functions, Fundamental theorem of integral calculus, integral as the limit of a sum, Mean value Theorems.

Reference Books :

1. Real Analysis by Rabert & Bartely and D.R. Sherbart. Published by John Wiley.
2. A Text Book of B.Sc Mathematics by B.V.S.S. Sarma and others, Published by S. Chand & Company Pvt. Ltd., New Delhi.
3. Elements of Real Analysis as per UGC Syllabus by Shanthi Narayan and Dr. M.D. Raisinghanika Published by S. Chand & Company Pvt. Ltd., New Delhi.

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on Real Analysis and its applications

Reference Books :

1. Real Analysis by Rabert & Bartely and D.R. Sherbart. Published by John Wiley.
2. A Text Book of B.Sc Mathematics by B.V.S.S. Sarma and others, Published by S. Chand & Company Pvt. Ltd., New Delhi.
3. Elements of Real Analysis as per UGC Syllabus by Shanthi Narayan and Dr. M.D. Raisinghanika Published by S. Chand & Company Pvt. Ltd., New Delhi.

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on Real Analysis and its applications

B.A./B.Sc. MATHEMATICS SYLLABUS
SEMESTER – V
PAPER – V: RING THEORY & VECTOR CALCULUS

60 Hrs

UNIT – 1 (12 hrs) RINGS-I

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.

UNIT – 2 (12 hrs) RINGS-II

Sub Rings, Ideals, Quotient Rings.

Definition of Homomorphism – Homomorphic Image – Elementary Properties of Homomorphism – Kernel of a Homomorphism – Fundamental theorem of Homomorphism.

UNIT –3 (12 hrs) VECTOR DIFFERENTIATION

Vector Differentiation, Ordinary derivatives of vectors, Differentiability, Gradient, Divergence, Curl operators, Formulae Involving these operators.

UNIT – 4 (12 hrs) VECTOR INTEGRATION

Line Integral, Surface Integral, Volume integral with examples.

UNIT – 5 (12 hrs) VECTOR INTEGRATION APPLICATIONS

Theorems of Gauss and Stokes, Green's theorem in plane and applications of these theorems.

Reference Books :-

1. Abstract Algebra by J. Fraleigh. Published by Narosa Publishing house.
2. Vector Calculus by Santhi Narayana, Published by S. Chand & Company Pvt. Ltd., New Delhi.
3. A text Book of B.Sc., Mathematics by B.V.S.S. Sarma and others, published by S. Chand & Company Pvt. Ltd., New Delhi.
4. Vector Calculus by R. Gupta, Published by Laxmi Publications.
5. Vector Calculus by P.C. Matthews, Published by Springer Verlag publications.
6. Rings and Linear Algebra by Pundir & Pundir. Published by Pragathi Prakashan.

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on Ring theory and its applications

B.A./B.Sc. MATHEMATICS SYLLABUS
SEMESTER – V
PAPER – VI : LAPLACE TRANSFORMS

60 Hrs

UNIT – 1 (12 hrs) Laplace Transform - I

Definition of - Integral Transform – Laplace Transform Linearity, Property, Piecewise continuous Functions, Existence of Laplace Transform, Functions of Exponential order, and of Class A.

UNIT – 2 (12 hrs) Laplace Transform - II

First Shifting Theorem, Second Shifting Theorem, Change of Scale Property, Laplace Transform of the derivative of $f(t)$, Initial Value theorem and Final Value theorem.

UNIT – 3 (12 hrs) Laplace Transform - III

Laplace Transform of Integrals – Multiplication by t , Multiplication by t^n – Division by t . Laplace transform of Bessel Function, Laplace Transform of Error Function, Laplace Transform of Sine and cosine integrals.

UNIT – 4 (12 hrs) Inverse Laplace Transform - I

Definition of Inverse Laplace Transform. Linearity, Property, First Shifting Theorem, Second Shifting Theorem, Change of Scale property, use of partial fractions, Examples.

UNIT – 5 (12 hrs) Inverse Laplace Transform - II

Inverse Laplace transforms of Derivatives–Inverse Laplace Transforms of Integrals – Multiplication by Powers of ‘P’– Division by powers of ‘P’– Convolution Definition – Convolution Theorem – proof and Applications – Heaviside’s Expansion theorem and its Applications.

Reference Books :-

1. Laplace Transforms by A.R. Vasistha and Dr. R.K. Gupta Published by Krishna Prakashan Media Pvt. Ltd. Meerut.
2. Fourier Series and Integral Transforms by Dr. S. Sreenadh Published by S.Chand and Co., Pvt. Ltd., New Delhi.
3. Laplace and Fourier Transforms by Dr. J.K. Goyal and K.P. Gupta, Published by Pragathi Prakashan, Meerut.
4. Integral Transforms by M.D. Raising hania - H.C. Saxsena and H.K. Dass Published by S. Chand and Co., Pvt.Ltd., New Delhi.

B.A./B.Sc. MATHEMATICS SYLLABUS
SEMESTER – VI
PAPER – VII : LINEAR ALGEBRA - I

60 Hrs

UNIT – I (12 hrs) : 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 hrs) : 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 hrs) : Linear Transformations

Linear transformations, linear operators, Properties of L.T., Determination of L.T, sum and product of L.T's Algebra of Linear Operators, Range and null space of linear transformation, Rank and Nullity of linear transformations – Rank -Nullity Theorem.

UNIT –IV (12 hrs) : Vector Space Isomorphism

Fundamental theorem of homomorphism, Singular and non –singular transformations, inverse function, Uniqueness of inverse.

UNIT –V (12 hrs) : Matrix of a Linear Transformation

Definition of Matrix of a Linear Transformation, Problems on finding the matrix of a Linear Transformation, Transition matrix and problems on transition matrix.

Reference Books :

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

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on “Applications of Linear algebra Through Computer Sciences”

B.A./B.Sc. MATHEMATICS SYLLABUS
SEMESTER – VI
Cluster Elective – Paper VIII - A1: INTEGRAL TRANSFORMS

UNIT – I (12 hrs) Application of Laplace Transform to solutions of Differential Equations :-

Solutions of ordinary Differential Equations.
Solutions of Differential Equations with constants co-efficient
Solutions of Differential Equations with Variable co-efficient

UNIT – II (12 hrs) Application of Laplace Transform :-

Solution of simultaneous ordinary Differential Equations.
Solutions of partial Differential Equations.

UNIT – III (12 hrs) Application of Laplace Transforms to Integral Equations :-

Integral Equations-Abel's, Integral Equation-Integral Equation of Convolution Type, Integro Differential Equations. Application of L.T. to Integral Equations.

UNIT – IV (12 hrs) Fourier Transforms:-

Definition of Fourier Transform – Fourier sine Transform – Fourier cosine Transform – Relationship between Fourier and Laplace transforms – Linear Property – Change of Scale Property – Modulation theorem – Derivative theorem – Shifting property – Convolution Theorem for Fourier transform – Problems related to Integral Equations – Parseval's Identity.

UNIT – V (12 hrs) Fourier Series:-

Fourier series, Fourier series in the interval $[-\pi, \pi]$, Fourier series in the interval $[0, 2\pi]$. Half range series, Fourier sine series in $[0, \pi]$, Fourier cosine series in $[0, \pi]$, Fourier series in the interval $[-l, l]$, Fourier series in the interval $[0, 2l]$, Fourier half range series in $[0, l]$.

Reference Books :-

1. Integral Transforms by A.R. Vasistha and Dr. R.K. Gupta Published by Krishna Prakashan Media Pvt. Ltd. Meerut.
 2. A Course of Mathematical Analysis by Shanthi Narayana and P.K. Mittal, Published by S. Chand and Company pvt. Ltd., New Delhi.
 3. Fourier Series and Integral Transforms by Dr. S. Sreenadh Published by S.Chand and Company Pvt. Ltd., New Delhi.
 4. Lapalce and Fourier Transforms by Dr. J.K. Goyal and K.P. Gupta, Published by Pragathi Prakashan, Meerut.
 5. Integral Transforms by M.D. Raising hanja, - H.C. Saxsena and H.K. Dass Published by S.Chand and Company pvt. Ltd., New Delhi.
 6. Fourier series and Integral Transforms by Dr.S.Sreenadh, S.Ranganatham, MVSSN Prasad.
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B.A./B.Sc. MATHEMATICS SYLLABUS
SEMESTER – VI

Cluster Elective – Paper VIII – A2 : NUMERICAL ANALYSIS

60 Hrs

UNIT- I: (12 hours)

Errors in Numerical computations and Solution of Algebraic and Transcendental Equations: Errors and their Accuracy, Mathematical Preliminaries, Errors and their Analysis, Absolute, Relative and Percentage Errors, A general error formula, Error in a series approximation. The bisection method, The iteration method, The method of false position, Newton Raphson method, Generalized Newton Raphson method.

UNIT – II: (12 hours)

Interpolation–I: Errors in polynomial interpolation, Finite Differences, Forward differences, Backward differences, Central Differences, Symbolic relations, Detection of errors by use of Differences Tables, Differences of a polynomial, Newton’s formulae for interpolation.

