Dr. BRR GOVERNMENT COLLEGE

(Accredited with B^{++} by NAAC)

JADCHERLA-509301

MAHABUBNAGAR (DIST), T.S

Dr. CH AppiyaChinnamma M.Sc., Ph.D.
Principal

PROGRAMME OUTCOMES

At the end of under graduate programme, students will be able to do the following outcomes.

PO1. **Strengthening of knowledge**:

Knowledge of domain subjects will be gained by students and be able to apply it wherever necessary in favorable manner.

PO2. Modern tool usage

Create, select and apply appropriate techniques and modern tools including prediction and modeling to complex activities with an understanding of the limitations.

PO3. Ethics and computing skills:

Students learn critical thinking and able to analyses and solve problems rationally and ethically for communication and express legal and ethical issues and understand the moral dimensions of decisions and responsibilities.

PO4. Conduct investigations of complex problems:

Identify, formulate, review research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.

PO5. Individuals and Team work:

Function effectively as an individual and a member of leader in diverse teams and in multidisciplinary settings,

PO6. Effective communication:

Communicate clearly and concisely using the professional standards of their fields.

PO7. **Environment and sustainability**:

Understand the impact of the environmental contents and demonstrate the knowledge for sustainable development.

PO8. **Student andSociety**:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety legal and cultural issues and the consequent responsibilities relevant at regional, national and global levels.

PO9. Project management and finance

Goals, objectives and components of a project identified and then implementation, so that goals are achieved, even when these are drawbacks.

2.6.1 - Teachers and students are aware of the stated Program and course outcomes of the Programs offered by the institution.

The learning outcomes and courses are clearly mentioned and communicated to the Students and Staff members. Each department has a subject wise syllabus and its learning outcomes. The information related to program outcomes and programme specific outcomes and course outcomes are discussed during staff meetings.

This institution is running courses such as: Undergraduate (B.A, B.Sc, B. Com) Self finance (Computer Science/ Microbiology/ Computer Applications) in C.B.C.S for the students.

This Initiation offers 17 subjects in CBCS viz. English, Hindi, Telugu, Sanskrit Commerce, Political Science, Economics, History, Public Administration, Chemistry, Physics, Botany, Zoology, Mathematics, Computer Science , Microbiology and Computer Applications.

Department of English

Program outcomes: English is the most important language to be taught during graduation. The course would teach the students most essential areas of English such as

1. Reading
2. Writing
3. Speaking and listening
4. Building confidence to use English at work or future studies
5. Building vocabulary and creativity

Program specific outcomes: English as a second language for graduate students seeks to develop the student's abilities in grammar, oral skills reading writing and study skills.

- Students will improve their speaking ability in English both in terms of fluency and comprehensibility.
- Students will give oral presentations and receive feedback on their performance.
- Students will increase their reading speed and comprehension of academic articles.

Course Outcomes:

Class: I year U.G Semester-I on completion of this courses students would understand from prose:-

1. The humor in “THE CRUSH IN THE SKY”
2. Who are the happy in “HAPPY PEOPLE”
3. Life is something more than an idle dream in “A PSALM OF LIFE”
4. How much materialism effects the modern man’s life that even respectful relationships has become trained in “DEAR PEPAR

Grammar

Students would learn

- Vocabulary
- Parts of speech
- Conversation
- Punctuation
- Writing
- Reading passage
- Spelling

Improves language which is very essential for better speech or writings

Personality development

Soft skills like:

- Motivation and goal setting
- Self confidence
- Non- verbal communication and body language
- Interpersonal skills

By learning above the students would build overall development in their lives for their career and also higher studies.

I year U.G. semester- II

On completion of this course students would learn and understand:-

1. The specifying of old age people with their loneliness in "A VISIT OF CHARITY"
2. How, people would waste their time in religious superstition in "BEAREA "
3. Suffering and depression due to different reasons of P.B. Shelly in the poem "STANAZA WRITTEN IN DEJECTION"

Grammar

Vocabulary – figures of speech

Affricate and Nasal

Articles

Writing – Formal letters

Palindromes

Personality development:

1. Time Management
2. Leadership
3. Stress Management
4. Etiquette and Grooming

Value orientation

Time and Tide wait for none, The pen is mightier than the sword, Practice makes man perfect. Necessity is the mother of invention

Semester III:

After completion of semester III the students would learn and understand the following though poems:-

1. Despite in temporary and hopes would win eventually in "LIFE POEM"
2. Life experience during childhood days of a poet in punishment in kindergarten.

And the students would learn and understand the following from prose:-

1. Importance of "ART FOR ART'S SAKE" and all work and no play makes Jack a dull boy in "A WRONG MAN IN WORKERS
2. PARADISE".
3. How the language is roasted by Americans and Indians.

GRAMMAR

Vocabulary, antonyms, synonyms, usage British and American English difference active voice and passive voice idioms connectives essay writings.

All the above would help students to improve language skills

Semester –IV

After completion of semester IV the students would learn and understand the following through poems:-

The people's reaction towards new things but when they are appointed widely they would become a common one in the poem "FLOWER".

The impossible relationship between human beings and nature conveys the need for protecting the environment "ECOLOGY" poem.

And the students would learn and understand the following through prose:-

1. Nature and human life is depleted while survival symbols trees, birds stringed land kited in the kite makes.
2. The challenges that the language is likely to face in near future in what's the future of the languages.

Grammar:

Vocabulary

Determiners

Review writing

Conditionals

DEPARTMENT OF TELUGU

TELUGU SUBJECT FOR ALL U.G. COURSES (POs, PSOs& COs)

I. Program Outcomes

Students seeking admission for B.A/B.COM./B.Sc./B.B.A, any program with a second language as TELUGU is expected to motivate with following qualities which helps them in their future life to achieve the expected Goals.

a. Communication Skills

b. To know the history of Telugu language and literature

c. Creative ability.

d. Responsible and dutiful citizen

II. Program Specific Outcomes.

On completion of U.G.Course with second Language as a Telugu, Students are able to:

1. understand the basic concept and subject of Telugu & its origin

2. make or not the importance of subject Telugu & its Branches.

3. understand various aspects of Telugu literature with a process to reach a method and give new mode and direction.

4. make an attempt in different areas and theory such as vocabulary and vice versa

5. understand Literature in a broader way as they may be confined to subjects.

6. know about Telugu literature its roots cause perspectives and methods.

7. Elaborating and understanding its philosophical methods of Telugu Literature.

8. Evaluating the concept of Telugu from past to present and making the society more closely through literature.

III. Course outcomes

PROGRAMME OUTCOMES

Three Text books: **Sahithi Manjeera**, for the first and second semester and **Sahithi Kinnera** for the third and fourth semester and **Saahithi Dundhubhi** have been prescribed both these text books.

OBJECTIVES: students can enhance the knowledge of Telugu Language and Literature from the lessons and also make their personality in a meaningful way.

After the successful completion of two years, students will be able to comprehend .

1. Filling up the gaps in the Language abilities lifted due to formal education.

2. Creating through grounding in all four language abilities Listening, Speaking, Reading, Writing

(L S R W).

3. Enabling the students to communicate information, Opinions, Ideas and Feelings.

4. Language Reading helps exercise the brain to keep it flexible and agile.

5. Language learning showed an increase in memory capacities that was especially strong in long ,and short memories .

Class: FIRST YEAR U.G. SEMESTER-I GADYA BHAGAM (Prose):

On completion of this course, students are able

1. To understand the importance of good character in life through "Kaasulu by Gurajada Apparao".

2. To understand the relationship between the market and human values through "Raaju-kavi by Gurram Jashuva".

3. To understand about the our country need to our participation to developing our country through Jayabheri by Sri Sri

4. To understand the Cultural unity and History of Ancient India through ." Gangireddu" by Dr.Palla Dhurgaiah"

PADHYA BHAGAM (POETRY):

On completion of this course, students are able

1. To understand about the true word power and about kavi Nannaya's Style of Writing through " "Shakunthalopaakhyanam"

2. To understand devotion between god and devotees through Godagoochi by Paalkooriki Somanayha

3. understanding the persistent personality through "Samvaranudi thapassu" by Addhanki Gangadgarudu.

UPAVAACHAKAM (RUDRAMADEVI NAVEL)

To understand and learn moral values and Kaakatheeya freedom and Rudramma fighting through this novel written by Oddhiraaju Seetharaama Chandra Sharma .

BHASHA BHAGAALU - VYAAKARANAM

On completion of this course, students are able to understand

1. Paryaaya padhalu
2. Naanardhaalu
3. Sandhulu
4. Samasalu
5. Telugu vaakyam
6. Better Language skills

Class: FIRST YEAR U.G. SEMESTER-II PADYA BHAGAM (Poetry):

On completion of this course, students are able

1. To understand how to pray God in hardships through "Gajendra Moksham by Bammera pothana"

2. To understand the role of soft skills through "Hanumath Sandesham" by Mollaa

3. To understand moral values through "Subhaasithaalu" by Yenugu Laxman kavi

VACHANA VIBHAGAM

1. To understand about how to write a kathanika (Short Story) and the reign of Nizams through "Yugantham" by Nelloori Keshava Swaamy
2. To understand the feelings of animals and to know the dialect of Palamuru District. through "Yenkanna" by Aachaarya Paakaala Yashoda Reddy
3. To understand the taste and types of mangoes through "Maamidi pandu" by Suravaram Pratapa Reddy

VYAKARANAM & CHANDHASSU

On completion of this course, students are able

To understand how to write a poem with appropriate words according to chandassu (Laghuvu,Guruvu).

Class: SECOND YEAR U.G. SEMESTER-III "PRAACHINA KAVITHVAM" (Poetry):

On completion of this course, students are able

1. To understand Human Values and better Society and speaking skills through " Dharmajuni Vaakchaathuryam" by Thikkana

2. To understand Honesty, High Values and truth through "Vibheeshana sharana gathi" by Gonabuddha Reddy.

3. To inculcate values in youth through "Gunanidhi" by Sreenathudu

AADHUNIKA KAVITHVAM (PROSE)

On completion of this course, students are able

1. To understand the life of a farmer through "Rithu prashasthi" by Vaanamaamalai Jagannathachaaryulu.

2. To understand the pious relation between student and teachers in Gurukula System through " Gurudhakshina" by Ambati Laxmi Narasimha Raju

3. To understand Progressive Literature through "Gudiselu kaalipothunnaai" by Boyi Bheemanna

VACHANA VIBHAGAM & ALANKAARAALU

On completion of this course, students are able to understand Rhyming words and Retoric language.

UPAVAACHAKAM

On completion of this area, students can understand the Socio-economic system of Indian villages through “Chali Cheemalu” by P.V. Ramana

Class: SECOND YEAR U.G. SEMESTER-IV PRAACHINA KAVITVAM (Poetry):

On completion of this course, students are able

1. To understand the qualities of an intelligent Student/Seeker through “Naarada Gaana Matsaryam” by Pingali Soorana”.

2. To understand ethics and values, stand on words through “Vaagdhaana Bhangam” by Aasoori Maringanti Venkata Narasimha Raju”.

3. To understand devotional values and the importance of cultural heritage through “Narasimha Shatakam” by Dharmapuri Sheshappa Kavi

AADHUNIKA VACHANA KAVITHVAM (Free Verse)

On completion of the course, students are able

1.To understand Human values and living in hormony through “ Naruda Nenu Naruda Nenu " by Kaaloji.

2. To understand Socio-economic conditions of a country “Aarthageetham” by Devarakonda Balagangadhara Tilak”.

3. To understand the Glorious history of Telangana Forts through “ Devarakonda Durgam” by Mukuraala Ramireddy.

Class: THIRD YEAR U.G. SEMESTER-V :

On completion of this course, students are able

1. To understand the importance of KAVITHA PRAKRIYALU (Poetic Forms)

- Padhyam
- Paata
- Vachana kavitha
- Laghu kavitha
- Urdhu kavitha

students learn to write various Poetic forms such as Poems,Songs,Free verse , short poems Ghajals,Rubai, and Nani.

TELUGU VYAASAM (ESSAY)

- Vyaasam
- Vyaasaparinaamam
- Vyaasa rachana paddhathulu
- Vyaasamlo vastu vaividhyam
- Vyaasa rachana bhasha prayogaalu

On completion of this course, students are able to write articles for journals ,magazines.

VACHANA SAAHITYAM (PROSE)

- Adhyayan samskruthi – "importance of study "
- Saahitya adhyayan prayojanaalu –" Benefits of studying literature"
- Mundhumaata- "knowing to write a foreword "
- Pustaka sameeksha – "how to review a book "
- Jaanapdham – "knowing folk literature "

Class: THIRD YEAR U.G. SEMESTER-VI :

On completion of this course, students are able

1. To understand the importance and various aspects of mass communication along with some Saahitya Prakriyalu and how to take up a PROJECT WORK .

- Naatakam
- Navala
- Kathaanika
- Jeevitha charitra
- Upanyaasa kala

On completion of this course, students are able to write a drama or novel or short story or autobiography. Excel in Art of Oratory

2. ELEMENTS IN JOURNALISM

- News
- Structure of news
- News Articles
- Interview
- Translation

On completion of this course, students are able to write various forms of literature to Media

3.INTRODUCTION OF PROJECT

- Project
- Adhyayanam
- Parikalpana
- Nivedhika

- To understand the importance and various aspects of research and to take up a PROJECT WORK .

Department of Hindi:

I. Program Outcomes

Students seeking admission for B.A/B.COM./B.Sc./B.B.A programmes with second language as **Hindi** are expected to motivate with following qualities which helps them in their future life to achieve the expected Goals.

a. Communication Skills

b. To know the history of Hindi language and literature

c. Creative ability.

d. Responsible and dutiful citizen.

II. Program Specific Outcomes.

On completion of U.G.Course with second Language as a Hindi, Students are able to:

1. To understand the basic concept and subject of Hindi & its origin
2. To make or not the importance of subject Hindi & its Branches.
3. To understand various aspects of Hindi literature with a process to reach a method and give a new mode and direction.
4. To make an attempt in different areas and theory such as vocabulary and vice versa
5. To understand Literature in a broader way as they may be confined to subjects.
6. To know about Hindi literature its roots cause perspectives and methods.
7. Elaborating and understanding its philosophical methods of Hindi Literature.
8. Evaluating the concept of Hindi from past to present and making the society more closely through literature.