UNIT – III: (12 hours)

Interpolation – II: Central Difference Interpolation Formulae, Gauss’s central difference formulae, Stirling’s central difference formula.

UNIT – IV: (12 hours)

Interpolation – III: Interpolation with unevenly spaced points, Lagrange’s formula, Error in Lagrange’s formula, Divided differences and their properties, Relation between divided differences and forward differences, Relation between divided differences and backward differences Relation between divided differences and central differences, Newton’s general interpolation Formula.

UNIT – V: (12 hours)

Numerical Differentiation and Integration: Numerical differentiation, The Cubic Spline method, Numerical integration, Trapezoidal Rule, Simpson’s 1/3 Rule, Simpson’s 3/8 Rule.

Reference Books :

1. Numerical Analysis by S.S.Sastry, published by Prentice Hall of India Pvt. Ltd., New Delhi. (Latest Edition)
2. Numerical Analysis by G. Sankar Rao published by New Age International Publishers, New – Hyderabad.
3. Finite Differences and Numerical Analysis by H.C Saxena published by S. Chand and Company, Pvt. Ltd., New Delhi.
4. Numerical methods for scientific and engineering computation by M.K.Jain, S.R.K.Iyengar, R.K. Jain.



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2020-21

Core papers

B.A./B.Sc. MATHEMATICS SYLLABUS
SEMESTER – VI

Cluster Elective – Paper VIII -A3 : LINEAR ALGEBRA - II

UNIT- I: (12 hours)

Rank of a Matrix : Sub-matrix and Minors of a Matrix, Rank of a Matrix, Elementary transformations, Reduction to Normal Form, Inverse of a Matrix using elementary transformations, Echelon form.

UNIT – II: (12 hours)

Linear Equations: Consistency, System of Homogeneous Linear equations, System of Non-homogeneous Linear equations.

UNIT – III: (12 hours)

Characteristic roots and Vectors of a Square Matrix: Characteristic roots, characteristic vectors, Properties of characteristic vectors, Cayley - Hamilton Theorem, Inverse of a matrix by using Cayley - Hamilton Theorem.

UNIT –IV (12 hrs) : Inner product space - I

Inner product spaces, Euclidean and unitary spaces, Norm or length of a Vector, Schwartz inequality, Triangle in Inequality, Parallelogram law.

UNIT –V (12 hrs) : Inner product space - II

Orthogonality, Ortho normal set, complete ortho-normal set, Gram – Schmidt orthogonalisation process. Bessel's inequality and Parseval's Identity.

Reference Books :

1. Linear Algebra by J.N. Sharma and A.R. Vasista, published by Krishna Prakashan Mandir, Meerut-250002.
2. Linear Algebra by Kenneth Hoffman and Ray Kunze, published by Pearson Education (low price edition), New Delhi.
3. Linear Algebra by Stephen H. Friedberg et al published by Prentice Hall of India Pvt. Ltd. 4th Edition 2007.
4. A Text Book on Matrices by P.K Mittal, S.Chand Co.
5. A Text Book on Matrices by A.R. Vasistha, A.K.Vasistha, Krishna Prashan Media.
6. A Text Book on Matrices by Santhi Narayan, S.Chand Co.



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2021-22

Core papers

ZOOLOGY

ZOOLOGY SYLLABUS FOR I SEMESTER

PAPER – I: ANIMAL DIVERSITY – BIOLOGY OF NONCHORDATES

HOURS:60 (5X12)

Max. Marks: 100

UNIT I

- 1.1 Principles of Taxonomy – Binomial nomenclature – Rules of nomenclature
- 1.2 Whittaker's five kingdom concept and classification of Animal Kingdom.

Phylum Protozoa

- 1.3 General Characters and classification of protozoa up to classes with suitable examples
- 1.4 Protozoan – Pathogenicity (Trypanosoma, Plasmodium, Giardia, Leishmania, Trichomonas – causative agent, mode of infection, symptoms, Prevention and Controlling measures)
- 1.5 *Elphidium* (type study)

UNIT –II

Phylum Porifera

- 2.1 General characters and classification up to classes with suitable examples
- 2.2 Skelton in Sponges
- 2.3 Canal system in sponges

Phylum Coelenterata

- 2.4 General characters and classification up to classes with suitable examples
- 2.5 Metagenesis in *Obelia*
- 2.6 Polymorphism in coelenterates
- 2.7 Corals and coral reefs

Phylum Ctenophora :

- 2.8 General Characters and Evolutionary significance (affinities)

Unit – III

Phylum Platyhelminthes

- 3.1 General characters and classification up to classes with suitable examples
- 3.2 Life cycle and pathogenicity of *Fasciola hepatica*
- 3.3 Parasitic Adaptations in helminthes

Phylum Nematelminthes

- 3.4 General characters and classification up to classes with suitable examples
- 3.5 Life cycle and pathogenicity of *Ascaris lumbricoides*

Unit – IV

Phylum Annelida

- 4.1 General characters and classification up to classes with suitable examples
- 4.2 Evolution of Coelom and Coelomoducts
- 4.3 Vermiculture - Scope, significance, earthworm species, processing, Vermicompost, economic importance of vermicompost

Phylum Arthropoda

- 4.4 General characters and classification up to classes with suitable examples
- 4.5 Vision and respiration in Arthropoda
- 4.6 Metamorphosis in Insects
- 4.7 *Peripatus* - Structure and affinities
- 4.8 Economic Impotance of insects- Silkworms, Honey bee and Lac insect.

Unit – V

Phylum Mollusca

- 5.1 General characters and classification up to classes with suitable examples
- 5.2 Pearl formation in Pelecypoda
- 5.3 Sense organs in Mollusca

Phylum Echinodermata

- 5.4 General characters and classification up to classes with suitable examples
- 5.5 Water vascular system in star fish
- 5.6 Larval forms of Echinodermata

Phylum Hemichordata

- 5.7 General characters and classification up to classes with suitable examples

5.8 *Balanoglossus* - Structure and affinities

Unit - III

- 3.1 General characters of Amphibia
- 3.2 Classification of Amphibia up to orders with examples.
- 3.3 *Rana hexadactyla*: External features, Digestive system, Respiratory system, Structure and function of Heart, structure and functions of the Brain
- 3.4 Reptilia: General characters of Reptilia, Classification of Reptilia up to orders with examples
- 3.5 *Calotes*: External features, Digestive system, Respiratory system, Structure and function of Heart, structure and function of Brain
- 3.6 Identification of Poisonous and **Non-poisonous snakes**.

Unit - IV

- 4.1 Aves General characters and classification (**Ratitae and Carinatae**)
- 4.2 *Columba livia*: External features, Digestive system, Respiratory system, Structure and function of Heart, structure and function of Brain
- 4.3 Migration in Birds
- 4.4 Flight adaptation in birds

Unit - V

- 5.1 General characters of Mammalia
- 5.2 Classification of Mammalia upto sub - classes with examples
- 5.3 Comparison of Prototherians, Metatherians and Eutherians
- 5.4 Dentition in mammals

Co-curricular activities (suggested)

- Preparation of charts on Chordate classification (with representative animal photos) and retrogressive metamorphosis
- Thermocol or Clay models of Herdmania and Amphioxus
- Visit to local fish market and identification of local cartilaginous and bony fishes
- Maintaining of aquarium by students
- Thermocol model of fish heart and brain
- Preparation of slides of scales of fishes
- Visit to local/nearby river to identify migratory fishes and prepare study notes
- Preparation of Charts on above topics by students (Eg: comparative account of vertebrate heart/brain/lungs, identification of snakes etc.)
- Collecting and preparation of Museum specimens with dead frogs/snakes/lizards etc., and/or their skeletons
- Additional input on types of snake poisons and their antidotes (student activity).
- Collection of bird feathers and submission of report on Plumology



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Core papers

ZOOLOGY SYLLABUS FOR III SEMESTER

ZOOLOGY - PAPER - III

CYTOLOGY, GENETICS AND EVOLUTION

Periods:60

Max. Marks:100

Unit - I

1. Cytology - I

Definition, history, prokaryotic and eukaryotic cells, virus

Electron microscopic structure of eukaryotic cell.

Plasma membrane –Different models of plasma membrane.

Unit – II

2. Cell organelles

Structure and functions of Endoplasmic Reticulum

Structure and functions of Golgi apparatus

Structure and functions of Lysosomes

Structure and functions of Ribosomes

Structure and functions of Mitochondria

2.7. Chromatin, Chromosomes - Structure, types, functions

Unit - III

Genetics - I

Mendel's work on transmission on traits

Principles of inheritance

Incomplete dominance and codominance

Lethal alleles, Epistasis, Pleiotropy

Unit - IV

Genetics - II

Sex determination

Sex linked inheritance

Linkage and crossing over

Extra chromosomal inheritance

Human karyotyping

Unit - V

Evolution

Lamarckism, Darwinism, Hardy-Weinberg Equilibrium.