III. Course outcomes

Class: FIRST YEAR U.G. SEMESTER-I GADHYA DARPAN (Prose):

On completion of this course, students are able

1. to understand the importance of good character in life through “Charitra “Sanghatan” by Babu “Gulabrai.
2. To understand the relationship between the market and human values through “Baajar Darshan” by Jainendra Kumar.
3. To understand about the life of a young widow and her feelings through“Bhabi” by Mahadevi Varma.
4. To understand the Cultural unity and History of Ancient India through “Bharat mein Sanskriti Sangam” by Ramdhari Singh Dinkar..
5. To understand Unity and Integrity of India through “ Rashtra Ka Swaroop " by Vaasudev Sharan Agrwal.

KATHA SINDHU (Short Stories):

On completion of this course, students are able

1. To understand Social Discriminations in Indian Society before Independence through the Short Story “Sadgati” by Premchand
2. To understand how a son of a freedom fighter tries to save his ill-health mother by performing some magic shows to get some money through “Chota Jadugar” by Jay

Shankar Prasad .

3. To understand how a person tries to protect the honesty through “Sachch ka Sauda” by Sudarshan.
4. To understand the satire on Superstitious beliefs in Society through “Prayaschit” by Bhagavati Charan Varma.
5. To understand the behavior of a middle class person towards the elders at home through “Chief ki Dawat” by Bheeshm Sahaani.

VYAKARAN (GRAMMAR)

On completion of this course, students are able to understand

1.“Ling’’ (Gender)

2. “ Vachan’’ (Number)
3. “Kaal’’(Tense)
4. “Karak’’(Case)
5. “Vaachya’’(Voice)
6. “Vakya Shuddh Kijiye.”
7. “Karyalayin Hindi”

for better language Skills.

Class: FIRST YEAR U.G. SEMESTER-IIGADHYA DARPAN (Prose):

On completion of this course, students are able

1. To understand the beauty of Kashmir Sceneries through “Dharati Ka Swarg by Vishnu Prabhakar”.
2. To understand relationships in Joint Family between elders and younger ones through “Tayee by Vishwambhar Nath Sharma Koushik”.
3. To understand Satire on Selfish Politics through “Raaj Neeti Ka Batvaara by HariShankar Parsai”.
4. To understand the life history of Swami Vivekananda through “Swami Vivekananda by Vamshidhar Vidyalankar”.
5. To understand environmental problems and solutions through “Paryavaran Aur Hum by Rajeev Garg”.

KATHA SINDHU (Short Stories):

On completion of this course, students are able

1. To understand the bravery of woman through “Gadal by Raangeya Raaghav”.
2. To understand about the Selfish people in the society through “Hasun ya Roun by Vinayak Rao Vidyalankar”.
3. To understand how a retired person is neglected by his own family through “Vaapasi by Usha Priyamvada”.
4. To understand how old aged persons are neglected by their own children through “Seva by Mamata Kaaliya”.
5. To understand how a suppressed caste girl determines and becomes a social worker through“Siliya by Susheela Takhbore”.

VYAKARAN (Grammar)

On completion of this course, students are able to understand 1.“Sandhi Vichched”

“ Vilom Shabd’’ (Antonyms)

“Patra Lekhan’’ (Letter Writing) for better language Skills.

Class: SECOND YEAR U.G. SEMESTER-III KAVYA

NIDHI (Poetry):

On completion of this course, students are able

1. To understand Human Values and better Society through “Kabir ke Dohe’’ by Kabir das.
2. To understand Honesty, High Values and truth through “Tulsi Ke Dohe’’ by Tulsi Das.
3. To understand the inculcation of optimism in youth through “Nava Yuva Kon Se’’ by Maithili Sharan Gupt.
4. To understand the Difficulties and Comforts of Human Life through “Phool aur Kaante’’ by Ayodhya Singh Upadhyay Hariaudh.
5. To understand the bravery of King Bharata in his childhood through “Bharat by Jaishankar Prasad”.
6. To understand how the poetess describes her childhood through “Mera Naya Bachpan’’ by Subadra Kumari Chauhan.

HINDI SAHITYA KA ITIHAAS (History of HindiLiterature)

On completion of this course, students are able

1. To understand the socio - cultural and political circumstances and features of “Adi Kaal”, the first era of Hindi Literature.
2. To understand the socio - cultural and political circumstances and features of “Bhakti Kaal”, the second era of Hindi Literature.
3. To understand a short biographies of following writers

1. Chandbardai
2. Tulsi Das
3. SoorDas
4. Bharatendu Harishchandra
5. Mythili Sharan Gupta
6. Sumitra Nandan Pant
7. Ramdari Singh Dinkar

VYAKARAN (Grammar)

On completion of this course, students are able to understand

1. Nibandh (Essay)
2. Anuvaad (Translation)

Class: SECOND YEAR U.G. SEMESTER-IV KAVYA

NIDHI (Poetry):

On completion of this course, students are able

1. To understand Human Values and better Society through “Rahim ke Dohe by Rahim”.
2. To understand Honesty, High Values and truth through “Bihari Ke Dohe by Bihari Lal”.
3. To understand the importance of Gautama Buddha in this present scenario through “Bhagavan Budhdha ke prati by Surya Kanth tripathi Nirala ".
4. To understand the mysticism, advaita veda and optimism through “Ve Muskate Phool Nahi’’ by Mahadevi Varma .
5. To understand the importance of Pen and Sword according to time through “Kalam Aur Talwar by Ramdhari Singh Dinkar”.
6. To understand how poets motivate us to move forward through“Tu kyun Bait gaya hai path Par’’ by Harivansh Rai Bachchan.

HINDI SAHITYA KA ITIHAAS (History of Hindi Literature)

On completion of the course, students are able

1. To understand the socio - cultural and political circumstances and features of “Riti Kaal (Shringar Kaal)”, the third era of Hindi Literature.
2. To understand the socio - cultural and political circumstances and features of “Adhunik Kaal”, the fourth era of Hindi Literature.
3. To understand a short biographies of following writers
    1. Meera Bai
    2. Bihari
    3. Raheem
    4. Mahaveer Prasad Dwivedi
    5. Suryakanth Tripathi Nirala
    6. Mahadevi Varma
    7. Harivamsha Rai Bachchan
    8. Agyeya
    9. Premchand

VYAKARAN (Grammar)

On completion of this course, students are able to understand 1.Nibandh (Essay)
2.BodhGaya Gadhyamsh (Comprehension)

Class: THIRD YEAR U.G. SEMESTER-V :

On completion of this course, students are able

1. To understand the importance and various aspects of hindi language like,
    - Official language
    - National language

- Lingua-Franca
- Functional hindi language

2. To understand the introduction of various forms of hindi literature like,
    - Poetry
    - Short story
    - Novel
    - Play
    - One act play
    - Essay
    - Auto-Biography
    - Memory
    - Sketch
3. To understand the theories of translation like
    - Origin of word
    - Definition of translation
    - Scope for translation
    - Importance of translation
    - Types of translation
    - Qualities of translator

.**Class: THIRD YEAR U.G. SEMESTER-VI:**

On completion of this course, students are able

1. To understand the importance and various aspects of mass communication like,
    - Origin of word
    - Definition of translation
    - Scope for translation
    - Importance of mass communication
    - Special features of mass communication
    - Types of mass communication
    - Audio, video, print

2. To understand the aspects of journalism like,
    - Origin of word
    - Definition of journalism
    - Scope for journalism

- History of journalism
- Importance of journalism
- Types of journalism
- Qualities of journalist
- India’s popular hindi dailies

3.To understand the various criticism of hindi literature

- Feminist criticism
- Dalit criticism
- Aadivasi criticism
- Minority criticism

DEPARTMENT OF COMMERCE

B.Com (Computer Applications)

PROGRAM OUTCOMES:

Students who have taken admission to this program of B.Com Computer Applications are expected to concentrate upon the following outcomes.

1. Commercial sense.
2. Develop managerial skills.
3. Entrepreneurial skill.
4. Budgeting policy.
5. Human Resources Management.
6. Develop Numerical ability.
7. Well versed with the Business Regulatory framework.

PROGRAMME SPECIFIC OUTCOMES

PSO – 1: Students will be able to acquire specific knowledge and skills relevant to their disciplines and careers. This program satisfies the educational entrance requirements for membership of relevant professional bodies.

PSO – 2: To acquire basic knowledge in information technology and its applications in the area of business, updated knowledge of computer application in trade, commerce, data security and safety.IOT, web technology, digital marketing and E- Commerce.

PSO – 3: To demonstrate an understanding of the Basics of Computer Applications in business and e- commerce, trade , Computerized Accounting, finance, economic and business law.

PSO- 4: To develop numerical abilities of students, to inculcate writing skills and business correspondence, e- mail and internet applications to create awareness of law and legislations related to commerce and business

PSO – 5: To introduce recent trends in business, organizations and industries, to acquire practical skills related to e- banking and other e- business.

PSO – 6: To inculcate various computer skills to Computers , Operating system , Word Processing, SpreadSheet, Powerpoint presentation ,

PSO – 7: To equip the students with knowledge of MIS.

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B.Com (Computer Applications)

COURSE OUTCOMES

Semester-I:

ENVIRONMENTAL SCIENCE:

1. Understanding environmental concerns by the students at the undergraduate level.

2. Understanding the relationship of man with the environment and helping them change his attitude for more positive, proactive, eco-friendly and sustainable lifestyles.

3. Getting information about climate change, Global warming, Acid rain, Greenhouse effect, Ozone, layer depletion.

4. Cultivating attitudes to safeguard the environment built particularly with field experience.

5. Realization of the impact of human actions on the immediate environment and the linkage with the larger issues.

6. Getting information about Environment Protection Acts.

ACCOUNTING-I

1. To record the basic journal entries.

2. Memorize how to calculate depreciation by applying various methods.

3. Maintain the financial statements of a business entity.

4. Rectify errors in accounts.

BUSINESS ORGANIZATION AND MANAGEMENT :

1. Apply conceptual learning skills in today's business environment.

2. Analyze financial performance of an organization.

3. Evaluate organizational decisions with consideration of the political, legal and ethical aspects of business.

4. Assess strengths, weaknesses, opportunities and threats of the business environment.

FUNDAMENTALS OF INFORMATION TECHNOLOGY:

1.To explore basic knowledge on computers from the practical .

Semester-II:

ACCOUNTING- II

1. To record the basic journal entries.
2. Memorize how to calculate depreciation by applying various methods.
3. Maintain the financial statements of a business entity.
4. Rectify errors in accounts.

BUSINESS LAWS :

1. Participation
2. Case Study Analysis
3. Individual or Group Projects
4. Presentations
5. Completion of assessment examinations

PROGRAMMING WITH C & C++ :

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

1. Appreciate and understand the working of a digital computer
2. Analyze a given problem and develop an algorithm to solve the problem
3. Improve upon a solution to a problem
4. Use the 'C' language constructs in the right way

Semester-III

PRINCIPLES OF INSURANCE:

1. provide a basic understanding of the Insurance Mechanism.

2. Identify the relationship between Insurers and their Customers and the importance of Insurance Contacts.

3. Give an overview of major Life Insurance and General Insurance Products.

PRACTICE OF LIFE INSURANCE:

1. Students learn an insight into the different types of Life insurance plans.
2. Enable the students to understand the importance of Nomination and Assignments
3. Students can learn an overview of policy Claims.

ADVANCED ACCOUNTING:

1. To acquire accounting knowledge of partnership firms and joint stock companies.

BUSINESS STATISTICS -I:

1. The ability to interpret statistical analysis tools commonly used in the workplace;
2. The ability to critically evaluate a standard business report including the graphics, probability statements and resultant commentary; and,

3. Use of Excel for basic data manipulation and simple statistical and graphical analysis.

RELATIONAL DATABASE MANAGEMENT SYSTEM:

On completing the subject, students will be able to:

1. Design and model of data in database.

2. Store, Retrieve data in database.

Semester:-IV

PRACTICE OF GENERAL INSURANCE:

1. To make the student understand general policies and accounting.

REGULATION OF INSURANCE BUSINESS:

1. Company Licensing
2. Producer Licensing
3. Product Regulation
4. Financial Regulation
5. Market Regulation
6. Consumer Services

INCOME TAX:

1. By the end of the course students will be able to describe how the provisions in the corporate tax laws can be used for tax planning.

2. Students of the course will be able to explain different types of incomes and their taxability and expenses and their deductibility.

3. Students who complete this course will be able to learn various direct and indirect taxes and their implications in practical situations.

4. Students of the course will be able to state the use of various deductions to reduce the taxable income.

BUSINESS STATISTICS-II:

1. The ability to interpret statistical analysis tools commonly used in the workplace.

2. The ability to critically evaluate a standard business report including the graphics, probability statements and resultant commentary .

3. Use of Excel for basic data manipulation and simple statistical and graphical analysis.

WEB TECHNOLOGIES:

1. To understand web architecture and web services.

2. To practice the latest web technologies and tools by conducting experiments.

3. To design interactive web pages using HTML and Style sheets.

Semester-V:

BUSINESS ECONOMICS:

1.Economics majors will be able to apply advanced microeconomic and macroeconomic theories to explain the behavior of individuals, businesses, and industries in market- based systems and the challenges of developing economies.

2.Economics majors will be able to explain the role of government in the economy, including taxing, spending, regulating and producing.

COST ACCOUNTING:

1.Explains cost accounting systems 2.Explains

the purposes of cost accounting

3. Defines the concepts of cost, expense, loss and revenue 4.Explains the

relationships between cost and financial accounting

5.Prepare production cost statement and cost of goods sold statement

COMPUTERIZED ACCOUNTING:

1.Upon successful completion of Computerized Accounting Applications, the student will be able to:
2.Demonstrate an understanding of accounting theory.
3.Apply accounting procedures using microcomputer software.
4.Communicate effectively using standard accounting terminology.
5.Demonstrate an understanding of accounting reports and records.