Variations, isolating mechanisms, natural selection

Speciation (Allopatric and Sympatric)

Macro evolutionary principles (Example: Darwin's finches)

ZOOLOGY PRACTICAL SYLLABUS FOR III SEMESTER

ZOOLOGY - PAPER - III

CYTOLOGY, GENETICS AND EVOLUTION

Periods: 24

Max. Marks: 50

I. Cytology

1. Preparation of temporary slides of Mitotic divisions with onion root tips
2. Observation of various stages of Mitosis and Meiosis with prepared slides
3. Mounting of salivary gland chromosomes of Chironomous

II. Genetics

1. Study of Mendelian inheritance using suitable examples
2. Study of linkage recombination, gene mapping using the data
3. Study of human karyotypes

III. Evolution

1. Study of fossil evidences
2. Study of homology and analogy from suitable specimens and pictures
3. Phylogeny of horse with pictures
4. Darwin's finches (pictures)
5. Visit to natural history museum and submission of report

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Core papers



ZOOLOGY SYLLABUS FOR IV SEMESTER

ZOOLOGY - PAPER - IV

EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

Periods:60

Max. Marks: 100

Unit - I

Developmental Biology and Embryology

Gametogenesis

Types of eggs

Formation and functions of Foetal membrane in chick embryo

Development, types and functions of Placenta in mammals

Unit - II

Physiology - I

Elementary study of process of digestion

Absorption of digested food

Respiration - Pulmonary ventilation, transport of oxygen and carbondioxide

Circulation - Structure and functioning of heart, Cardiac cycle

Excretion - Structure of nephron, urine formation, counter current mechanism

Unit - III

Physiology - II

Nerve impulse transmission, origin and propagation of action potentials

Muscle contraction - Ultra structure of muscle fibre, molecular and chemical basis of muscle contraction

Endocrine glands - Structure, secretions and the functions (of hormones) of pituitary, thyroid, parathyroid, adrenal glands and pancreas

Hormonal control of reproduction in a mammal

Unit - IV

Ecology - I

Meaning and scope of Ecology

Nutrient cycles - Nitrogen, carbon and phosphorus

Components of Ecosystem (Example:lake), food chains and food web, energy flow in ecosystem

Unit - V

Ecology - II

Habitat and ecological niche

Community interactions - Mutualism, commensalism, parasitism, competition, predation



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Ecological succession

Zoogeography

Zoogeographical regions

Study of physical and faunal peculiarities of Oriental, Australian and Ethiopian regions

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ZOOLOGY PRACTICAL SYLLABUS FOR IV SEMESTER

ZOOLOGY - PAPER - IV

EMBRYOLOGY, PHYSIOLOGY AND ECOLOGY

Periods: 24

Max. Marks: 50

I. Embryology

1. Study of T.S. of testis, ovary of a mammal
2. Study of different stages of cleavages (2, 4, 8 cell stages)
3. Study of chick embryos of 18 hours, 24 hours, 33 hours and 48 hours of incubation

II. Physiology

1. Qualitative tests for identification of carbohydrates, proteins and fats
2. Qualitative tests for identification of ammonia, urea and uric acid
3. Study of activity of salivary amylase under optimum conditions
4. Study of prepared slides of T.S. of duodenum, liver, lung, kidney, spinal cord, bone and cartilage

III. Ecology

1. Determination of pH of given sample
2. Estimation of dissolved oxygen of given sample
3. Estimation of total alkalinity of given sample
4. Estimation of salinity of given sample

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Core papers



ZOOLOGY SYLLABUS FOR V SEMESTER

ZOOLOGY - PAPER - V
ANIMAL BIOTECHNOLOGY

Periods:60

Max. Marks:100

Unit 1: Tools of Recombinant DNA technology - Enzymes and Vectors
Restriction modification systems: Types I, II and III. Mode of action, nomenclature, applications of Type II restriction enzymes in genetic engineering
Cloning Vectors: Plasmid vectors; pBR and pUC series, Bacteriophage, Cosmids.

Unit 2 Techniques of Recombinant DNA technology
Cloning: Use of linkers and adaptors
PCR: Basics of PCR.
Hybridization techniques: Southern, Northern and Western blotting,
Genomic and cDNA libraries: Preparation and uses

UNIT 3 Animal Cell Technology
Cell cultures: primary culture, secondary culture, Organ culture; Cryopreservation of cultures.
Hybridoma Technology: Production of Monoclonal antibodies (mAb), Applications of mAb Stem cells: Types of stem cells, applications of stem cell technology in cell based therapy.

Unit 4 Reproductive Technologies & Transgenic Animals
Manipulation of reproduction in animals: Artificial Insemination, In vitro fertilization, super ovulation, Embryo transfer
Transgenic Animals: Transgenic - sheep, - fish; applications

Unit 5 Applied Biotechnology
Industry: Fermentation: Different types of Fermentation: Short notes on - Submerged & Solid state; batch, Fed batch & Continuous;
Agriculture: fisheries – monoculture in fishes, polyploidy in fishes; DNA fingerprinting

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ZOOLOGY SYLLABUS FOR V SEMESTER

ZOOLOGY - PAPER - VI

ANIMAL HUSBANDRY

Periods:60	Max. Marks: 100
UNIT – I	10 Hours
<u>General introduction</u> to poultry farming. Principles of poultry housing. Poultry houses. <u>Systems of poultry farming</u> . Management of chicks, growers and layers. Management of Broilers.	
UNIT – II:	10 Hours
Poultry feed management – Principles of feeding. Methods of feeding. Poultry <u>diseases</u> – viral, bacterial, fungal and parasitic (two each); symptoms, control and management.	
UNIT – III:	10 Hours
Selection, care and handling of hatching eggs. Egg testing. Methods of hatching. Brooding and rearing. Sexing of chicks.	
UNIT- IV:	20 Hours
Breeds of Dairy Cattle and Buffaloes – Definition of breed; Classification of Indian Cattle breeds, exotic breeds and Indian buffalo breeds. (Three each category). Housing of <u>dairy animals</u> – Selection of site for dairy farm; systems of housing – loose, housing system. Conventional dairy barn. Cleaning and sanitation of dairy farm. Weaning of calf. <u>Castration and</u> dehorning. Deworming.	
UNIT - V:	10 Hours
Care and management of dairy animals - Care and management of calf, heifer, milk animal, dry and pregnant animal, bulls and bullocks.	



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Core papers

ZOOLOGY SYLLABUS FOR VI SEMESTER

ZOOLOGY -ELECTIVE PAPER:VII

IMMUNOLOGY

Periods:60

Max. Marks:100

Unit - I

Overview of Immune system
Introduction to basic concepts in Immunology
Innate and adaptive immunity
Cells and organs of Immune system
Cells of immune system
Organs of immune system

Unit - II

Antigens
Basic properties of antigens
B and T cell epitopes, ~~haptens~~
Factors influencing immunogenicity

Unit - III

Antibodies
Structure of antibody
Classes and functions of antibodies
3.1.3 Monoclonal antibodies

Unit - IV

Working of Immune system
Structure and functions of major histocompatibility complexes
~~Exogenous and Endogenous~~ pathways of antigen presentation and processing
Basic properties and functions of cytokines

Unit - V

Immune system in health and disease
Classification and brief description of various types of hyper sensitivities
Introduction to concepts of autoimmunity and immunodeficiency
Vaccines
General introduction to vaccines
Types of vaccines

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VI SEMESTER
ZOOLOGY SYLLABUS FOR CLUSTER ELECTIVE –VIII-A:
AQUACULTURE

Cluster Elective Paper: VIII-A-1

PRINCIPLES OF AQUACULTURE

Periods:60

Max.Marks:100

Unit – I

Introduction / Basics of Aquaculture
Definition, Significance and History of Aquaculture
Major cultivable species for aquaculture: freshwater, brackish water and marine.
Criteria for the selection of species for culture

Unit – II

Types of Aquaculture
Freshwater, Brackishwater and Marine
Concept of Monoculture, Polyculture, Composite culture, Monosex culture
and Integrated fish farming
Culture practices
Traditional, extensive, modified extensive, semi-intensive and intensive
cultures of fish.

Unit – III

Design and construction of aquafarms
Criteria for the selection of site for freshwater and brackish water pond farms
Design and construction of fish and shrimp farms
Nutrition and feeds
Natural food and Artificial feeds and their importance in fish and shrimp culture

Unit – IV

Management of carp culture ponds
4.1.1 Culture of Indian major carps: Pre-stocking management – Dewatering, drying,
ploughing/desilting; Predators, weeds and algal blooms and their control, Liming and
fertilization; Stocking management – Stocking density and stocking; Post-stocking
management – Feeding, water quality, growth and health care; and Harvesting of ponds.

Unit – V

Culture of shrimp (*Penaeus monodon* or *Litopenaeus vannamei*)
Culture of pearl oysters
Culture of ornamental fishes – Setting up and maintenance of aquarium.

REFERENCES BOOKS

1. Bardach, JE et al. 1972. Aquaculture – The farming and husbandry of freshwater and marine organisms, John Wiley & Sons, New York.
2. Bose AN et al. 1991. Coastal aquaculture Engineering. Oxford & IBH Publ Co. Pvt Ltd.
3. Chakraborty C & Sadhu AK. 2000. Biology Hatchery and Culture Technology of Tiger Prawn and Giant Freshwater Prawn. Daya Publ. House.
4. FAO. 2007. Manual on Freshwater Prawn Farming.
5. Huet J. 1986. A text Book of Fish Culture. Fishing News Books Ltd.
6. ICAR. 2006. Hand Book of Fisheries and Aquaculture. ICAR.
7. Ivar LO. 2007. Aquaculture Engineering. Daya Publ. House.



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Core papers

Cluster Elective Paper: VIII-A-2

AQUACULTURE MANAGEMENT

Periods : 60

Max.Marks : 100

Unit – I

Breeding and Hatchery Management

Bundh Breeding and Induced breeding of carp by Hypophysation:
and use of synthetic hormones

Types of fish hatcheries; Hatchery management of Indian major carps
Breeding and Hatchery management of *Penaeus monodon*

Unit – II

Water quality Management

Water quality and soil characteristics suitable for fish and shrimp culture
Identification of oxygen depletion problems and control mechanisms in culture ponds
Liming materials, Organic manures and Inorganic fertilizers commonly used and their
implications in fish ponds

Unit – III

Feed Management

Live Foods and their role in shrimp larval nutrition.
Supplementary feeds: Principal foods in artificial diets; Types of feeds; Feed additives
and Preservatives; role of probiotics.
Feed formulation and manufacturing; Feed storage

Unit – IV

Disease Management

Principles of disease diagnosis and health management;
Prophylaxis, Hygiene and Therapy of fish diseases
Etiology, Symptoms, prophylaxis and therapy of common fish diseases in fish ponds



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Core papers

Cluster Elective Paper: VIII-A-3

POST HARVEST TECHNOLOGY

Periods : 60

Max.Marks : 100

Unit – I

Handling and Principles of fish Preservation

Handling of fresh fish, storage and transport of fresh fish, post mortem changes (rigor mortis and spoilage).

Principles of preservation– cleaning, lowering of temperature, rising of temperature, denudation, use of salt, use of fish preservatives, exposure to lowradiation of gamma rays.

Unit – II

Methods of fish Preservation

Traditional methods - sun drying, salt curing, pickling and smoking.

Advanced methods – chilling or icing, refrigerated sea water, freezing, canning, Irradiation and Accelerated Freeze drying (AFD).

Unit – III

Processing and preservation of fish and fish by-products

Fish products – fish minced meat, fish meal, fish oil, fish liquid (ensilage), fish protein concentrate, fish chowder, fish cake, fish sauce, fish salads, fish powder, pet

food from trash fish, fish manure.

Fish by-products – fish glue, ising glass, chitosan, pearl essence, shark fins, fish leather and fish maws.

Unit – IV

Sanitation and Quality control

Sanitation in processing plants - Environmental hygiene and Personal hygiene in processing plants.

Quality Control of fish and fishery products – pre-processing control, control during processing and control after processing.

Unit – V

Quality Assurance, Management and Certification

Seafood Quality Assurance and Systems: Good Manufacturing Practices (GMPs); Good Laboratory Practices (GLPs); Standard Operating Procedures (SOPs); Concept of Hazard Analysis and Critical Control Points (HACCP) in seafood safety.



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2020-21

Core papers

Tourism and Travel Management DEPARTMENT OF TOURISM AND TRAVEL
MANAGEMENT

PAPER: -1 - BASICS OF TOURISM

SEMESTER - I

Unit:-1:- Tourism Definition - Nature and Scope - History of Tourism and its developments - Types of Tourism, domestic and International tourism- Causes of rapid growth of tourism.

Unit:-II: - Travel and travellers in Ancient India - growth and development of tourism in India- travel during medieval age- European trade links - tourism in independent India - Constitutional provision of Indian Tourism.

Unit:-III: Socio- Economic Significance of tourism, Tourism as an Industry ancillary industries in tourism- Tourism organizations, National and International- role of State and Central Governments in promotion and development of tourism.

Unit:-IV: Demand and supply in tourism - need for measuring tourism - general problems of measurement importance of tourist statistics - types of tourist-statistic-methods of measurement tourism demand.

Unit:-V: Structure of State and Central tourism department and tourism development corporation tourism promotion councils and etc., - district tourism promotion councils.



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Core papers

Tourism and Travel Management DEPARTMENT OF TOURISM AND TRAVEL
MANAGEMENT

Paper-II: PRINCIPLES AND PRACTICES OF TOURISM

SEMESTER – II

Module 1

Tourism development and state intervention National economic goals-political legislation, equity and social needs, social investment, regulation and government controls, regional development in Tourism-

Module 2

Tourist motivation Factors types Push and Pull factors - Determinants of tourism- Theories of Motivation - psychological, cultural, economic, personal and social barriers to travel

Module 3

Impact of tourism Meaning, positive and negative Social, cultural, economic and environmental impacts of tourism - Employment and Revenue generation Tourist impact analysis

Module 4

Components of Tourism- Types of transportation Railways, airways, waterways and roadways Role of railways in promoting tourism in India Accommodation and food

Module 5

Tourism finance Introduction, meaning, nature, scope and functions of finance Application of financial management in tourism industry Tourism Finance Corporation of India and other Organizations Aims, objectives and functions

References:

- 1. Pran Nath Seth (2006): Successful tourism Management, Sterling, New Delhi (Vol. 1 & 2)**
- 2. Mill and Morrison, (1992). The Tourism System: An Introductory Text, Prentice**

Hall. London

3. Cooper. Fletcher et al. (1993). Tourism Principles and Practices. Pitman.

4. Bhatia, A.K. (2010): International Tourism Management, Sterling, New Delhi 5.

Burkart and Medlik. (1981). Tourism: Past, Present and Future. Heinemann,

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7. Christopher.J. Hollway: Longman (2012): The Business of Tourism. Pearson.

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2. **SarkarH,museumsandprotectionsofmonumentsandantiquities inIndia.**
3. **Vijayalakshmik.shistorytourism.**
4. **WilliamsS(1998)Tourismgeography,routledge,london.WWW.Unwto.org.**
5. **http://www.buzzle.com**
6. **www.international.icomos.org**
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8. **www.pondiuni.edu.in**
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10. **www.amazon.in**



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Core papers
Tourism and Travel Management

DEPARTMENT OF TOURISM & TRAVEL MANAGEMENT

Semester IV – Syllabus

Paper IV:- CULTURAL TOURISM IN ANDHRA PRADESH

Module -1

Definition to History and culture (Tangible and Intangible) – Brief History of –
Sailent Features of A.P Culture

Module - 2

Pre and Proto History – Art and Architecture of A.P as Tourism Products –
Major Museums and Art Galleries – Major pilgrim Centers (Temple, Church and Mosque) in A.P

Module -3

Performing Arts and Handicrafts – Andhra Paintings and Stone Crafts – Music and
Dance (Tribal, Folk and Classical)

Module -4

Language and Literature – Dress and Ornaments – Food (cuisine) and Health
(Medical Systems)

Module -5

Tribal Culture of A.P – Tribes of A.P – Geographical spread – Identity – Society – Economy –
Religion and Culture – Need for Conservation of Cultural heritage – UNESCO Initiatives –
Field Visits.

References:

APTDC Publications

Sivanagi Reddy, E, - Andhra Pradesh Tourism Vanarulu – Avakasalu
(Telugu), Hyderabad, 2003

www.aptdc.gov.in

www.aptourism.gov.in

www.tavell.in/Andhra



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2020-21

Core papers

Tourism and Travel Management

Paper-V: GUIDING AND INTERPRETATION SKILLS FOR TOURISM

SEMESTER – V

Module 1

Introduction to Guiding and escorting- Meaning; concept and types of tour guide, duties and responsibilities of Guides and Escorts, various role of tour guide, the business of guiding, organizing a guiding business

Module 2

The guiding techniques- leadership and social skills, presentation and communication skills - The guide's personality - working with different age groups, working under difficult circumstances

Module 3

Guest Relationship Management- Handling emergency situations- medical, personal, official, VISA/passport, Death, handling guest with special needs/different abilities; Skills required for adventure tours; Knowledge of local security, route chart; Personal hygiene and grooming, tour responsibilities, checklist, leading a group, code of conduct

Module 4

Conducting tours: Pre tour planning, modes of transportation, conducting various types of tours, understanding client needs, security measures, relationship with fellow guides, Coordination with hospitality institutions; points to remember while guiding and escorting

Module 5

Professional development; Interpretative planning; training staff for interpretation; evaluation techniques; negotiation skills-types of negotiating techniques; negotiating a business deal in tourism.