E-COMMERCE:

1.Gain a comprehensive understanding of the E-Commerce landscape, current and emerging business models, and the technology and infrastructure underpinnings of the business.

2. Leverage the E-Commerce platforms to enhance current business or incubate new businesses.

3. Gain an understanding on how innovative use of the E-Commerce can help developing competitive advantage

Semester: VI

COST CONTROL AND MANAGEMENT ACCOUNTING:

- Critically analyzes and provide recommendations to improve the operations of organizations through the application of management accounting techniques;

- Demonstrate the need for a balance between financial and non-financial information in decision making, control and performance evaluation applications of management accounting;

- Evaluate the costs and benefits of different conventional and contemporary costing

THEORY **AND PRACTICE OF GST:**

- Understanding the power and potential of Tally Accounting Software from the business perspective
- Recording Financial Transactions 3.Financial Reports Analysis
- Company Setup & Configurations 5.Charts of Accounts Setup

MULTIMEDIA SYSTEMS:

1. Students will understand multimedia in respect to many applications including business, schools, home, education, and virtual reality.
2. Students will understand the hardware and software needed to create projects using creativity and organization to create them.
3. Students will develop multimedia skills understanding the principal players of individual players in multimedia teams in developing projects.
4. Students will work with all aspects of images.
5. Students will work with all aspects of sound.
6. Students will work with all aspects of video.
7. Students will learn copyright laws associated with multimedia.
8. Students will learn the cost involved in multimedia planning, designing, and producing.
9. Students will learn ways to present their multimedia projects.

Department of Botany

After completion of B.Sc program with Botany a student can achieve under given program outcomes, program specific outcomes, and course outcomes.

Program Outcomes :

1. Students can have an outlook of the plant kingdom with morphological characters and life cycle of certain plants.
2. Students can know taxonomic characters of plants of certain families and he/she will be able to identify the plants with scientific names and some plants to the extent of family level.
3. Can have the knowledge of microorganisms and its importance in industry and daily life
4. understand the environment by studying interaction of biotic and abiotic factors and effect and causes of pollution and its controlling measures
5. Genetics provides knowledge about laws of inheritance, various genetic interactions, chromosomal aberration, multiple alleles. Structural and numerical changes in chromosomes. With the knowledge genetics one can understand the passing of characters of from parents to children
6. Understand different metabolisms in plants
7. Cell biology gives knowledge about cell organelles their functions
8. Molecular biology gives knowledge about chemical properties of nucleic acid and their role in living systems.
9. understand the organization of tissues in various plant organs and some wood structures
10. understand the development of plant embryo and formation fruit and seed the importance of plants in the treatment human diseases
11. They know nutritional importance of various plant products and artificial methods of plant propagation
12. Use modern Botanical techniques and recent equipment
13. Inculcate the scientific temperament in the students and outside the scientific community.
14. By doing project work in third year student shall be initiated towards research

Program Specific Outcomes :

1. A student can have botanical knowledge which shall be useful in farming, horticulture, mushroom culture, greenhouse technology, seed technology and also nutrition values of plants which shall be useful in daily life.
2. Students acquire fundamental Botanical knowledge through theory and practicals.
3. Acquire the knowledge of the basis of plants of life, reproduction and their survival in nature.
4. understand the role of living and fossil plants in our life.
5. Understand good laboratory practices and safety.

6. create awareness about cultivation, conservation and sustainable utilization of biodiversity.
7. know advanced techniques in plant sciences like tissue culture,greenhouse, seed technology ,Phytoremediation, plant disease management, formulation of new herbal drugs etc.
8. Students are able to start nursery, mushroom cultivation, bio fertilizer production, fruit preservation and horticultural practices.

Course Outcomes of B.Sc, Botany

Semester-I

Paper-I: Microbial Diversity and Lower Plants (BS 104)

- Develop understanding on the concept of microbial nutrition.
- Classify viruses based on their characteristics and structures.
- Develop critical understanding of plant diseases and their remediation.
- Examine the general characteristics of bacteria and their cell reproduction/
- Recombination.
- Increase the awareness and appreciation of human friendly viruses, bacteria, alga and their economic importance.
- Conduct experiments using skills appropriate to subdivisions.
- Understand the diversity among Algae.
- Know the systematics, morphology and structure of Algae.
- Understand the life cycle pattern of Algae.
- Understand the useful and harmful activities of Algae.
- Identify true fungi and demonstrate the principles and application of plant pathology in the control of plant disease.
- Demonstrate skills in laboratory, field and glasshouse work related to mycology and plant pathology.
- Develop an understanding of microbes, fungi and lichens and appreciate their adaptive strategies. • Identify the common plant diseases according to geographical locations and device control measures.
- Demonstrate an understanding of archegoniate, Bryophytes and Pteridophytes
- Develop critical understanding on morphology, anatomy and reproduction of Bryophytes and Pteridophytes.
- Understanding of plant evolution.
- Demonstrate proficiency in the experimental techniques and methods of appropriate analysis of Bryophytes and Pteridophytes.

Semester II

Paper II:

Gymnosperms, Taxonomy of Angiosperms and Ecology (BS 204)

- Demonstrate an understanding of Gymnosperms.
- Develop critical understanding on morphology, anatomy and reproduction of Gymnosperms
- Understanding of plant evolution and their transition to land habitat. proficiency in the experimental techniques and methods of appropriate analysis of Gymnosperms. • Classify Plant systematics and recognize the importance of herbarium and Virtual herbarium. Evaluate the Important herbaria and botanical gardens.
- Interpret the rules of ICN in botanical nomenclature. terms and concepts related to Phylogenetic Systematics.
- Generalize the characters of the families according to Bentham Hooker's system of classification and study the economic importance of plants belonging to certain families.
- Understand core concepts of biotic and abiotic components of Ecosystem.
- Evaluate energy sources of the ecological system.
- Assess the adaptation of plants in relation to light, temperature, water, wind and fire.
- Understand plant communities and ecological adaptations in plants.
- Conduct experiments using skills appropriate to subdivisions

Semester III

Skill Enhancement Course 1: Nursery and Gardening (BS 301)

- Understand the process of sowing seeds in nursery
- List the various resources required for the development of nursery
- Distinguish among the different forms of sowing and growing plants
- Analyze the process of Vegetative propagation
- Appreciate the diversity of plants and selection of gardening
- Examine the cultivation of different vegetables and growth of plants in nursery and gardening. Identify and practice safe use of tools, equipment and supplies used in nursery and garden management careers.

Skill Enhancement Course 2: Biofertilizers and Organic Farming

- Develop their understanding on the concept of bio-fertilizer
- Identify the different forms of biofertilizers and their uses
- Compose the Green manuring and organic fertilizers

- Develop the integrated management for better crop production by using both nitrogenous and phosphate bio fertilizers and vesicular arbuscular mycorrhizal (VAM).
- Interpret and explain the components, patterns, and processes of bacteria for growth in crop production

Paper III: Plant Anatomy and Embryology (BS 304)

Course outcomes :

- Understand the scope importance of Anatomy.
- Know various tissue systems.
- Understand the normal and anomalous secondary growth in plants and their causes.
- Perform the techniques in anatomy.
- With respect to recent knowledge students should know about the different tools in the taxonomy so as to relocate the phylogenetic position of plants or taxa. • Understands the structure of anther and pollen; Structure and types of ovules; Types of embryo sacs, organization and ultrastructure of mature embryo sac.
- Understands the Pollination mechanisms and adaptations; Double fertilization; Seedstructure appendages and dispersal mechanisms.
- Develops critical understanding about endosperm types, structure and functions;
- Develops critical understanding about dicot and monocot embryos; Embryo- endosperm relationship Definition, types and Practical applications of apomixis and polyembryony.

Semester IV

Skill Enhancement Course 3: Greenhouse Technology. (BS 401)

- Understand the basic concepts of greenhouse technology. knowledge on fertilizer application and irrigation systems in greenhouses.
- Get to know about pest management for greenhouse plants.

Skill Enhancement Course 4: Mushroom Culture Technology (BS 402)

- Recall various types and categories of mushrooms. • Demonstrate various types of mushroom cultivation technologies. various types of food technologies associated with the mushroom industry.
- Value the economic factors associated with mushroom cultivation
- Device new methods and strategies to contribute to mushroom production.

Paper IV: Cell Biology, Genetics and Plant Physiology (BS 404)

- The eukaryotic cell cycle and mitotic and meiotic cell division.
- Structure and organization of cell membrane.
- Process of membrane transport and membrane models.

- Mendelian and Neo-mendelian genetics.
- Studies the phenomenon of dominance, laws of segregation, independent assortment of genes.
- Understand the different types of genetic interaction, incomplete dominance. codominance, interallelic genetic interactions, multiple alleles and quantitative inheritance etc.
- Know the importance and scope of plant physiology.
- Understand the plants and plant cells in relation to water.
- Learn about the movement of sap and absorption of water in the plant body.
- Learn structure and general features of enzymes.
- Understand the concept of enzyme activity and enzyme inhibition.
- Understand the process of photosynthesis in higher plants with particular emphasis on light and dark reactions, C3 and C4 pathways.
- Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic
- respiration, Glycolysis, Krebs Cycle and Electron Transport System.
- Understand the Nitrogen Metabolism in higher plants with particular emphasis on Biological Nitrogen Fixation, Amino Acid and Protein Synthesis.
- Understands the function and role of Growth Regulators and Inhibitors.
- Understand the plant movements.

Semester V

Generic Elective Course 1: Industrial Microbiology (BS 501)

- Understand concepts of industrial microbiology
- Apply the usage of microorganisms in industry
- Measure the growth of microorganisms
- Analyze the use of microbes in industries such as dairy and medicines
- Explain the concept of fermentation
- Understand the use of patent with respect to industrial microbiology

Paper V: (BS 502)

Biodiversity conservation (DSE - 1A)

- Understand the morphological diversity of Bryophytes and Pteridophytes and Gymnosperms. • Understand the economic importance of the Bryophytes and Pteridophytes and Gymnosperms.
- Know the evolution of Bryophytes and Pteridophytes and Gymnosperms.
- Understand the habit of the angiosperm plant body.
- Know the vegetative characteristics of the plant.

- Learn about the reproductive characteristics of the plant.
- Understand the plant morphology and basic taxonomy.

Economic Botany (DSE – 1B)

- Understand core concepts of Economic Botany and relate with the environment, populations, communities, and ecosystems.
- Develop critical understanding on the evolution of the concept of organization of apex new crops/varieties, importance of germplasm diversity, issues related to access and ownership.
- Develop a basic knowledge of taxonomic diversity and important families of useful plants.
- Increase the awareness and appreciation of plant products encountered in everyday life.
- Appreciate the diversity of plants and the plant products in human use.

Seed Technology (DSE-1C)

- Understand the theoretical orientation of seed development.
- Analyze the different ways of seed processing in different plants.
- Examine the various methods of Seed testing.
- Understand the method of seed production in different plants.
- Explain the concept of hybrid seed production.

Semester VI, Paper VI:

DSE – 3: Project (BS 601)

DSE - 2A: Plant Molecular Biology (BS 602)

- Analyze the structures and chemical properties of DNA and RNA through various historic experiments.
- Differentiate the main types of prokaryotes through their grouping abilities and their characteristics.
- Evaluate the experiments establishing central dogma and genetic code.
- Gain an understanding of various steps in transcription, protein synthesis and protein modification.

DSE – 2B: Tissue Culture and Biotechnology (BS 602)

- Understands the in-vitro methods in plant tissue culture.
- Learn the aseptic techniques, the media used and the use of growth regulators.
- Understand the technique of micropropagation.
- Learn the in-vitro method of production of secondary metabolites.
- Study about ovary, ovule, anther, embryo and endosperm cultures and their applications.
- Learn organogenesis and somatic embryogenesis.

- Study soma clonal variations and their significance.
- Learn about protoplast culture, its isolation, regeneration.
- Learn viability tests of protoplasts.
- Understand somatic hybridization and cybridization.
- Learn about transgenic plants.
- Understand agrobacterium mediated gene transfer in plants.
- Learn the applications of transgenic plants.
- Study the role of plant tissue culture in agriculture, horticulture and forestry.
- Study different types of DNA
- Study different types of RNA DNA replication
- Study the different enzymes used in replication
- Understand the mechanism of replication DNA repair
- Study about genetic code, properties of genetic code, Transcription in prokaryotes and eukaryotes
- Learn the mechanism of transcription in prokaryotes and eukaryotes
- Understand the concept of promoters, transcription factors.
- Learn post transcriptional modifications in eukaryotes Translation
- Understand the mechanism of translation in prokaryotes and eukaryotes • Learn about translational enzymes and factors Regulation of gene expression
- Learn Operon Concept.
- Study lac operons.

DSE – 2C: Analytical Techniques in Plant Sciences (BS 602)

- Develop conceptual understanding of cell wall degradation enzymes and cell fractionation.
- Classify different types of chromatography techniques.
- Explain the principles of Light microscopy, compound microscopy, Fluorescence microscopy and confocal microscopy.
- Apply suitable strategies in data collections and disseminating research findings.

Department of Zoology:

Program Outcomes, Program Specific Outcomes and Course Outcomes of B.Sc. in Zoology

B. Sc. (Zoology) Program

B.Sc. in Zoology is an undergraduate Program in Zoology. Zoology is the branch of science which deals with the study of animal kingdom including the evolution, structure, Physiology, classification, embryology, habits, habitat and distribution of all the animals. The B.Sc. Zoology course is premeditated to introduce students to the study of zoology at the organism and organ function levels. The theoretical part of the program deals with the general principles of classical as well as modern zoology. The program provides the student with an introduction to the recent advances in zoology in the areas of systematic evolution, reproduction, development, animal diversity, biochemistry, cytology and animal ecology. This course is offered for candidates who are interested in the study of animals. The minimum time required to complete the course is three years.

Objectives:

Imparting quality education in Zoology has been the focus of the department right from its inception. Emphasis is given on education both within and outside the classroom.