References:

1. Jagmohan Negi (2006); Travel Agency and Tour Operations, Kanishka Publishers, New Delhi

2. Mohinder Chand (2009); Travel Agency and Tour Operations: An Introductory Text ,Anmol Publications Pvt. Limited, New Delhi
3. Dennis L Foster - Introduction to Travel Agency Management 4. Pat Yale(1995); Business of Tour Operations, Longman Scientific & Technical, New Delhi
5. Pond K-L(1993); The professional guide: Dynamics of tour guiding
6. www.tourism.gov.in
7. www.qtic.com
8. www.cedeop.europa.eu



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2020-21

Core papers

DEPARTMENT OF TOURISM & TRAVEL MANAGEMENT

Semester V Syllabus

Paper - 6- TRAVEL AGENCY AND TOUR OPERATION BUSSINESS

Module - 1

Introduction to travel trade –origin and history of travel agencies–responsibilities and functions of travel agents–sources of income of a travel agent– setting up of travel agency.

Module - 2

Travel agency and tour operations –difference between travel agents and tour operator– linkages and arguments with hotel travel agencies and air lines– tour escorts and guides.

Module - 3

Organization structure of a travel agency – information counseling, ticketing document, lesioning. Staffing, directing, organizing and controlling.

Module - 4

Organization of tour operation– concept and nature of tour operation –functions –types of tour operations and of tour operators

Module - 5

Tourism practical (few examples are given above the faculty can include many more items

Travel agency management

1.Filling up of pass port applications from

2.Filling up of sample Visa forms

3.knowledge of visas various countries

4. Ticket booking using online travel seats

Tour operations

1. preparation of tour Itinerary – In bound and out bound

2. model costing of tour packages

3. preparation of special interest tours in your region

4. sample tour grocery steady and preparations

5. vouchers preparation and filling

6. visit to travel / tour company.

References

1. Jag Negimohan (2006)., Travel agency and tour operations ,kanishka publishers ,New Delhi.

2. Mohandar chand (2009)., Travel agency and tour operations :and introduction text ,amol publication pvt .limited ,New Delhi.

3. Jane archer ,(2006)., Manule of travel agency practice – Butterworth Heinemann, pub, London

4. <https://www.tichk.org>

5. www.growourregion.com.

6. www.usaidg.gov.com

Transportation management

- 1. Ticket booking for Indian railways using IRCTC and bus services like red bus**
- 2. Study and simple costing of vehicle rates for package tours –cars, medium, size vehicles and buses**

Hospitality Management

- 1. case study of important hotel properties**
- 2. practical accepts of bed making**
- 3. service etiquette**
- 4. Venue card preparation**
- 5. visit to hotels/resorts**

References:

- 1. Ravi Shankar (2002)., service marketing, excel books India. New Delhi**
- 2. Phillips Kolter, Bowens and James makes (2010)., marketing for tourism and hospitality, Pearson, New Delhi.**
- 3. Naresh Malhotra (2000); Marketingresearch, person prentice Hall, New Delhi**
- 4. Janet Macdonald (2000), Travel writing. RobberHale, London**
- 5. www.ilo.org**
- 6. <https://ringinstitute.com>**
- 7. <https://alison.com>**



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2020-21

Core papers

Horticulture

Semester-I Paper-I

CBCS / Semester System (w.e.f. 2020-'21 Admitted Batch)

I Semester /Horticulture Core Course - I

Fundamentals of Horticulture and Soil Science

(Total hours of teaching – 60 @ 04 Hrs./Week)

Theory :

Learning Outcomes: On successful completion of this course, the students will be able to:

- Understand the scope and potential of horticulture products in India and Andhra Pradesh.
- Classify the horticulture plants based on soil and climate.
- Illustrate different systems of planting in orchard and predict the number of plants in a given land.
- Demonstrate the methods and types of training and pruning.
- Explain the basics of soil science and justify the role of soil as a medium for plant growth.
- Explain about integrated nutrient management and demonstrate the skills of soil testing.

Unit I : Introduction to Horticulture

12 Hrs.

1. Horticulture: Definition, importance of horticulture in terms of economy, production, employment generation, environmental protection and human resource development.
2. Divisions of horticulture with suitable examples and their importance.
3. Area, production of Horticultural crops in A.P. and India.
4. Fruit and vegetable zones of India and Andhra Pradesh.
5. Export scenario and scope for Horticulture in India.

Unit II : Classification Horticulture Crops

12 Hrs.

1. Classification of horticultural crops based on soil and climatic requirements.
2. Vegetable crop gardens – Nutrition and kitchen garden – tracer garden – vegetable forcing – market garden – roof garden.
3. Gardens in floriculture – flower gardens – soil and mixed gardens; land scape Horticulture.

Unit III :Characteristics of Orchards**12 Hrs.**

1. Orchard: Definition, different systems of planting orchards – square, rectangular Quincunx, hexagonal and contour.
2. Calculation of planting densities in different systems of planting.
3. Different types and methods of pruning.
4. Training: Definition, principles and objectives; merits and demerits of open and close centered, and modified leader systems.

Unit IV :Physico-chemical characteristics of Soil**12 Hrs.**

1. Soil: Definition, minerals and weathering to form soils; factors of soil formation.
2. Soil taxonomy; soil color, texture and structure; other physical properties and stability.
3. Soil colloids and charges; ion adsorption and exchange; soil temperature and soil air.
4. Soil pH and acidity; soil alkalinity and salinity.

Unit V :Soil as a living matter**12 Hrs.**

1. Soil organic matter – composition and decomposability.
2. Humus – fractionation of organic matter.
3. Soil biology: Soil microorganisms and fauna –beneficial and harmful roles.
4. Integrated nutrient management and soil tests.

Text books:

- **Prasad and Kumar ,2014.**: Principles of Horticulture 2nd Edition Agribios India
 - **Kumar, N., 1990** Introduction to Horticulture. Rajyalakshmi Publications, Nagarkoil, Tamilnadu
 - **Jithendra Singh, 2002.** Basic Horticulture. Kalyani Publishers, Hyderabad
 - **KausalkumarMisra and Rajesh Kumar, 2014** Fundamentals of Horticulture
-



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2020-21

Core papers

Horticulture

II Semester /Horticulture Core Course - 2
Plant Propagation and Nursery Management
(Total hours of teaching – 60 @ 04 Hrs./Week)

Theory :

Learning Outcomes: On successful completion of this course, the students will be able to:

- Explain sexual and asexual propagation methods of plants.
- Demonstrate skills on vegetative propagation of plants.
- Demonstrate the techniques on raising of different types of nursery beds
- Justify the role of various propagation structures used to raise horticulture plants.
- Understand the regulation to establish a plant nursery and quality parameters to be maintained.
- Implement different routine/regular activities in a nursery.
- Understand the economics of a plant nursery and can maintain necessary records.

Unit -1: Sexual propagation

12 Hrs.

1. Sexual propagation – advantages and disadvantages.
2. Seed germination, process of seed germination; factors affecting seed germination;
3. Pre-germination treatments and viability tests; sowing methods of seeds.
4. Polyembryony in propagation of *Opuntia*, trifoliate orange, mango and *Citrus*.

Unit -2: Asexual propagation

12 Hrs.

1. Asexual propagation – advantages and disadvantages.
2. Using bulbs, corms, tubers and rhizomes to raise nursery.
3. Stolons, runners and offsets in raising nursery.
4. Apomixis : Definition; role of apomictics in propagation of apple, mangosteen and *Citrus*.

Unit- 3 : Vegetative propagation techniques

12 Hrs.

1. Cuttings: Definition, propagation by root, leaf and stem cuttings.
2. Layering : Definition, techniques of simple, serpentine, mound, trench and air layering.
3. Grafting : Definition; approach and detached scion (Veneer, whip, cleft, side and bark) grafting techniques.
4. Budding : Definition; techniques of T-, patch and chip budding.

Unit – 4 :Basic requirements of a nursery

12 Hrs.

1. Plant nursery: Definition, importance; Basic facilities for a nursery; layout and components of a good nursery.
2. Nursery beds – types, their merits and demerits; precautions to be taken during preparation.
3. Brief account of growing media; nursery tools and implements.
4. Containers for plant nursery.
5. Brief account of plant propagation structures.

Unit -5: Nursery management

12 Hrs.

1. Bureau of Indian Standards (BIS-2008) related to nursery; guidelines for nursery raising.
2. Nursery accreditation and Certification.
3. Seasonal activities and routine operations in a nursery; watering, weeding and control of pests and diseases.
4. Common possible errors in nursery activities.
5. Economics of nursery development and record maintenance; online nursery information and sales systems.



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AUTONOMOUS SYLLABUS

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2020-2021



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DEPARTMENT OF ENGLISH



FIRST SEMESTER

MA English

2020-2021

With effect from 2020 - 21 (Under CBCS Pattern)

ENG 101: POETRY-I

UNIT – 1

Background Study

Literary History – Genres – Movements – Ideas – Trends - Concepts

UNIT – 2

- 1. Chaucer : The Prologue to the Canterbury Tales (The Knight,
The Square, The Wife of Bath, The Friar)**
- 2. John Donne : The Flea,
The Canonization,
The Sunrising**

UNIT – 3

- 3. Milton : Paradise Lost, Book II**
- 4. Alexander Pope : The Rape of the Lock (canto I and II)**
- 5. Thomas Gray : Elegy Written in a Country Church Yard**

UNIT – 4

- 6. Wordsworth : Tintern Abbey, Ode on Intimations of Immortality**
- 7. John Keats : Ode to a Nightingale, Ode on a Grecian Urn**
- 8. P.B. Shelley : Ode to the West Wind,
The Cloud**



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DEPARTMENT OF ENGLISH

FIRST SEMESTER

MA English

2020-2021

With effect from 2020 - 21 (Under CBCS Pattern)

ENG 102: DRAMA-I

UNIT – 1

Background Study

Literary History – Genres – Movements – Ideas – Trends – Concepts

UNIT – 2

1. Christopher Marlowe : Edward-II

2. Ben Jonson : Volpone

UNIT – 3

3. William Shakespeare : Hamlet

4. William Shakespeare : The Merchant of Venice

UNIT – 4

5. Sheridan : The School for Scandal

6. Oscar Wilde : The Importance of Being Earnest



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DEPARTMENT OF ENGLISH

FIRST SEMESTER

MA English

2020-2021

With effect from 2020 - 21 (Under CBCS Pattern)

ENG 103: FICTION-I

UNIT – 1

Background Study

Literary History – Genres – Movements – Ideas – Trends – Concepts

UNIT – 2

1. Daniel Defoe : Robinson Crusoe

2. Henry Fielding : Tom Jones

UNIT – 3

3. Jane Austen : Pride and Prejudice

4. George Eliot : The Mill on the Floss

UNIT – 4

5. Charles Dickens : A Tale of Two Cities

6. Thomas Hardy : The Mayor of Casterbridge



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DEPARTMENT OF ENGLISH

FIRST SEMESTER

MA English

2020-2021

With effect from 2020 - 21 (Under CBCS Pattern)

ENG 104: PROSE-I

UNIT – 1

Background Study

Literary History – Genres – Movements – Ideas – Trends – Concepts

UNIT – 2

1. Francis Bacon : Of Studies, Of Truth, Of Youth and Age

2. Joseph Addison : The Coverley Papers (Selected Essays)

1. The Mischief's of the Club

2. Labour and Exercise

3. Rural Manner

UNIT – 3

1. Jonathan Swift : Gulliver's Travels Voyage I& II

2. Charles Lamb : 1. Dream Children

2. The South-Sea House

UNIT – 4

1. Milton : Of Education

2. Bertrand Russell: The Conquest of Happiness



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DEPARTMENT OF ENGLISH

MA English

2020-2021

FIRST SEMESTER

ENG 105: ENGLISH LANGUAGE

UNIT – 1

Language – Definition – features – Human Language vs. Animal

Language - Definition and Scope of Linguistics - Dimensions of Study.

UNIT – 2

1. Origin and Growth of English Language – Influences (Latin, French, and Indian) – Standard English – British and American English

UNIT – 3

Sounds – Speech Mechanism – Stress/ Rhythm – Intonation – Phones – Phonemes – Allophones.

UNIT – 4

Morphology – Morphs – Allomorphs – Word formation processes – Simple, Complex and Compound Words.



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DEPARTMENT OF ENGLISH

SECOND SEMESTER

MA English

2020-2021

With effect from 2020 - 21 (Under CBCS Pattern)

ENGLISH 201: POETRY – II

UNIT – I

Background Study

**Literary History – Genres – Movements – Ideas – Trends -
Concepts**

UNIT – 2

- 1. Robert Browning : My Last Duchess**
- 2. G.M. Hopkins : Wind Hover, Pied Beauty**
- 3. Matthew Arnold : Dover Beach**

UNIT – 3

- 3. W.B. Yeats : The Second Coming, Byzantium,
A Prayer for my daughter**
- 4. T.S. Eliot : The Waste Land**

UNIT – 4

- 5. W.H. Auden : The Unknown Citizen,
The Shield of Achilles**
- 6. Alexander Pope : The Happy Man**
- 7. John Milton : On His Having arrived at the Age of
Twenty Three.**



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DEPARTMENT OF ENGLISH

SECOND SEMESTER

MA English

2020-2021

With effect from 2020 - 21 (Under CBCS Pattern)

PAPER II: DRAMA – II

ENGLISH 202

UNIT - I

Background Study

Literary History – Genres – Movements – Idea – Trends – Concepts

UNIT – 2

- 1. G.B. Shaw : St. Joan**
- 2. T S Eliot : The Murder in the Cathedral**

UNIT – 3

- 3. John Osborne : Look Back in Anger**
- 4. Harold Pinter : The Birthday Party**

UNIT – 4

- 5. Samuel Beckett : Waiting for Godot**
- 6. J.M. Synge : Riders to the Sea**



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DEPARTMENT OF ENGLISH

**SECOND SEMESTER
MA English**

2020-2021

With effect from 2020 - 21 (Under CBCS Pattern)

ENGLISH 203: FICTION – II

UNIT – I

Background Study

**Literary History – Genres – Movements – Ideas – Trends –
Concepts**

UNIT – 2

- 1. Virginia Woolf : Mrs. Dalloway**
- 2. James Joyce : The Portrait of the Artist as a Youngman**

UNIT – 3

- 3. D.H. Lawrence : Son and Lovers**
- 4. William Golding : Lord of the Flies**

UNIT – 4

- 5. Graham Greene : The Power and the Glory**
- 6. Thomas Hardy : Tess of the D'Urbervilles**



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DEPARTMENT OF ENGLISH

**SECOND SEMESTER
MA English**

2020-2021

With effect from 2020 - 21 (Under CBCS Pattern)

ENGLISH 204: Prose-II

UNIT – I

Background Study

Literary History – Genres – Movements – Ideas – Trends – Concepts

UNIT – 2

1. Bertrand Russell : Knowledge and wisdom

2. John Ruskin : Sesame and Lilies

UNIT – 3

3. Virginia Woolf : A Room of One's own

4. George Orwell : Politics and English Language

UNIT – 4

5. Winston Churchill : Blood, Toil, Tears and Sweat

6. G.K. Chesterton : The Fallacy of Success.



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DEPARTMENT OF ENGLISH

SECOND SEMESTER

MA English

2020-2021

With effect from 2020 - 21 (Under CBCS Pattern)

ENGLISH 205: ENGLISH LANGUAGE TEACHING

UNIT – 1

- 1. Language Acquisition and Language Learning**
- 2. Problems of Teaching / Learning English as a Second Language in the Indian Context**
- 3. Current Trends of Teaching English in India.**

UNIT – 2

Teaching of English Language – Theories, - Concepts- Methods – Direct, Grammar Translation – Bilingual – Audio lingual – Desuggestopedia.

UNIT – 3

Teaching poetry & Prose from Language Perspective
Teaching LSRW Skills

UNIT – 4

Materials and tools – Development of Sources for Teaching – News Papers- Advertisements – Magazines – Utility of Language lab for teaching English.

as a part of practical work.



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M.Sc. Zoology

2020-2021

**Revised Syllabus Effective from the Academic Year 2021-22
Based on New Education Policy (NEP) 2020 and
Choice based credit system (CBCS)**

Program Educational Objectives (PEOs)	
PEO1	The programme has been designed to have a mix of both classical and modern aspects of Zoology for better understanding of animal world.
PEO2	Make students understand the importance of biodiversity for sustainable development
PEO3	Appearing for NET, SET, GATE, ASRB and other competitive examinations of APPSC and UPSC
PEO4	To develop trained and knowledgeable human resources for academic research labs and industry
PEO5	To develop self-employability in animal produce related ventures like pearl, honey, silk, wax etc.,

Program Specific Outcomes (PSOs); The Students at the Completion of programme will have	
PSO1	Can understand and appreciate life environment interaction
PSO2	The ability to understand the intricacies of the subject at advanced level and hone up skills to opt for research programme
PSO3	Students can Venture into industry as various animals and their produce such as Coral, pearl, honey, wax, silk, lac, shell of turtles, bones, feather, tusk and fur have high demand now a days
PSO4	Equip them to disseminate the knowledge at different levels of education.
PSO5	As students have hands on training in biochemical and molecular biology techniques, helping them to get employment opportunities in R&D of pharmaceutical industry.
PSO6	Know the applications of biotechnology in various fields like agriculture, industry and human health.
PSO7	Understand the basic principle of computational biology to extract information from large databases and to construct computer modeling. Get employment in healthcare industry
	Understand the role of environmental conservation process in pollution control and biodiversity and protection of endangered species.

Program Outcomes (POs)	
PO1	At the end of the programme students should understand and appreciate the importance of animals for sustainable development.
PO2	The students also understand basic concepts of life sciences and their relevance in their day to day life.
PO3	Learn, how to exploit animals of economic importance for betterment of human life such as aquaculture, sericulture, vermiculture, poultry etc.
PO4	With gained skill set in molecular biology techniques, can have scope to start diagnostic labs, besides getting opportunities in pharma industries.



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M.Sc. Zoology

2020-2021

Semester- I

ZOO15101 : STRUCTURAL ANATOMY OF INVERTEBRATA & VERTEBRATA

Course outcome: It gives scope to learn, understand and appreciate diversity of anatomical features of invertebrates and vertebrates with respect to various physiological functions.