The Department is dedicated to fulfill the following objectives through the curricular and co-curricular activities:

- To provide students with knowledge of fundamental principles in zoology that will provide a foundation for their later advanced course in more specific biological subjects.
- To make students familiar with animal classification schemes and other applied courses as well as developing an understanding of and ability to apply basic biological principles.
- To integrate the laboratory and lecture sections of the course and directed toward teaching students both in the classroom and on the field.
- To provide quality education offering skill based programs and motivate the students for self-employment in applied branches of Zoology.
- To inculcate the value based education and entrepreneurial skills among the students.
- To create awareness on environmental issues through various activities.

Programme Outcomes:

- ✓ To understand the nature and basic concepts of Animal Science.
- ✓ To be able to classify the animals on the basis of their evolutionary relationship with other animals, microbes and environment.
- ✓ It provides knowledge about life processes
- ✓ Students Learn and practice various experimental Skills in museums and laboratories.
- ✓ Students will be able to differentiate animal life with human life.

After successfully completing B. Sc. (Zoology) Programme students will be able to:

PO1. Communicate scientific information through effective formal and informal methods generally used in sciences.

PO2. Conduct basic scientific research and provide inputs for societal benefits.

PO3. Develop competence in basic sciences and in the content of the specific courses that constitute the principal knowledge of their degree.

PO4. Compare and contrast the characteristics of animals that differentiate them from other forms of life.

PO5. Acquire the skills in handling scientific instruments, planning and performing in laboratory experiments.

PO6. Understand and be aware of relevant theories, paradigms, concepts and principles of zoology.

PO7: Understand the structure and functions of cell types

PO8: Acquire time management and self-management skills.

PO9: Relate the various abiotic factors with health of living forms and ecosystems.

PO10: Explain the role of various biomolecules in living systems

PO11: Apply the knowledge of Zoology to understand the complexity of life Processes and phenomena.

PO12: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning.

Program Specific Outcomes:

- ✓ Students gain knowledge in anatomy and physiology of Invertebrates and Vertebrates.
- ✓ They are able to understand the importance of connecting links in the course of evaluation.
- ✓ After completion of this course they can judge different behavioral patterns of animals.
- ✓ They gain Knowledge in using the techniques such as r-DNA technology, ELISA, ART, IVF, AI etc.,
- ✓ They are better able to understand Immunological and Stem Cell Research Techniques.
- ✓ They gain knowledge in Cytology, Evolution and Genetics.

PSO1. Ability to connect and apply biological knowledge to other disciplines and to integrate

PSO2. Explain the origin of life with context to the origin of eukaryotic cell and endosymbiotic theory of origin., fossil records, Darwinism and Neo-Darwinism, experimental evidence.

PSO3. Illustrate zoological science for its application in branches like medical entomology, apiculture, aquaculture and agriculture etc

PSO4. Understand animal interactions with the environment and identify the major groups of organisms with an emphasis on animals and classify them within a phylogenetic framework.

Course Outcomes:

B. Sc. (Zoology) First Year

Sem & Paper	Course Outcomes (COs)
Course: Sem I Paper 1 **Animal Diversity – Invertebrates**	After successfully completing this course, students will be able to: □ Understand General characters and classification of Invertebrates From Protozoa to Echinodermata upto order levels with examples □ Explain and describe the Type study –Elphidium, Sycon Obelia, Schistosoma ,Dracunculus, Hirudinaria granulosa, Prawn, Pila □ Understand Locomotion and Reproduction in Protozoa. □ Explain and describe the Epidemiology of Protozoan diseases - Amoebiasis; Giardiasis; Leishmaniasis and Malaria. □ Gain knowledge on General characters and classification of Porifera up to order levels with examples □ Understand the concept of Canal system in sponges and Spicules. □ Understand the concept of Polymorphism in Siphonophora

	➢ The student has the basic knowledge on the Corals and coral reef formation ➢ Understand Parasitic Adaptations in Helminthes ➢ Explain and describe the Evolutionary significance of Coelom and Coelomoducts and metamerism ➢ Know various types of Crustacean larvae ➢ Gain knowledge on Insect metamorphosis ➢ Explain and describe the Peripatus -Structure and affinities ➢ The student has the basic knowledge on the Pearl formation ➢ Understand Torsion and detorsion in gastropods ➢ Explain Water vascular system in starfish ➢ Explain and describe the Echinoderm larvae and their significance
Course: Sem II Paper 2 **Animal Diversity-Vertebrates**	After successfully completing this course, students will be able to: ➢ Explain and describe the General characters ,classification and up to classes with examples of Hemichordata, Urochordata, Cephalochordata, Cyclostomata, Pisces ,Amphibia,Reptilia, Aves, Mammalia ➢ Explain and describe the Anatomy of (Digestive system,respiratory system,circulatory system,nervous system) Scoliodon, Rana tigrina, Calotes, Columba livia, Rabbit. ➢ Explain Balanoglossus -Structure and affinities ➢ Understand Salient features of Urochordata ➢ Gain knowledge on Retrogressive metamorphosis and its significance in Urochordata ➢ Know Salient features and affinities of Cephalochordata ➢ The students will be able to Compare the Petromyzon and Myxine ➢ Understand different types of Scales and types of Fins in fishes ➢ Understand Parental care in amphibian; neoteny and paedogenesis ➢ Temporal fossa in reptiles and its evolutionary importance ➢ Compare Distinguished characters of Poisonous and Non poisonous snakes. ➢ Gain knowledge on Migration in Birds ➢ Gain knowledge on Flight adaptation in Birds ➢ Know Dentition in mammals. ➢ Explain Aquatic adaptations in Mammals.

B. Sc. (Zoology) Second Year

Sem & Paper	Course Outcomes (COs)
Course: Sem III Paper 3 **Animal Physiology, Animal Behaviour and Developmental Biology**	After successfully completing this course, students will be able to: ✧ Define the basic terms in physiology. ✧ List the various types of digestive enzymes. ✧ Explain the physiological processes in mammals. ✧ Explain the anatomy of various systems. ✧ Illustrate the reproductive cycles with hormonal control. ✧ Diagrammatically represents the working of the kidney. ✧ Justify the endocrine disorders. ✧ Types of Behavior:-Taxes, Reflexes, Tropisms, Instinctive and ✧ Motivated behavior. ✧ Physiology and phylogeny of learning:-Imprinting, habituation, ✧ Classical conditioning, Instrumental conditioning and trial and error ,learning. ✧ Social behavior, Communication, Pheromones ✧ Biological rhythms:-Types. ✧ Familiar with various stages involved in the developing embryo ✧ Apply the knowledge to collect various Biological data ✧ Understand the initial development al procedures involved in Amphioxus, frog and chick ✧ Familiar with types of placenta Ability to explain various Prenatal Diagnosis ✧ Familiarize with the principle of developmental biology ✧ Familiarize with various Techniques and tools of Embryology
Course: Sem IV Paper 4 Cell Biology, Genetics, Evolution and Zoogeography.	After successfully completing this course, students will be able to: ✧Differentiate prokaryotic and Eukaryotic cells. ✧Explain the principles of staining. ✧Describe the structure and functions of cell organelles. ✧Label the various cell parts and Cell organelles. ✧Explain the cell division process and its significance. ✧Explain Mendel's principle, its extension and chromosomal basis and determination of gene action from genotype to phenotype and concepts of inheritance. ✧Define the terminologies in genetics. ✧Describe the chromosome anomalies and associated diseases ✧After successfully completing this course, students will be able to: ✧Define organic evolution. ✧Explain the theories of organic evolution. ✧Describe the concept of origin of life and theories of origin of life. ✧Struggle for existence; variation; and inheritance. ✧Describe the evolution of man. ✧Illustrate the presence of organisms at various geological time scale. ✧Apply the knowledge in relevant experimentations.

B. Sc. (Zoology) Third Year

Sem & Paper	Course Outcomes (COs)
Course: Sem V Paper 5 **Physiological Chemistry/ Immunology / Diagnostic Methods of Parasites / Animal Biotechnology**	After successfully completing this course, students will be able to: ➢ Define the basic terms in biochemistry. ➢ Explain the structure, functions and reactions of the various biomolecules. ➢ Give examples of each group type of biomolecules. ➢ Correlate the changes in the levels of these biomolecules with the diseases in human ➢ Calculate pH and pOH of buffer solution. ➢ Classify the biomolecules. ➢ Draw the structures of major biomolecules. Define the basic terms in parasitology. ➢ List common ectoparasites and endoparasites. ➢ Explain animal associations and their types. ➢ Discuss the life cycle and importance of major parasites. ➢ Illustrate transmission routes of animal and zoonotic parasites. ➢ Justify the control measures of arthropod vectors. ➢ Convince the importance of hygiene with respect to epidemic diseases. ➢ List the primary and secondary immune organs. ➢ Explain the concepts of immunity, self-nonself immune response, autoimmune disease. ➢ Explain the theories of antibody synthesis and generation of antibody diversity. ➢ Explain the principle and application of the common techniques used in Immunology.

	➢ Illustrate the events and dynamics of inflammation ➢ Compare the MHC molecules and diseases associated with HLA. ➢ Differentiate between active and passive immunization ➢ Define basic terminologies of metabolic pathways. ➢ Explain the laws of thermodynamics, concept of free energy and ATP as currency molecules. ➢ Describe the Concepts and regulation of metabolism. ➢ Discuss the oxidation of fatty acids and its significance. ➢ Illustrate the electron transport chain and oxidative phosphorylation. ➢ Illustrate the reactions, energetics and regulation of glycolysis, glycogen biosynthesis, ➢ TCA cycle, Purine and Pyrimidine metabolism ➢ Write the general reactions of various metabolic pathways. ➢ Justify the role of enzymes in metabolism ➢ Compare the three pathways of complement fixation pathway
Course: Sem VI Paper 6 **Fisheries / Limnology / Vector Biology / Laboratory Animals Maintenance and Applications**	After successfully completing this course, students will be able to: ➢ Identify the fish diseases and the causative organisms. ➢ Mention the various composite fish culture with significance of each type. ➢ Describe the methods of freshwater prawn culture and its management. ➢ Explain the methods of pearl culture and pearl harvesting. ➢ Illustrate the preparation and management of fish culture ponds. ➢ Demonstrate the methods of packaging and transport of fish and brood fish. ➢ Illustrate techniques of fish harvesting, preservation & processing. ➢ Compare the techniques used in fishery development ➢ List the environmental challenges and their remedies. ➢ Describe the nature of ecosystem, productivity, food webs, energy flow, ➢ Describe the resilience of ecosystem and ecosystem management. ➢ Explain Biosphere, biomes and impact of climate on biomes. ➢ Explain wildlife management in India and conservation of wildlife. ➢ Explain the three necessary and sufficient conditions i.e ➢ Illustrate the toxic effects of chemicals in the environment on humans and his livestock.

	➢ Discuss natural resources, causes of their depletion and their conservation. ➢ Introduction to Insects ,General Features of Insects, Morphological features, Head – Eyes, Types of antennae, Mouth parts w.r.t. feeding habits ➢ Brief introduction of Carrier and Vectors (mechanical and biological vector), Reservoirs, Host-vector relationship, Vectorial capacity, Adaptations as vectors, Host Specificity ➢ Classification of insects up to orders, detailed features of orders with insects as vectors – Diptera, Siphonaptera, Siphunculata, Hemiptera ➢ Describe the Dipterans as important insect vectors – Mosquitoes, Sand fly, Houseflies; Study of mosquito-borne diseases – Malaria, Dengue, Chikungunya, Viral encephalitis, Filariasis;Control of mosquitoes ➢ Describe the Study of sand fly-borne diseases – Visceral Leishmaniasis, Cutaneous Leishmaniasis, Phlebotomus fever; Control of Sand fly ➢ Study of house fly as important mechanical vector, Myiasis, Control of house fly ➢ Fleas as important insect vectors; Host-specificity, Study of Flea- borne diseases – Plague, Typhus fever; Control of fleas ➢ Describe the Human louse (Head, Body and Pubic louse) as important insect vectors; Study of louse-borne diseases –Typhus fever, Relapsing fever, Trench fever, Vagabond's disease, Phthiriasis; Control of human louse ➢ Describe the Bugs as insect vectors; Blood-sucking bugs; Chagas disease, Bed bugs as mechanical vectors, Control and prevention measures .

Department of Mathematics: PO's, PSO's and CO's:

1. MPC - Maths, Physics, Chemistry
2. MPCs - Maths, Physics, Computer Science
3. MECs - Maths, Economics, Computer Science

I. Program Learning Objectives

1	**B.Sc. (MPC)** Mathematics, Physics, Chemistry	• To equip students with requisite theoretical and practical skills to enable them to pursue multidisciplinary courses at Postgraduate level. • To develop a sense of inquiry and scientific temper among students and shape their attitudes to help them gain higher order and experiential knowledge. • To develop a sufficient knowledge base among students and enable them to obtain placement opportunities and face competitive examinations.
2	**B.Sc. (MPCs.)** Mathematics, Physics, Computer Science	
3	**B.Sc. (MECs.)** Mathematics, Economics, Computer Science	

II. Program Outcomes and Program Specific Outcomes

S. No.	Program	Program Outcome	Program Specific Outcome
1	**B.Sc. (MPC)** Mathematics, Physics, Chemistry	Possess a sound understanding of the theoretical foundations of various core subjects. Acquire analytical and logical thinking skills necessary to pursue higher education. Gain employment at entry level positions based on program curriculum.	● The combination integrating all Basic Science courses lays a strong foundation and prepares the learner for Post Graduation research in respective disciplines.
2	**B.Sc. (MPCs.)** Mathematics, Physics, Computer Science		● Master a broad set of knowledge concerning the fundamentals in the basic areas of Physics and Mathematics added with the necessary hands-on experience in various practical aspects of problem solving/programming/ experimentation. The program imparts students with an understanding of the basics of Computer Science, to develop proficiency in the practice of computing, and to prepare them for continued professional development
3	**B.Sc. (MECs.)** Mathematics, Economics, Computer Science		● Mathematics added with the necessary hands-on experience in various practical aspects of Economic Survey and Charts of Surveying methods are developed.

III. Course Outcomes:

- ✓ Demonstrate basic manipulative skills in algebra, geometry, trigonometry and beginning calculus.
- ✓ Apply the underlying unifying structures of mathematics and the relationships among them.
- ✓ Demonstrate proficiency in writing proofs.
- ✓ Investigate and apply mathematics problems and solutions in a variety of contexts related to science, technology, business and industry and illustrate these solutions using symbolic, numeric or graphical methods.
- ✓ Students can understand the foundation of Mathematics.
- ✓ They are able to perform basic computation in higher Mathematics.
- ✓ Students are able to develop problem solving skills.

MAT 1.1	Differential and Integral Calculus	CO1	Understand how to calculate Partial Differentiation
		CO2	Understand Theorems on Total Differentials, Composite Functions, Maxima and Minima of functions of two variables – Lagrange's method of Undetermined multipliers
		CO3	Understand the Curvature , Evolutes and Envelopes
		CO4	Understand Length of Plane Curves, Volume and Surface of Revolution
MAT 1.2	Differential Equations	CO1	Understand how to differentiate linear and nonlinear,
		CO2	understand some basic definitions, Find the envelopes and orthogonal trajectories
			of the family of different surfaces
		CO3	Understand How to resolve the differential equations into rational and solve them. Solve equations for p, x and y, explain Clairaut's equation
		CO4	Will be able to find solution of higher-order linear differential equations, Uses the method "variations of parameters" to find to solution of higher-order linear
			differential equations with variable coefficients, Solves the Cauchy-Euler equations
MAT 1.3	Real Analysis	CO1	Understand the concepts of limits, Continuity, Discontinuity, Uniform Continuity
		CO2	Analyze Derivatives and apply Mean value Theorems
		CO3	Understand the Concept of Sequences and Series and interpret series Tests
		CO4	Identify Riemann Integral functions
MAT	Abstract	CO1	Trained in the Basic concepts of Groups, Subgroups

1.4	Algebra	CO2	Apply the learned concepts to Normal subgroups, Homomorphism and Cyclic
			groups
		CO3	Attain knowledge in Rings, Sub rings, Ideals
		CO4	Further learn Isomorphisms and polynomial rings
MAT 1.5.1	Linear Algebra	CO1	Vector Spaces, Sub Spaces, Linear Combination, Dimension of Vector Space and
			Subspace. Definitions, Operations on vectors and scalars.
		CO2	Rank and Nullity of Linear Transformations, Invertible Linear Transformations.
		CO3	Understand Diagonalization, Eigenvalues, Eigen vectors and Applications to Differential Equations
			Understand Orthogonality and Least Squares- Inner Product Space, Length, Orthogonal Projection
MAT 1.5.2	Three Dimensional Geometry	CO1	understand geometrical terminology for angles, triangles, quadrilaterals and circles,
			measure angles using a protractor, use geometrical results to determine unknown angles
		CO2	Understand the equation of the tangent plane and use the tangent plane as a local
			linear approximation to the surface
		CO3	Understand how to use cylinder and cone, Identify the shape of the surface of a
			cylinder and cone, Measure the surface area of a cylinder and a cone, finding volume of a cylinder and cone.
MAT-1.6.1	Numerical Analysis	CO1	Analyze and detect different forms of errors and also will be able to solve Algebraic and Transcendental equations using different methods.
			Interpolate the functions within the range using equally and unequally spaced points Interpolate the functions within the range using equally and unequally spaced points
		CO2	Upon completion of this module the student should :
			Understand the Least Squares Method
			· Be able to curve fit data using several types of curves(straight line, second degree parabola, power curve, exponential curve)
			· Obtain numerical approximations to the first and second derivatives of certain functions
			· Calculate a definite integral using an appropriate numerical method
		CO3	To solve the solution of a linear system of equations using direct or iterative methods.
			To solve the selected class of differential equations using Taylor, Picards, Euler's, Runge Kutta, Adams and Milne's

MAT-1.6.2	Vector Calculus	CO1	Understand the concepts of vectors and scalars and will be able to perform the calculations on dot, cross and triple products.
		CO2	Understand space curves and partial derivatives of vectors as well perform
			calculations on gradient t, divergence and curl operators.
		CO3	Analyze line, surface and volume integrals and estimate the change of order of
			integration as well as the change of variable in double integration

Department of Physics:

After completion of B.Sc program with Physics a student can achieve under given program outcomes, program specific outcomes, and course outcomes.

Programme Outcome

Physics studies about matter and its motion along with related concepts such as force and energy. The scope of Physics ranges between a tiny sub- atomic particle to the law of the constellation in the universe. Physics deals with a wide variety of systems and theories which were experimentally tested. Physics uses mathematics to organize and formulate experimental results and from which new predictions can be made. Physics provides an interesting and active area of research.

Program Specific Outcome

The Students gain knowledge about the motion of objects using classical mechanics. The Students undergo a detailed study of atoms and the behavior of atoms in various states.

Course Outcomes:

- ✓ The students will be able to understand the basic principles and concepts in Mechanics, Thermodynamics, Electromagnetism, Modern Physics and Optics.
- ✓ Gain Knowledge in experimental design, implementation, analysis of experimental data and numerical and mathematical methods in problem solutions
- ✓ The students will effectively communicate their knowledge of physics from basic concepts to specific detailed presentations.
- ✓ Students learn about day to day physical events such as gravity, friction, motion, speed, sound and light etc.,

Course outcomes of B.Sc, Physics:

Semester	Topics	Course outcomes (COs)
Course : Sem I, Mechanics	Vector analysis Mechanics of particles Central forces Theory of relativity	➢ To know the concept of vectors and scalars, their fields, gradient, divergence, curl ,types of integrations, Stokes ,gauss divergence ,Green's theorems.
		➢ To apply these concepts in constructing dams, buildings, road ways, railways.
		➢ To know the principles of motors, vehicles, rockets,
		➢ To know the motion of planets under gravitational force, motion of satellites
		➢ To know the presence of ether in the universe, Einstein mass energy relation
Semester - II, Waves and Oscillations	Fundamentals of Vibrations, Damped and Forced Oscillations, Vibrating Strings , Vibrations of Bars	CO-1: Know the concept of simple harmonic motion
		CO-2: To derive & solve differential equation of S.H.M.
		CO-3: To study examples of S.H.M. like Compound pendulum, Torsion pendulum, etc.
		CO-4: To understand the above concepts through experiments in the laboratory.
		CO-5: To develop numerical solving techniques in students. (Numerical based on syllabus)
		CO-6: Know the damped & forced harmonic motion.
		CO-7: To understand resonance & its types.
		CO-8: To study superposition of two S.H.M.s (parallel & perpendicular)
		CO-9: To understand the above concepts through experiments in the laboratory.
		CO-10: To develop numerical solving techniques in students. (Numericals based on syllabus)
Semester - III, (Thermodynamics)	Kinetic Theory of Gases, Thermodynamics, Thermodynamic Potentials, Low Temperature Physics, Quantum Theory of Radiation, Statistical Mechanics	➢ To know the Properties of gas like thermal conductivity, Coefficient of viscosity, diffusion.
		➢ To know the Kelvin temperature, entropy and entropy of the universe, reversible and irreversible processes.
		➢ To understand the Maxwell thermodynamic potentials, liquefaction of gasses
		➢ To understand the black body radiation, calculation of temperature of the sun ,pyrometers.
		➢ To gain the knowledge of statistical methods of B_E,F-D,M-B statistics
Semester -IV, (Optics)	Interference, Diffraction, Polarization, Aberrations and Fiber Optics	➢ To understand the concepts of interference, applications,
		➢ To understand the concepts of Diffraction patterns.
		➢ To know the polarization of light, different methods of Polarization, Nicol prism

		➢ To understand the concepts of aberrations and elimination methods, To know the principles, working and applications of fiber optics
Semester –V- Electromagnetism	Electrostatics, Magnetostatics, Electromagnetic Induction, Electromagnetic Waves	➢ To know and understand the concepts of electrostatics and magnetostatics, and know their Applications
		➢ Effects of electromagnetism
		➢ To derive maxwell equations and their applications
		➢ To understand the magnetic fields due to the current carrying conductor, solenoid...
Solid state Physics, (Paper-VI)	Solid state Physics	➢ To know the crystal structures, Different crystal structure,
		➢ To understand the miller indices, brave lattice, bragg's law
		➢ To understand the X-Ray diffraction
		➢ To know the different types of magnetic materials and the respective theories
		➢ To understand & differentiate the materials based on band theory.
		➢ To understand Hall Effect & its applications
		➢ To know what is a Laser, Types & their applications
		➢ To understand the concept of superconductivity, Types and applications, London's equations
Course: Sem VI-Modern physics (VII Paper)	Atomic Spectra and Models Inadequacy of Classical Physics, Quantum Physics, Nuclear Physics, Radioactivity	➢ To understand the Structure of Atoms with the help of Atomic Models like Bohr, Sommerfeld Atomic Models...
		➢ To understand the concept of Spectrum with the help of Atomic Models
		➢ To know the Schrödinger wave equations & its types & applications
		➢ To understand the basic concepts of de-Broglie hypothesis, Heisenberg's Uncertainty principles, Group & Phase velocities,...
		➢ To know the structure and properties of nucleus'
		➢ To know the nuclear models.
		➢ To develop the concepts of radioactivity, nuclear fusion and fission.
		➢ To understand the liberation of stellar energy
(VIII) paper Basic Electronics	Network Elements and Network Theorems, Band Theory of P-N Junction, Bipolar Junction Transistor & Feedback Concept & Oscillations,	➢ To understand the network Models like T, Pi, & Theorems like Thevenin's, Norton's, Superposition, Reciprocity theorems...
		➢ To solve the complex network problems
		➢ To understand the band theory of solids, P-N junction diode formation.
		➢ To understand the working of Junction Diode, Zener Diode...
		➢ To know the regularization of voltage using zener diodes.
		➢ To understand the working of

	Digital Electronics & Logic Gates	PNP & NPN transistors, Feedback Concept & Oscillators and their applications in our daily life.
		➢ To know the digital principles, conversion of different number systems like Binary, Decimal, Hexa-decimal....
		➢ To understand the working of Logic gates like OR, AND, NOT, NAND, XOR gates.
		➢ To understand the De-morgan's Laws.

DEPARTMENT OF CHEMISTRY

Programme outcomes:

1. The chemistry department pledges staff to encourage in this broadest and liberal manner the advancement of science and particularly chemistry in all of its branches.
2. Create an academic environment which promotes the intellectual and professional development of students.
3. Develop and maintain a commitment to scholarly activity in research and undergraduate education which is commensurate with the goals and mission of Dr. BRR Government College, Jadcherla.
4. Graduating national provisionally qualified Personal who is necessary for the service of the community and the government plans and programs of development, education and industry within the Kingdom.
5. Contributing to the improvement of the public at the scientific cultural awareness via the academic conferences and workshops.
6. Providing technical services in the field of chemistry to both public and private sectors.

Programme Specific Outcomes:

1. Students will be able to have Clear understanding of the fundamental concepts in Organic, Inorganic, Physical and Analytical Chemistry.
2. Students will be able to have the ability to perform scientific experiments skillfully by application of procedural knowledge.
3. Students will be able to have ideas about research in chemistry and knowledge of the significance of the scientific concepts learnt which find application in industry, medicine and modern research.
4. Students will be able to have Capacity of work in research labs and related fields.
5. Students get the ability to explain chemical nomenclature, structure, reactivity and function in their specific field of chemistry.

Course Outcomes:

B. Sc Chemistry - Semester I-Paper – I

S1-CO1: Describe the synthesis & list the various types of B, C, Si & N Compounds.

S1-CO2: Interpret the diagonal relationship of s block elements & Understand physical & chemical reaction of Aliphatic & Alicyclic hydrocarbon

S1-CO3: Based on bond polarization acidity & basicity & stability of Reactive intermediate of different hydrocarbons can be determined

S1-CO4: By considering principles of solubility product & common ion effect cation can be discriminated by anions in a salt mixture

S1-CO5: Have an idea of critical & van der waals constant .By taking the criteria of wave function particle in a 1D box can be explained

S1-CO6: Predict the bond order & magnetic behavior for various molecules on the basis of MOED. In a given, mathematical data, accuracy, precision & error can be explained.

B. Sc Chemistry - Semester II-Paper – II

S2-CO1: Acquire Knowledge about various preparation and chemical reactivity of aromatic compounds , halogen compounds and alkyl benzene.

S2-CO2: Able to understand the physical and chemical properties of oxides, Oxy- acids of p and d- block elements

S2-CO3: The study of colligative properties helps to determine Molecular masses of solutes, Nernst distribution law used to determine association & dissociation of solute in solvent, by using Bragg's equation various crystal structure can be determined & by qualitative analysis one can determine the weight of chemical substances

S2-CO4: Band theory is useful to differentiate between conductors, insulators & semiconductors. Have an idea about material science

S2-CO5: By kinetic study one can judge the order of reaction of halogen compound & by taking criteria of optical activity one can express the stereochemistry of SN1 &SN2.

S2-CO6: Predicting the symmetry elements in various crystal lattices, The aromaticity of aromatic compounds can be predicted by Huckel's rule.

B. Sc Chemistry - Semester III-Paper – III

S3 CO1: Defines the properties of f-block elements and non- aqueous solvents

S3CO2: Differentiate the symmetry elements, operations in molecules, lanthanides and actinides

S3CO3: Explore the methods of preparation and properties of alcohols, ethers and carbonyl compounds and current applications

S3CO4: Design the Phase equilibria of one component and two component system ,compound with congruent and incongruent melting point.

S3 CO5: Demonstrate the methods of preparations and properties, of colloids, Analyze adsorption isotherms and its industrial applications to reduce pollution and compute the surface area of adsorbent

S3CO6: Know the synthetic techniques of Nano structured materials, its current applications.
S3 CO7: Classify stereoisomers based on symmetry criteria and energy criteria.
S3CO8: Interpret R And S configuration, D/L Nomenclature and E/ Z Configuration.
S3 CO9: Predict the Conformations of simple organic molecules.