UNIT -I

- 1.1 Species concept, International code of Zoological nomenclature, Taxonomical procedures, New trends in taxonomy
- 1.2 Acoelomata, Pseudocoelomata, Coelomata, Protostomia and Dueterostomia
- 1.3 Patterns of feeding and digestion in Porifera and Coelenterata
- 1.4 Feeding in Polychaeta, Mollusca and Echinodermata

UNIT-II

- 2.1 Structure of Gill, Lungs and Trachea
- 2.2 Circulatory system in Annelids, Arthropods and Mollusca
- 2.3 Advanced nervous system- Annelida, Arthropoda and Mollusca
- 2.4 Larval forms of Crustacea and Echinodermata

UNIT-III

- 3.1 Vertebrate integument and its derivatives: skin structure and functions, glands, scales, horns, claws, nails, hoofs, feathers and hairs
- 3.2 Evolution of heart
- 3.3 Evolution of aortic arches
- 3.4 Comparative account of respiratory organs

UNIT-IV

- 4.1 Evolution of Urinogenital system in vertebrate series
- 4.2 Organs of Olfaction, taste and lateral line system
- 4.3 Comparative anatomy of the brain in relation to its functions
- 4.4 Spinal cord and cranial nerves in mammals

List of Practicals

1. Museum study of all phylum wise representatives (Protozoa to Echinodermata)
2. Museum study of all class wise representatives (Cyclostomes & Mammals)
3. Virtual dissection of crab nervous system
4. Virtual dissection of *Poiceloceros* digestive, reproductive and nervous system
5. Virtual dissection of cockroach reproductive and nervous system
6. Virtual dissection of weberian ossicle and brain in *Labeo rohita*
7. Virtual dissection of cranial- Nerves of *Labeo rohita*
8. Virtual dissection of cranial Nerves of frog/ toad
9. Virtual dissection of circulatory (arterial & venous) system in *Calotes*
10. Virtual dissection of Urinogenital system in *Calotes*.

SUGGESTED READING MATERIAL

1. Hyman, L.H. The Invertebrates. Vol.1. Protozoa through Ctenophora, Mc Graw HillCo., New York.
2. Barrington, E.J.W. Invertebrate structure and function. Thomas Nelson and Sons Ltd., London.
3. Jagerstein, G. Evolution of Metazoan life cycle, Academic Press, New York & London.



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M.Sc. Zoology

2020-2021

ZOO15102: GENETICS & EVOLUTION

Course outcome: Students will learn about Mendelian and non-Mendelian inheritance. Understand the concepts multiples alleles, genetic disorders and karyotyping etc. Students acquire knowledge regarding different evolutionary theories and speciation.

UNIT – I

- 1.1 Principles of Mendelian Inheritance- Identification of DNA as a genetic material, Gene as a unit of expression.
- 1.2 Interaction of genes: Multiple alleles, ABO groups & Rh factor, Epistasis; Incomplete dominance, codominance; Complementary genes, duplicate genes, lethal genes
- 1.3 Linkage, Recombination and gene mapping
- 1.4 Mutations: a) spontaneous and b) induced mutations; c) Molecular basis of mutations

UNIT – II

- 2.1 a) Numerical and Structural abnormalities of human chromosomes and syndromes
b) Human karyotype and human genome
- 2.2 Sex linked inheritance
- 2.3 Pedigree analysis
- 2.4 Eugenics: a) Positive eugenics, Artificial insemination, sperm banks
b) Negative eugenics, Amniocentesis, consanguinity, Genetic counseling

UNIT – III

- 3.1 Theories of organic evolution- Emphasis on Darwinism and Lamarckism
- 3.2 Neo-Darwinism
- 3.3 Role of isolating mechanisms
- 3.4 Models of speciation (Allopatric, sympatric and parapatric)

UNIT – IV

- 4.1 A detailed account on destabilizing forces (i) Natural selection (ii) Mutation (iii) Genetic drift
- 4.2 Phylogenetic gradualism & punctuated equilibrium
- 4.3 Micro & Macro evolution
- 4.4 Gene Evolution and Amino acid sequence and phylogeny

List of Practical:

1. Blood grouping
2. Rh factor demonstration
3. Mendelian ratios and its related Problems
4. Karyotyping
5. Syndrome charts – demonstration
6. Demonstration of Barr bodies
7. Problems on Hardy Weinberg's law

SUGGESTED READING MATERIAL

1. Genetics – Monrye W. Strickberger, 3rd Ed., May, 2000.
2. Genetics – K.B. Ahluwallia – 1985.
3. Principles of Genetics – E.J. Gardner, M.J. Simmons & D.P. Snustad
4. Molecular Biology of genes – Watson, J.D., N.H. Hopkins, J.W. Roberts, J.A. Steitz & A.M.
5. Weiner. The Benjamin Cummings publishing company. Inc. Tokyo.
6. Basic Human Genetics – E.J. Mange, Arthur P. Mange. Indian Print, 1997.
7. Genetic disorders of Man by M.R. Goodman.
8. An introduction to modern genetics by Ch. Waddington.
9. Dobzhansky, Th. Genetics and origin of species, Columbia University press.
10. Dobzhansky, Th., F.J. Ayala, G.L. Stebbins and J.M. Valentine
EVOLUTION: Surjeet publications, New Delhi latest edition.
11. P.A. Moody Introduction to Evolution II ed/latest: Kalyani publishers, New Delhi.
12. Hartl, D.L. A primer of population genetics, Sinauer Associates Inc.,
Massachusetts.
13. Peter Volpe E. Understanding Evolution, University Book stall, New Delhi.
14. An introduction to genetic analysis. Griffiths, A.J.F., J.H. Miller, D.T. Suzuki, R.C. Lewontin & W.M. Gelbark. W.H. Freeman and Company, New York.

ZOO15103: CELL BIOLOGY & MICROBIOLOGY

Course outcome: Students learn and gain knowledge on cellular structure and functional organization of prokaryotes and eukaryotes. It gives scope to understand types of cell divisions and appreciate the mechanisms underlying cell death and proliferation. Students would learn about modes of cell signaling besides understanding cell surface receptor and intracellular signal transduction pathways. Students gain knowledge on the basics of microbiology, microbial diseases, growth and their control. Gain knowledge on applications of microbes in industry and learn the methods of production of some industrially important products.

UNIT – I

- 1.1 Cell organelles- Ultrastructure and functions: Cell Membrane, ER and Golgi complex,
- 1.2 Cell organelles- Ultrastructure and functions: Nucleus, Mitochondria, Ribosomes and Lysosomes
- 1.3 Cell Division and Regulation- Mitosis, Meiosis, Cell Cycle and its regulation
- 1.4 Cell death and proliferation – Apoptosis: definition, morphological and biochemical differences between apoptosis and necrosis, mechanism (internal and external signals) and significance.

UNIT – II

- 2.1 Cell signaling: Models of cell-cell signaling (steroid receptors, nitric oxide and carbon monoxide)
- 2.2 Functions of cell surface receptors (G-protein coupled receptors, Tyrosine kinases, cytokine receptors, receptors linked to other enzymatic activities).
- 2.3 Pathways of intracellular signal transduction (cAMP pathways, cyclic cGMP, phospholipids and Ca²⁺, Ras, Raf and MAP kinases)
- 2.4 Brief account of biology of cancer.

UNIT-III

- 3.1 History and Scope of Microbiology
- 3.2 Microbial nutrition, growth and their control
- 3.3 Normal microbial flora of human body-skin, nose, respiratory tract, stomach, intestine, urinogenital tract.
- 3.4 Microbial diseases and their control
 - a) Bacterial diseases - Tuberculosis, Plague, Anthrax,
 - b) Viral diseases - AIDS, Rabies, Hepatitis
 - c) Fungal diseases - Cutaneous mycoses, Sub-cutaneous mycoses and Systemic mycoses,
 - d) Protozoan diseases - Amoebiasis and Malaria

UNIT-IV

- 4.1 Microbiology of fermented food (Diary Products, Meat and Fish, Microorganisms as sources of food)
- 4.2 Industrial Microbiology (Types of fermentation process, Alcoholic beverages)
- 4.3 Industrial productions - Lactic acid and Glutamate
- 4.4 Therapeutic compounds – Antibiotics (Penicillin), Steroids and Industrial enzymes(Amylase and Protease).