B. Sc Chemistry - Semester IV-Paper – IV

S4CO1: Describe the postulates and limitations of Werner's theory, Sidwick's and VBT theory.
S4CO2: Acquire knowledge on the IUPAC Nomenclature and solve the EAN of coordination compounds.
S4CO3: Categorize the Organometallic compounds of Li Mg Al abd Metal carbonyls.Discuss its applications.
S4CO4: Understand the preparation methods and its synthetic applications in the industry of carboxylic acids and carbanions.
S4CO5: Have an idea on all named reactions and mechanisms of carboxylic acids and nitro hydro compounds and focus on its industrial applications.
S4CO6: Acquire knowledge on Hittof's method ,Kholrausch law, Arrhenius theory,Ostwald dilution law,DebyeHuckle Onsager equation and predicts its applications.
S4CO7: Accomplish the Nernst equation, EMF of a cell, Single electrode potential, Standard hydrogen electrode, electrochemical series.

B. Sc Chemistry - Semester V-Paper – V

S5CO1: Understand the theories of coordination compounds and stability of metal complexes.
S5CO2: List and judge the applications of coordination compounds in various fields
S5CO3: Know about the clusters with the examples of Borane and carborane
S5CO4: Compare the property and reactivity of different class of amines and design the synthesis pathway of different organic compounds using amines
S5CO5: Classify heterocyclic compounds and compare their aromatic character and reactivity.
S5CO6: Develop concept on reaction kinetics with special reference to factors influencing the rate and evaluate the merits of different theories of reaction rate
S5CO7: Know about electromagnetic radiation and understand the interaction of electromagnetic radiation with molecules of various types of molecular spectra.
S5CO8: Learn to analyze the consequences of light absorption with reference to various photo physical processes and photochemical reactions with normal and abnormal quantum yield.

B. Sc Chemistry - Semester V-Paper – VI

S6CO1: Acquire the knowledge of principle and methods of solvent extractions and their application.

S6CO2: Understand the classification of Chromatographic methods, principle, nature of adsorbents and solvent systems.

S6CO3: Understand and evaluate Principle, Instrumentation and application of TLC, Paper chromatography, Column chromatography, IEC, GC, HPLC techniques.

S6CO4: Illustrate general features of absorption, its laws.

S6CO5: Acquire the Knowledge of Instrumentation of Spectrophotometry, its principle and with their application in estimation of Iron, Chromium and Manganese in Steel.

S6CO6: Know about the types of electroanalytical methods.

S6CO7: Analyze the principles, types of electrodes used and applications of potentiometry, Voltammetry and conductometry.

B. Sc Chemistry - Semester VI-Paper – VII

S7CO1: Understand the concept of Inorganic reaction mechanism with respect to octahedral and tetrahedral complexes

S7CO2: Know about the Biological significance of essential elements and toxicity of heavy metals

S7CO3: Acquire knowledge about carbohydrate chemistry with reference to definition, classification and evaluation of structure from reactions.

S7CO4: Acquire knowledge about chemistry of amino acids – essential amino acids, Biological importance. Learn to relate the peptide bond formation for the synthesis of protein

S7CO5: Have an extensive knowledge on Thermodynamics with reference to different Thermodynamic functions, processes, work of expansion and laws of Thermodynamics

S7CO6: Understand the applications of Thermodynamics in basic sciences for deriving equations, in engineering science for calculating efficiency of machines and evaluation of spontaneity of process. Learn to derive the equation of spontaneity, Gibb's equation and Maxwell's relations

S7CO7: Understand the principle of Nuclear Magnetic Resonance, concept of chemical shift and splitting of signals – spin –spin coupling. Implement the concept in analyzing the NMR spectrum for identification of organic compounds

S7CO8: Understand the basic principle of mass spectrometry and learn to determine the mass spectral pattern of different organic compounds.

B. Sc Chemistry - Semester VI- Paper – VIII

S8 CO1: Recalling Infective and hereditary diseases.

S8CO2: Know about the terminology in medicinal chemistry and Nomenclature of Drugs.

S8CO3:Understand ADME of Drugs.

S8CO4: Acquire the knowledge of mechanism of action of drugs and factors affecting action of Enzyme and Receptors.

S8CO5: Evaluate the Synthesis and therapeutic activity of Drugs related to Chemotherapeutics, acting on metabolic disorders and acting on the nervous system.

S8CO6: Analyzing the function of molecular messengers and health promoting drugs.

Department of Computer Science

Program Outcome

- ✓ A graduate with a B.Sc. in Computer Science will have the ability to demonstrate techniques of Computer Science in the following core knowledge areas of Data Structures, Programming Languages(C, C++, Java), Databases (DBMS,RDBMS), Software Engineering and Development.
- ✓ Computer Science education at undergraduate level (+3) will result in earning a Bachelor of Science (BSc) degree in CS. The coursework required to earn a BSc is equally weighted in mathematics and science.
- ✓ Computer Science (CS) has been evolving as an important branch of science and engineering throughout the world in last few decades
- ✓ Apply problem-solving skills and the knowledge of computer science to solve real world problems.

Program Specific Outcome:

- ✓ B.Sc in Computer Science is aimed at undergraduate level training facilitating multiple career paths.
- ✓ Demonstrate basic knowledge of computer applications and apply standard practices in programming languages such as , Java, C++, C- Language etc.
- ✓ Understand, analyze and Develop computer programs for efficient design of websites and databases.
- ✓ As a CS, graduate, one can fetch employment directly in companies as Web Developer, Software Engineer, Network Administrator, Data Scientist, or AI/ML personnel etc.,
- ✓ Students who have graduated, can take up postgraduate programmes in CS leading to research as well as R&D, can be employable at IT industries, or can adopt a business management career.
- ✓ Procedural knowledge that creates different types of professionals related to Computer Science, including research and development, teaching and industry, government and public service;
- ✓ Skills and tools in areas related to computer science and current developments in the academic field of study.
- ✓ Apply Computer Science knowledge and transferable skills to new/unfamiliar contexts.

Course Outcomes

As a Computer Science graduate student gains the various programming languages , their advantages and limitations of those technologies. The core subjects and course outcomes of

B.Sc(Computer Science) are below.

PROGRAMMING IN C AND C++

1. Learn to develop simple algorithms and flow charts to solve a problem.
2. Develop problem solving skills coupled with top down design principles.
3. Learn about the strategies of writing efficient and well-structured computer algorithms/programs.
4. Develop the skills for formulating iterative solutions to a problem.
5. Learn array processing algorithms coupled with iterative methods.
6. Learn text and string processing efficient algorithms.
7. Learn searching techniques and use of pointers.
8. Understand recursive techniques in programming.

DATA STRUCTURES

- To be familiar with fundamental data structures and with the manner in which these data structures can best be implemented; become accustomed to the description of algorithms in both functional and procedural styles
- To have knowledge of the complexity of basic operations like insert, delete, search on these data structures.
- Ability to choose a data structure to suitably model any data used in computer applications.
- Design programs using various data structures including hash tables, Binary and general search trees, heaps, graphs etc.
- Implement and know the applications of algorithms for sorting, pattern matching etc.

OPERATING SYSTEM

1. Describe the important computer system resources and the role of operating systems in their management policies and algorithms.
2. To understand various functions, structures and history of operating systems and should be able to specify objectives of modern operating systems and describe how operating systems have evolved over time.
3. Understanding of design issues associated with operating systems.
4. Understand various process management concepts including scheduling, synchronization, and deadlocks.
5. To have a basic knowledge about multithreading.
6. To understand concepts of memory management including virtual memory.
7. To understand issues related to file system interface and implementation, disk management.
8. To understand and identify potential threats to operating systems and the security features designed to guard against them.
9. To have sound knowledge of various types of operating systems including Unix and Android.

COMPUTER NETWORKS

1. Understand the structure of the Data Communications System and its components. Be familiar with different network terminologies.
2. Familiarize with contemporary issues in network technologies.
3. Know the layered model approach explained in OSI and TCP/IP network models
4. Identify different types of network devices and their functions within a network.
5. Learn basic routing mechanisms, IP addressing schemes and internetworking concepts.
6. Familiarize yourself with IP and TCP Internet protocols.
7. To understand major concepts involved in the design of WAN, LAN and wireless networks.

8. Learn basics of network configuration and maintenance.
9. Know the fundamentals of network security issues.

SOFTWARE ENGINEERING

1. Basic knowledge and understanding of the analysis and design of complex systems.
2. Ability to apply software engineering principles and techniques.
3. To produce efficient, reliable, robust and cost-effective software solutions.
4. Ability to work as an effective member or leader of software engineering teams.
5. To manage time, processes and resources effectively by prioritizing competing demands to achieve personal and team goals Identify and analyze the common threats in each domain.

DATABASE MANAGEMENT SYSTEMS

1. Gain knowledge of database systems and database management systems software.
2. Ability to model data in applications using conceptual modeling tools such as ER Diagrams and design database schemas based on the model.
3. Formulate, using SQL, solutions to a broad range of query and data update problems.
4. Demonstrate an understanding of normalization theory and apply such knowledge to the normalization of a database.
5. Be acquainted with the basics of transaction processing and concurrency control.
6. Familiarity with database storage structures and access techniques.
7. Compare, contrast and analyze the various emerging technologies for database systems such as MySQL.
8. Analyze strengths and weaknesses of the applications of database technologies to various subject areas.

OBJECT ORIENTED PROGRAMMING

1. Learn the concepts of data, abstraction and encapsulation
2. Be able to write programs using classes and objects, packages.
3. Understand conceptually principles of Inheritance and Polymorphism and their use and program level implementation.
4. Learn exception and basic event handling mechanisms in a program
5. To learn typical object-oriented constructs of specific object oriented programming language

WEB TECHNOLOGIES

1. To understand the terms related to the Internet and how the Internet is changing the world.
2. To understand how computers are connected to the Internet and demonstrate the ability to use the World Wide Web.
3. Demonstrate an understanding of and the ability to use electronic mail and other internet based services
4. Understand the design principles of Web pages and how they are created
5. To develop an ability to create basic Web pages with HTML.

PROGRAMMING IN JAVA

1. Knowledge of the structure and model of the Java programming language,
2. Use the Java programming language for various programming technologies
3. Develop software in the Java programming language,
4. Evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements

Department of Microbiology:

Program Outcomes:

- ✓ Students of the B.Sc. Microbiology Program will learn various aspects of basic microbiology such as Bacteriology, Virology, Biochemistry, Microbial Physiology, Immunology, Cell Biology, Molecular Biology, Genetics, Systems Biology, Immunology and Molecular biology, in addition to becoming aware of the applied aspects of microbiology such as Industrial Microbiology, Food and Dairy Microbiology, Environmental Microbiology and Medical Microbiology.
- ✓ Students will become familiar with scientific methodology and execution of experiments.
- ✓ Students will acquire and demonstrate proficiency in good laboratory practices in a microbiological laboratory and be able to explain the theoretical basis and practical skills of the tools/technologies commonly used to study this field.
- ✓ Students will develop strong oral and written communication skills through the effective presentation through discussions and student seminars.
- ✓ They are able to understand and evaluate the impact of new research discoveries in the life sciences and will be able to pursue a wide range of careers, including biological and medical research in higher education institutions as well as careers in public and global health, environmental organizations, and food, pharmaceuticals and biotechnology industries.

Programme Specific Outcomes:

GENERAL MICROBIOLOGY

1. To gain a preliminary understanding about the history and developments in Microbiology
2. To familiarize with Microbiological techniques.
3. Understand the principle of work, energy and power
4. To develop interest in control measures of pathogens and other microbes

MICROBIAL TAXONOMY

1. To gain a preliminary understanding about the classification methods in Microbiology
2. To familiarize with different groups of microorganisms
3. To develop interest in systematics

BIOCHEMISTRY FOR MICROBIOLOGY

1. To gain an understanding about essential Biochemistry required for Microbiology students
2. To develop interest in the chemistry of life.

MICROBIAL PHYSIOLOGY

1. To gain a preliminary understanding about microbial nutrition.
2. To familiarize with energy production in microorganisms

MOLECULAR BIOLOGY

1. To gain an understanding about essential Molecular Biology required for Microbiology students
2. To develop interest in the chemistry of life.

MICROBIAL GENETICS & GENETIC ENGINEERING

1.To gain a preliminary understanding about the genetic changes in microorganisms
2. To familiarize with applied aspects of genetic engineering
3. To create interest in various aspects of development of GMO

IMMUNOLOGY

1. To gain a preliminary understanding about various immune mechanisms.
2. To familiarize with Immunological techniques
3.To develop interest in serodiagnosis of infectious diseases

MICROBIAL BIOTECHNOLOGY

1. To gain preliminary understanding about fermentation technology.
2. To familiarize with microbial products by fermentation process.
3. To develop interest in bioinsecticides

BACTERIAL DISEASES

1. To gain understanding about various pathogenic microorganisms.
2. To familiarize with symptoms of common infectious diseases and their diagnostic procedures and to develop interest in prophylactic measures of infectious diseases

ENVIRONMENTAL MICROBIOLOGY

1. To gain a preliminary understanding about Environmental Microbiology
2.To enhance awareness about xenobiotic pollution
3.To develop interest in bioremediation

VIROLOGY, MYCOLOGY AND PARASITOLOGY

1. To gain a preliminary understanding about viral, fungal, protozoan and helminth pathogens
2. To develop interest in noting infectious diseases other than bacterial infection

FOOD MICROBIOLOGY

1. To gain a preliminary understanding about Food Microbiology
2. To enhance awareness about food borne diseases, microbial pathogens responsible and food safety
3. To develop interest in advanced food preservation techniques
4. To gain an understanding about food quality standards

AGRICULTURAL MICROBIOLOGY

1.To gain a preliminary understanding of Agricultural Microbiology
2. To enhance awareness about plant diseases and microbial pathogens
3. To develop interest in biofertilizers and organic farming

MICROBES AND ENVIRONMENT

1. To gain an understanding about Environmental Microbiology
2. To enhance awareness about xenobiotics and other pollution.

COs

FUNDAMENTALS OF MICROBIOLOGY

CO 1: Understand the history, development & scope of microbiology
CO 2: Understand the principle and procedure of microscopy
CO 3: Understand the detailed structure of bacteria
CO 4: Explain the techniques for visualization of microorganisms
CO 5: Explain various media and components for cultivation of different microorganisms
CO 6: Understand various techniques used for isolation and preservation of bacteria
CO 7: Understand the principle and methods for controlling microorganisms and attain knowledge in controlling microbes in day today life.

MICROBIAL DIVERSITY

CO 1: Understand the basics and tools in Microbial taxonomy
CO 2: Explain classification and diversity of bacteria
CO 3: Understand general characteristics and taxonomy of viruses.
CO 4: Understand general characteristics and taxonomy of fungi
CO 5: Understand general characteristics and taxonomy of microscopic algae & Protozoa

MICROBIAL PHYSIOLOGY AND METABOLISM

CO 1: Understand the nutritional diversity among microorganisms, the different macro and micronutrients required for microbial growth and understand the physical factors affecting microbial growth.

CO 2: Describe the pattern of growth, reproduction, death and growth kinetics of microbes and measure population growth by different methods.

CO 3: Understand the phototrophic nutrition in microorganisms, different mechanisms seen in different microbial groups and their ecological importance.

CO 4: Understand the unique nutritional type among microorganisms- the chemolithotrophs-, their types, use of different inorganic sources for energy production, ecological importance and role in biogeochemical cycles.

CO 5: Understand how carbohydrates, proteins and fats are metabolized in the microbial cells and the diverse metabolic pathways leading to energy production.

MICROBIOLOGY PRACTICAL

CO 1: Understand the basic rules and regulations in Microbiology lab and the procedure of cleaning & preparation of materials for lab experiments

CO 2: Understand the working and understand how to operate major microbiology lab instruments

CO 3: Understand and carry out the preparation of various media for cultivation of microorganisms

CO 4: Carry out the techniques for isolation and cultivation of bacteria

CO 5: Understand the procedure of comparing the efficiency of disinfectants commonly used

BASIC IMMUNOLOGY

CO 1: Understand various immune mechanisms

CO 2: Describe various immune cells and organs involved in immunity

CO 3: Understand different immunological techniques used and serological diagnosis of infectious diseases

CO 4: Understand the basis of allergy reactions, auto immune mechanisms, transplantation and cancer immunity.

MICROBIOLOGY PRACTICAL

CO 1: Understand the principle, parts of Compound light microscope and carry out the procedure of using Microscope

CO 2: Carry out the techniques of visualizing bacteria

CO 3: Understand and carry out the procedure of differentiating bacterial populations

CO 4: Carry out the techniques for visualizing different parts of bacteria

CO 5: Understand the procedure of separating compounds by using chromatography

MICROBIAL BIOTECHNOLOGY

CO 1: Describe about fermenter and fermentation technology.

CO 2: Understand microbial products by fermentation process.

CO 3: Understand enzyme technology and its application

BACTERIAL DISEASES

CO 1: Describe about infection, its types, transmission of infection & virulence factors

CO 2: Understand the details of causative agent of major human bacterial infection

CO 3: Understand the diagnostic & treatment methods of various bacterial infections

CO 4: Understand prophylactic measures of different bacterial diseases

CO 5: Understand epidemiological aspects of bacterial diseases

ENVIRONMENTAL MICROBIOLOGY

CO 1: Understand the concept of ecosystem and its components and concept of biogeochemical cycles and N, S and P cycles.

CO 2: Explain the principles of microbial interactions and its importance with suitable examples.

CO 3: Describe microorganisms in air, methods by which they reach and remain in air and its medical importance. Air sampling methods and its use in agriculture.

CO 4: Describe microorganisms in aquatic environment, various factors that can influence their survival and distribution in different aquatic systems. Their role in the aquatic ecosystem is the biotic factor-producer, consumer and decomposer.

CO 5: Understand the concept of xenobiotics, xenobiotics as pollutants of environment, concept of biomagnification, concept of persistence and recalcitrance of various xenobiotics. Concept of bioremediation of environment and microbial degradation of various xenobiotics.

CO 6: Understand the concepts of leaching, corrosion and microbial biofilms. Involvement of microorganisms in metal leaching and corrosion.

VIRAL, FUNGAL AND PARASITIC DISEASES

CO 1: Understand the architecture of animal viruses, its classification, methods for studying viruses and the multiplication strategies of animal viruses

CO 2: Understand the most prevalent viral diseases of human beings including the emerging viral diseases and to understand the preventive measures to be taken by studying the pathogenesis and mechanism of survival of pathogens.

CO 3: Describe overview of fungal infections affecting human beings and the treatment strategies against fungal infections

CO 4: Understand important protozoan and helminthic infections of human beings

MICROBIOLOGY PRACTICAL

CO 1: Perform basic laboratory techniques in Microbiology to detect bacterial motility and use of special media in order to differentiate pathogenic microorganisms

CO 2: Understand the isolation and identification of normal flora

CO 3: Determine the effect of environmental factors influencing the growth of microorganisms

CO 4: Perform basic laboratory experiments in Biochemistry, Genetics and Bioinformatics

MICROBIOLOGY PRACTICAL

CO 1: Determine the microbial load and diversity in soil

CO 2: Determine the microbiological quality of drinking water and air

CO 3: Understand the laboratory procedure for the growth of fungi and identify thefungi by macroscopic and microscopic examination

CO 4: Isolate microorganisms with special metabolic capacities from the Environment

FOOD MICROBIOLOGY

CO 1: Understand the role of microorganisms in food fermentation, food processing, food spoilage and foodborne diseases

CO 2: Understand the significance of microbes in spoilage of different varieties of food and the role of intrinsic and extrinsic factors affecting the growth and survival of microbes in food.

CO 3: Describe ways to control the growth of microbes in foods and know the principles involved in methods of food preservation.

CO 4: Understand the beneficial role of microbes in fermented foods and the microbiology of fermented dairy products and other indigenous fermented foods and understand the basis of food safety regulations.

CO 5: Understand the role of microbes in foodborne illnesses and their characteristics and their preventive measures

AGRICULTURAL MICROBIOLOGY

CO 1: Understand the role of microbes in agriculture

CO 2: Explain the production and application of biofertilizers

CO 3: Understand plant disease mechanism and how to control plant diseases and also to get awareness on the impact of chemical fertilizer

CO 4: Understand various plant diseases commonly found.

MICROBIOLOGY PRACTICAL

CO 1: Perform Antigen – Antibody reactions for the Serodiagnosis of infectious Diseases

CO 2: Identify bacterial species from clinical samples by microscopy, Cultural characteristics and

biochemical reactions

CO 3: Determine the antimicrobial spectrum of the given bacterial species

MICROBIOLOGY PRACTICAL

CO 1: Determine the microbial count of fish, milk and fermented milk samples

CO 2: Understand the production of wine using yeast

CO 3: Analyze the microbiological quality of milk sample

CO 4: Perform experiments for the isolation of nitrogen fixing bacteria

GENERIC ELECTIVE COURSE I: FOODBORNE DISEASES

CO 1: Understand etiological agents of important foodborne infections and intoxications

CO 2: Explain the sources, symptoms and preventive measures of foodborne illnesses

CO 3: Understand the preventive and prophylactic measures of foodborne diseases.

GENERIC ELECTIVE COURSE II: MICROBES AND ENVIRONMENT

CO 1: Understand the basic concept of Ecology and factors influencing the growth of microorganisms in the environment

CO 2: Understand biogeochemical cycling in the environment and microbial interactions in the soil

CO 3: Explain the role of microorganisms causing diseases transmitted through water and the importance of indicator organisms in determining the microbiological quality of drinking water

CO 4: Understand steps involved in waste water treatment

CO 5: Explain the methods to resolve important global environmental problems

GENERIC ELECTIVE COURSE III: SOLID WASTE MANAGEMENT

CO 1: Understand the magnitude of health risk and other socio economic problems of solid waste.

CO 2: Explain methods of disposal of solid waste , hazardous solid waste and e waste

CO 3: Understand the methods for reduction of solid waste

MUSHROOM CULTIVATION AND PROCESSING

CO 1: Understand and identify the edible and poisonous mushrooms and their significance

CO 2: Create skills in mushroom cultivation methods

CO 3: Understand the marketing trends of mushroom

CO 4: Train and help students to learn a means of self employment and income Generation

FERMENTED FOODS AND BEVERAGES

CO 1: Understand the role of microorganisms in the production of fermented foods and beverages

CO 2: Understand the production of important fermented foods, beverages and single cell proteins

BIOCHEMISTRY FOR MICROBIOLOGY

CO 1: Understand the aspects of different types of bonding in biomolecules and the concept and importance of pH and redox reactions in living systems.

CO 2: Describe the detailed structure of carbohydrates with different bonding patterns, their properties, classification and functions in cells.

CO 3: Explain the structure, classification, properties of amino acids and the structure , levels of organization, types, conjugate forms and functions of protein in cells.

CO 4: Understand in detail the properties, classification, mechanism and kinetics of enzyme action and the principles of enzyme regulation.

CO 5: Describe the components, structure and organization of nucleic acids (DNA and RNA) and their functional importance in living systems.

CO 6: Understand the structure, types and properties of fats, fatty acids, lipids, their conjugate forms and their functional importance.

MOLECULAR BIOLOGY

CO 1: Understand the history of molecular biology, the experiments that proved the role of DNA as genetic material, physical and chemical properties of DNA, and organization of genetic material in cells.

CO 2: Explain mechanisms and molecules involved in replication of DNA and different models of replication.

CO 3: Describe molecular mechanisms of recombination.

CO 4: Understand chemical nature and types of RNA , transcription mechanisms and different types of molecules involved and processing of RNA

CO 5: Understand concept of genetic code and concept of translation, steps involved and post translational modification.

CO 6: Understand concept of gene regulation in prokaryotes using lac and trp operon as examples.

MICROBIAL GENETICS AND rDNA TECHNOLOGY

CO 1: Understand genomic organization of prokaryotes including bacterial chromosome, plasmids and transposable genetic material

CO 2: Understand gene transfer mechanism in prokaryotes, its applications and genetic make-up of bacteriophage and yeast briefly

CO 3: Explain molecular mechanism underlying mutations and useful phenotypes of bacterial mutants.

CO 4: Explain the basics and molecular techniques involved in recombinant DNA technology and the role of microbes in rDNA technology

CO 5: Describe the applications of transgenic plants and animals.

Department of Economics:

Program Outcome:

✓ A degree in economics provides you with a solid foundation for a career in business, government or with the non profit organization. In this Program you will study how societies, governments, households and individuals create, use, manage and distribute resources.

Course Outcomes:

✓ Understand the behavior of the Indian and world economy.

✓ To develop financial literacy for profitable investment.

✓ To make students aware of the issues of inflation, unemployment, poverty, GDP and Balance of payment.

✓ It develops the skill to make better decisions in business environments and even in your personal choices.

✓ To impart the knowledge of Banking, Marketing and different sections of economy so that students will get job opportunities in different economic, financial, banking, marketing and other sections of economy.

✓ Economists are vital in helping, predict and study responses to changes in policy and market changes, which is an important skill in today's changing business environment.

✓ Economists also study and help in developing public policies like health care and educational reforms.

Department of History

Program Outcome

History is a broad- based subject in Bachelor of Arts that has specific goals, including: engaging the mind and imagination of those who study history; introducing students to worlds, times, places and cultures including their own in a way that they have never thought before.

Course Outcomes:

✓ To create interest towards the cultural and historical background of India.

✓ To understand the various historical incidents and to help students prepare for competitive examinations.

✓ To help the students to identify and evaluate conflicting interpretations.

✓ It inspires the students through the bravery and courage of our forefather.

✓ It inculcates critical thinking, reading, writing and research skills among students.

I B.A

1 HEP - History, Economics, Political Science
2 EPP - Economics, Public Administration, Political Science
3 HPP - History, Public Administration, Political Science
4 EHPA - - Economics, History, Public Administration

Program	Program Outcome	Program Specific Outcomes
B. A. (EPP) Economics, Public Administration, Political Science	The expected outcome of the program is to give students a multidisciplinary approach that helps them build their social analytical skills and in pursuing multitasking	• A traditional combination suitable for students from urban and rural backgrounds. • Provides ample opportunities based on the choice of the student and their interest. • A special emphasis on the learning process involves relating to National and International development with a sound theoretical background. • Students with this course can go for higher education towards development studies that are restructured. • The courses allow BA graduates to pursue higher education - Law, Rights and Constitutional Governance, Gender Studies, Development Studies, Disaster Management Education, Social Work, School of Livelihoods and Development, Rural Development.

B. A. (HEP) History, Economics, Political Science		• This course has high potential which enables a student to mold according to the career path / higher studies options at Indian Council for Historical Research, New Delhi, India / National Archives//Good Governance/Centre for Gender Studies and Development
B. A. (HPP) History, Public Administration, Political Science		• A student of HPP is well grounded in the fundamentals of the core subjects namely History, Political science & Public Administration. • Any decision related to perspectives on the milieu enables them to grasp the realities. • This is the most critical input and helps in facilitating a spectrum of opportunities in policy making. • This course is basic to acquire internship in Conservation of Monuments, Indian National Trust for Art and Cultural Heritage (INTACH) and Society for the Promotion of Indian Classical Music And Culture Amongst Youth (SPICMACAY).
B .A .(EHPA) Economics, History, Public Administration		• A student of EHPA is well grounded in the fundamentals of the core subjects namely Economics, History & Public Administration. • Any decision related to perspectives on the milieu enables them to grasp the realities. • This is the most critical input and helps in facilitating a spectrum of opportunities in policy making

II. Program Learning Objectives

Programe	Learning Objectives of Programs
B. A (HEP) History, Economics, Political Science	• To enable a Graduate to acquire the basic intellectual equipment in terms of thinking ability, and reasonable knowledge in respective fields. • To provide a platform for the students to motivate themselves to equip themselves with the emerging opportunities and challenges. • To lay the foundations for a scientific perspective and create awareness about the observational and research skills.
B. A (EPP) Economics, Public Administration, Political Science	
B. A (HPP) History, Public Administration, Political Science	
B.A (EHPA) Economics, History, Public Administration	

B. A. : Course Outcomes			
Public Administration B. A. : Course Outcomes			
PUB 103	Introduction to Public Administration	CO1	Understand nature, scope of public administration and its relation with other social sciences.
		CO2	To Understand the Classical theories of public administration
		CO3	To understand the human relations theories by various thinkers
		CO4	To understand Socio- psychological approaches by various thinkers
		CO5	To Understand the comparative public administration and development administration theories
PUB 203	Development Dynamics and Emerging Trends	CO1	Appreciate the Concepts of Hierarchy, unity of Command, Span of control and the changing paradigms.
		CO2	Appreciate the Concepts of Coordination, Communication, Supervision and the changing paradigms.