List of Practicals

1. Mitosis – Onion root tips
2. Meiosis in flower buds/
Grasshopper testis
3. Giant chromosome in
Chironomus Larva
4. Effect of colchicine on mitosis
5. Staining techniques—simple,
Gram's staining
6. Isolation of microorganisms
7. Wet mount preparations
8. Antibiotic sensitivity tests

SUGGESTED READING MATERIAL

1. Cell Biology (Fundamentals and Applications) By Gupta / Jangir, 2001; Agrobios, India.
2. Cell and Molecular Biology by EDR De Robertis and EMR De Robertis Jr,
IndianEdition, B.I. Publications, Pvt. Ltd.
3. The Cell (A Molecular Approach) by Geoffrey M. Cooper, 2nd Edn. 2000, ISBN.
4. Text Book of Microbiology, by R. Aananthnarayan & C.K. Jayaram Panikar, 4th
Edition, Orient Longmen, Hyderabad, 1990.
5. General Microbiology by C.B. Powar & H.F. Daginawala 1st Edition, Himalaya
PublishingHouse, Bombay, 1982.
6. Elements of Microbiology, by M.J. Pelzar, Jr & E.C.S Chan International students
Edition, 1981, MCGRAW-Hill international Book Company, New Delhi.
7. Microbiology C.M. Presscots, J.P. Harley & D.A Klein Mc Graw Hill. WCB

ZOO15104A : TOOLS AND TECHNIQUES IN BIOLOGY (Internal Elective)

Course outcome: Students gain knowledge about various tools and techniques used in biological systems and gives them insights about their usage in research and various diagnostics. Students will gain knowledge on animal cell culture techniques.

UNIT-I

- 1.1 Microscopy: Types of microscopes – Phase contrast microscope, Fluorescence microscope; Electron microscope – TEM and SEM
- 1.2 Centrifugation – basic principles, Types of rotors, high speed and ultracentrifuge
- 1.3 Principles of spectroscopy, Laws of Light absorption, applications of Colorimetry, Spectrophotometry
- 1.4 Measurement of pH and biological Buffers

UNIT-II

- 2.1 Chromatography – paper chromatography – thin layer chromatography
- 2.2 Ion exchange chromatography and affinity chromatography
- 2.3 Introduction to FPLC and HPLC
- 2.4 Radio isotope techniques – types of radio isotopes, detection and measurement of radioactivity. Applications of radio isotopes in biological sciences and safety measures

UNIT-III

- 3.1 Microtomy and staining procedures– types of microtomes, types of stains, staining procedures of biological materials
- 3.2 Electrophoresis: SDS-PAGE, Agarose gel electrophoresis
- 3.3 Blotting techniques
- 3.4 ELISA

UNIT-IV

- 4.1 Design and functioning of tissue culture laboratory methodology
- 4.2 Culture media preparation
- 4.3 Cell proliferation measurements
- 4.4 Cell viability testing and cell harvesting methods

List of Practicals

1. Separation of biological compounds by paper chromatography
2. Preparation of Buffers and measurement of pH
3. Separation of biological compounds by TLC
4. Absorption spectra of proteins and nucleotides
5. Separation of mitochondria and differential centrifugation
6. Separation of biomolecules using HPLC
7. Preparation of cell culture media
8. Separation of proteins by SDS-PAGE

SUGGESTED READING MATERIAL (ALL LATEST EDITIONS)

1. Animal Cell Culture – A practical approach, Ed John. R.W Masters. IRL Press.
2. Introduction To Instrumental analysis, Ronert Braun. McGraw Hill International
3. A Biologists Guide to Principles and Techniques of Practical Biochemistry, K. Wilson & K.W. Goulding, ELBS Edn.
4. Advanced Micripipette Techniques for cell physiology. K.T. Brown and D.G. Flamming IBRO. Hand Book Series. A Wiley Interscience publications, John

ZOO15104B: BIOLOGY OF PARASITISM (Internal Elective)

Course Outcome:

Students will learn about the mode of entry, mode of infection and life-cycle of different metazoan parasites such as protozoans, digeneans, cestodes and nematodes in plants and animals. Students will learn about the zoonotic parasites and their impact on human beings.

UNIT-I:

- 1.1. Introduction to parasitology; animal associations and host – parasite relationship
- 1.2. Distribution of diseases and Zoonosis caused by animal parasites
- 1.3. Morphology, life- cycle, mode of infection of *Plasmodium*, molecular biology of *Plasmodium* – drug targets, mechanism of drug resistance, vaccine strategies and proteomic approaches
- 1.4. Morphology, life-cycle, mode of infection of *Leishmania*, molecular biology of *Leishmania* – drug targets, drug resistance and vaccine strategies.

UNIT-II:

- 2.1. Morphology, biology, life-cycle and mode of infection of *Entamoeba* and *Giardia*
- 2.2. Morphology, biology, life-cycle and Mode of infection of *Taenia*, *Diphyllobothrium*, *Diphylidium*
- 2.3. Morphology, biology, life-cycle and Mode of infection of *Schistosoma*, *Fasciola*, *Paragonimus*, *Opisthorchis*.
- 2.4. Gastro-intestinal nematodes, their morphology, biology and life-cycles.

UNIT-III:

- 3.1. Modes of entry of *Schistosoma* and *Wuchereria*
- 3.2. Modes of entry of *Brugia* and *Ancylostoma*
- 3.3. Modes of entry of *Trichinella* and *Dracunculus*
- 3.4. Molecular biology of nematodes, vaccine strategies.

UNIT-IV:

- 4.1. Immune response and self-defense mechanisms, immune evasion and biochemical adaptations of parasites
- 4.2. Parasites of veterinary importance
- 4.3. Parasites of insects and their significance
- 4.4. Nematode parasites of plants, morphology, biology, life-cycle and infection of crop plants by plant parasitic nematodes.

Suggested Literature:

1. Foundations of Parasitology, Roberts L.S. and Janovy J., McGraw-Hill Publishers, New York, USA.
2. Modern Parasitology: A Textbook of Parasitology, FEG Cox., Wiley-Blackwell, U. K.

Practicals

1. Study of prepared slides and museum specimens of selected parasites of representative groups of protozoans, helminths and arthropods.
2. Demonstration of *in vitro* culture of *Plasmodium*, infection of mice with *Plasmodium*, chasing the process of infection by histopathology and immunereactions.
3. Culturing insect parasitic nematode, and chasing the life-cycle of the nematode on the insect host.
4. Culturing an insect parasitoid and studying their infection on an insect host.
5. Studying the infection of tomato plant by root knot nematode.

ZOO15104C: Principles of Ecology (Internal Elective)

Outcome:

Students acquire knowledge on different ecological concepts: characteristics of several Ecosystems. Students will gain adequate knowledge on food chain system, Biochemical cycles, food web, energy flow etc.. Students learn latest topics on bio Indicators, Bio and phytoremediation. This paper gives complete knowledge on all aspects of Ecology.

Unit I:

Introduction to ecology, evolutionary ecology, environmental concepts –laws and limiting factors, Ecological models. Characteristics of population, population size and exponential growth, limits of population growth, population dynamics, life history pattern, fertility rate and age structure. Competition and coexistence, intra-specific and inter-specific interactions, scramble and contest competition model, and commensalism, prey-predator interactions.

Unit II:

Nature of ecosystem, production, food webs, energy flow through ecosystem, biogeochemical cycles, of ecosystem, ecosystem management. The biosphere, biomes and impact of climate on organisms. Stresses and their management, global climatic pattern, global warming, ozone, acid and nitrogen deposition, coping with limatic variations. Major classes of contaminants. Uptake, biotransformation, detoxification, and accumulation of toxicants.

Unit III:

Factors influencing bioaccumulation from food and trophic transfer. Pesticides and other chemical in agriculture, industry and hygiene and their disposal. Impact of chemicals on biodiversity of microbes, animals and plants. Bioindicator and biomarkers of environmental health. Biodegradation and bioremediation of chemicals.

Unit IV:

Biodiversity – assessment, conservation and management, biodiversity act and related international conventions. Sustainable development, natural resource management in changing environment. Molecular ecology, genetic analysis of single and multiple population, phylogeography, molecular approach to behavioural ecology, conservation genetics.

Suggested Literature:

1. Field Sampling: Principles and Practices in Environmental Analysis, Conklin, A.R.Jr., (2004), CRC Press.
2. Principles and Standards for Measuring Primary Production, Fahey, T.J. and Knapp, A.K., (2007), Oxford University Press, UK
3. Ecological Modeling, Grant, W.E. and Swannack, T.M., (2008), Blackwell.
4. Fundamental Processes in Ecology: An Earth system Approach, Wilkinson, D.M., (2007), Oxford University Press, UK

List of Practical:

Habitat studies:

1. Physical and chemical characteristics of soil.
2. Assessing influence of light, temperature and moisture on plant germination and growth/animal behavior and growth.
3. Assessing influence of soil nutrient status on plant germination and growth.

Community/ecosystem studies:

1. Assessment of density, frequency and abundance of plants/animal in a community using various techniques i.e. transect, quadrat etc.
2. Comparison of stands/communities and ordination.
3. Profile diagrams.
4. Biomass and reproductive allocation under various environments.
5. Nutrient uptake and budget for various communities/Food chain assessment.
6. Decomposition of various organic matters and nutrient release mechanisms/role of arthropods and other micro-, and macrofauna in decomposition.
7. Understanding ecosystem succession by studying various stages of vegetation/community assemblages development.
8. Molecular techniques in laboratory.
9. Insect diversity in soil.

Landscape studies:

1. Principles of GIS, GPS and RS technology.
2. Interpretation (visual and automated) of remote sensing information for landscape differentiation

ZOO15105 –Practical 1 (15101 and 15102)

ZOO15106 –Practical 2 (15103 and 15104A or B or C)