		CO3	Understand the Concepts like public relations, Administrative planning of public administration from public perspective.
		CO4	Understand the Concepts like public Policy, New public Management of public administration
		CO5	Understanding the concepts LPG and Good Governance
PUB 303	Indian Administration	CO1	Analyze the evolution the Indian Administration and the constitutional framework.
		CO2	Analyze the role of president, prime minister, attorney general, NITI Aayog in the Indian Administration.
		CO3	Understand the Centre-state relations, role of All-India Services and analyze the ARC recommendations.
		CO4	Understand the role of Election Commission, CAG, and UPSC.
		CO5	Understanding the Role of Lokpal, Lokayukta, CVC and Right to information act 2005.
PUB 403	Governance at State and District Level	CO1	Analyze the role of Governor, Chief minister, Advocate General, Council of Ministers, GAD.
		CO2	understanding District Administration and Democratic decentralization
		CO3	Understand the 73 rdand 74thAmendment Act and analyzing the administration in Telangana.
		CO4	Understand the Centre state agencies of police administration and its reforms.
		CO5	Understanding and analyzing the IT initiatives in administration
PUB 503A	Human Resource Management	CO1	Understanding the Nature, Scope, Importance of Human resource Management and Human resource planning
		CO2	Understanding the concepts of office Management, Compensation Management, Functions of HRM.
		CO3	Understand Human resource development, training, performance appraisal and Total quality Management.
		CO4	Understand Employee Grievances, Voluntary retirement, Outsourcing and Skill development.
		CO5	Human Resource Management - Emerging Trends

PUB 503B	Rural Local Governance	CO1	Understanding the evolution of local organizations and democratic decentralization.
		CO2	Understanding the 73rd amendment act and role of Panchayats
		CO3	Understanding the structure of panchayat Raj and its finances from state.
		CO4	Understanding and analyzing the rural development programs, role of Cooperatives for rural development.
		CO5	Rural Local Governance - Emerging Trends
PUB 603A	Financial and Material, Resource, Management	CO1	Understanding the Meaning, Nature, Scope and Importance of Financial Management.
		CO2	Understanding the concepts, principles, preparation, Enactment of Budget
		CO3	Understand the structure of Finance ministry and functioning of different parliamentary Committees.
		CO4	Understanding the Concepts of material management, procurement, inventory Storage.
		CO5	Materials Management
PUB 603B	Urban Governance	CO1	Understanding the evolution of Unban Local bodies with reference to 74th amendment act.
		CO2	Understanding and analyzing the rural development Strategies, issues and Finances.
		CO3	Understanding the urban development authorities and the services and welfare measures.
		CO4	Understanding District and Metropolitan Committees and Agencies for urban development.
		CO5	Urban Governance - Emerging Trends

Dept. of History			
HIS 101	History of India (From Earliest Times to c.700 CE)	CO1	Understands the need to study history and the sources, literary, archaeological etc.
		CO2	The prehistoric age, Indus valley civilization , Vedic and epic ages,.
		CO3	Religious Movements , Understands the Magadha empire Alexander's Invasion.
		CO4	Mauryan Dynasty, Satavahanas; Sangam Age

		CO5	Understands the Gupta age, the golden age and Harshavardana and His Achievements.
HIS 202	History of India (c.700-1526 CE)	CO1	Brief History of Rajputs, Pallavas, Chalukyas of Badami, Rashtrakutas and Cholas. Bhakti Movement in South India: Shaiva Nayanars and Vaishnava Alwars.
		CO2	Arab Conquest of Sind, Ghaznavids and Ghoris, The Delhi Sultanate, the slave dynasty.
		CO3	Bhakti and Sufi Movements Prominent Bhakti and Sufi Saints their Preaching's - Impact on Society and Culture - Emergence of Composite Culture.
		CO4	Kakatiyas – Polity – Administration - Society and Economy - Literature and Religion – Art and Architecture – Yadavas – Hoysalas and Pandyas – their contribution to South Indian Culture
		CO5	Vijayanagara – A Brief survey of Political History – Polity - Administration - Society and Economy – Religion – Art and Architecture – Language and Literature - The Brief History of Bahamanis and their Contribution to the Deccan Culture
HIS 303	History of India (1526-1857 CE)	CO1	Mughal Dynasty, – Shershah Sur and His Reforms and Hindu-Muslim Relations – Emergence of Composite Culture – Education – Language and Literature – Art and Architecture - Disintegration of Mughal Empire.
		CO2	Rise of Regional Powers - Marathas – Shivaji , Sikhs. – Ranjit Singh – Rise of Princeley States – Hyderabad – Avad - Junagarh – Mysore – Kashmir
		CO3	Advent of European Powers - Portuguese, Dutch, English and French, Anglo-French Rivalry - Expansion and Consolidation of British Power – Wellesley's Subsidiary Alliance – Dalhousie's Doctrine of Lapse.
		CO4	Three Stages of Colonialism – Mercantilism - Free Trade Policies – Finance Capital - Land Revenue Settlements – Cornwallis and Permanent Revenue Settlement; Thomas Munroe and Ryotwari; Mahalwari System – Changes in the Agrarian Economy and Condition of Peasantry – Famines.
		CO5	Decline of Rural Cottage Industries and Urban Handicrafts - Growth of Railways, Roads, Communication – Modern Industries – Coal Mines, Textiles, Iron and Steel, etc. - Anti-Colonial Upsurge - 1857 Revolt – Nature, Causes and Results
HIS 404	History of India (1858-1964 CE)	CO1	Queen's Proclamation – Beginning of Colonial Rule – Introduction of Western Education – Role of Christian Missionaries – Press, Communication and Emergence of Middle Classes - Lytton and Rippon: Impact of their Policies.
		CO2	Socio-Religious Reform Movements – Brahma Samaj - Arya Samaj - Theosophical Society - Ramakrishna Mission -

			Aligarh Movement; Anti-Caste Movements - Jyotibha Phule - Narayana Guru - Periyar Ramaswamy Naicker and Dr. B.R. Ambedkar
		CO3	Factors for the Rise of Nationalism – Formation of Indian National Congress – Three Phases of Freedom Struggle: Moderate Phase, Extremist Phase and Gandhian Era - Non-Cooperation, Civil Disobedience and Quit Indian Movement; Indian National Army and Subhash Chandra Bose.
		CO4	Revolutionary Movement: Gadar Party – Bhagat Singh – Chandra Sekhar Azad and Others; Left-Wing Movement – Rise of Socialist and Communist Parties - Peasant and Workers Movements
		CO5	Emergence of Communal Politics and Mohd. Ali Jinnah – Prelude to Partition of India - Sardar Vallabhai Patel and Integration of Princely States into Indian Union – Republic of India – Jawaharlal Nehru and His Policies.
HIS 505	History of the Modern World (From 1453 CE to 1964 CE)	CO1	Geographical Discoveries, Renaissance and Reformation , Counter Reformation movements in Europe Rise of Colonialism - Mercantilism and Nation States in Europe – Spain – France – England – Russia – Austria – Italy and Prussia
		CO2	Age of Revolutions – Glorious Revolution (1688) - American Revolution (1776) - French Revolution (1789) – Napoleon – Wars – Reforms- Revolutions of 1830 and 1848 - Industrial Revolution.
		CO3	Rise of Capitalism – Impact on Asia and Africa – Colonization of Africa - Asia and Latin America - Entry of European Powers in China – Opium Wars – Revolution in China – Boxer Revolt - Sun-Yat-Sen – Mao's Communist Revolution - Meiji Restoration and Modernization of Japan-Unification Movements in Germany and Italy
		CO4	World between 1914-1945 Rivalry among colonial powers Imperialist Hegemony - Causes and consequences of first World War – World between the Wars - League of Nations - Russian Revolution – Causes and consequences. Fascism in Italy, Nazism in Germany, Militarism in Japan – Nationalist and Communist Movements in China - Role of Sun-YatSen and Mao-Tze-Tung.
		CO5	Causes and consequences of Second World War – UNO, Its Contribution to World Peace – Decolonization and National Liberation Movements in Asia, Latin America and Africa – NAM – its Origin – Aims Importance.
HIS 506	Tourism and Culture	CO1	Definition – Meaning, Nature and Scope of Tourism – Concepts: Who is a Tourist, Travellers, Visitor and Excursionist – definitions and differentiation – Types of Tourism: Religious Tourism, Eco Tourism, Rural Tourism, Health Tourism, Adventure Tourism, Historical Tourism, Cultural Tourism.

		CO2	Historical Dimensions of Tourism Travel and Tourism through the Ages: Early Travels, 'Renaissance' and 'Age of Grand Tours' – Emergence of Modern Tourism, Concept of 'Paid Holiday' – Understanding Tourism Motivations – Concept of Push and Pull Factors in Tourism.
		CO3	Infrastructure in Tourism: Tourist Transport – Forms & Types: Road-Rail-Sea-Air-Tour Operators – Travel Agency – Planning the Itinerary – Tourist Accommodation – Forms & Types.
		CO4	impact of Tourism – Socio-Cultural Impact – Ecological & Environmental Impact – Economic Impact – Multiplier Effect – Political Impact and Government Policies – Tourism as an Industry – Future of Tourism in India
		CO5	Development of Tourism in Telangana
HIS 607	History and Culture of Telangana (From earliest times to 2014 CE)	CO1	Sources – Pre-History of Telangana – Asmaka Janapada and the Culture of Ancient Telangana – Jainism and Buddhism – Brief Political Survey of Satavahanas – Ikshvakus, Vishnukundins – Medieval Telangana from Kakatiyas to Qutb Shahis – Popular Revolts – Sammakka-Sarakka, Sarvai Papanna – Society, Economy and Culture; Fairs, Festivals, Folk, Batukamma, Bonalu, Urs, Muharram, etc. Telangana Food, Festivals, Arts, Folk Songs, Symbols, Musical Instruments, Composite Culture.
		CO2	Foundation of Asaf Jahi Dynasty – A Brief Survey of The Political History of Asaf Jahis from 1724-1857 – Salarjungs Reforms and their Importance Mir Mahboob Ali Khan and Mir Osman Ali Khan – Modernization of Hyderabad under them – Growth of TRanspotation and Communication, Public Health, Industries and Osmania University – Public Health – Hospitals – Social, Cultural and Political Awakening in Telangana – Press, Journalism and Library Movements – Nizam Andhra Jana Sangham – Arya Samaj and Its Activities – Ittehadul Muslimin Party – Bhagya Reddy Varma and Dalit Movements.
		CO3	Political Developments in Hyderabad State 1900 to 1942 – The Andhra Maha Sabha – Hyderabad State Congress – Mulki-Non-Mulki Issue (1930) - Vandemataram Movement – Comrades Association, Student and Workers Organisations and Movements - Communist Party and Its Activities – The Role of Women in Hyderabad Freedom Movement.
		CO4	Anti-Nizam and Anti-Feudal Movements - Telangana Peasants Armed Struggle – Adivasis Revolt – Kumaram Bheem – Razakars and their Activities – Police Action - Formation of Popular Ministry under Burgula Rama Krishna Rao - Assertion of Mulki Identity and the City College Incident (1952) - Merger of Telangana and the Formation of Andhra Pradesh, (1956)

		CO5	Discrimination, Dissent and Protest - Violation of Gentlemen's Agreement - Agitation for Separate Telangana State: Formation of TPS – Role of Intellectuals, Students, Employees in 1969 Movement - Second Phase Movement for Separate Telangana – Formation of Various Associations – Telangana Aikya Vedika – Telangana Jana Sabha – Telangana Rashtra Samiti (2001) – Mass Mobilization – Sakala Janula Samme – Millennium March – Sagara Haram, Chalo Assembly – December 2009 Declaration and the Formation of Telangana State, June 2014.
HIS 608	Islamic History	CO1	The Scope of Islamic History – Geographical Conditions of Arabia – Pagan – Civilization and Islam – Political and Social Conditions before the Prophet at Mecca and Madina - Early Life of Prophet Muhammad – Meccan Period – Migration to Madina – The Holy Quran – The Battle of Badr –The Truce – Conquest of Mecca – Conditions of Arabia – Prophet Muhammad Social Reformer and Leader.
		CO2	The Era of Pious Khalifas – Abu-Bakr-Umar – Further Expansion – Osman-Ali – Their Achievements – The Struggle for Power between Syria and Al-Iraq and Hijaz – Administrative System under Khalifa - Causes for the Fall of Khalifas.
		CO3	The Umayyad Khalifah – Mua-Wiyah-Yazid-I Battle of Karbala – Marwan-I-Abdul Malik and His Achievements - Al-Walid-I, Suleman – Ibn-Ul-Azi-Hisan – His Relations with Byzantine – Conquests in East and West Development of Society and Growth of Fine Arts – Marwan-II and the Fall of Umayyads – Administrative System under Umayyads – Society under Umayyads.
		CO4	The Advent of Abbasids – Al-Saffah and Al-Mnsur Al-Mahddi – Revolt in Khurasan – Byzantine Raid – Al-Hadi – His Achievements – Haroon – Al-Rasheed – His Political and NonPolitical Achievements – Rise and Fall of Barmakids – Estimate of Haroon – Al-Rasheed's Character - Al-Amin – Civil War between – Al-Amin and Al-Mamun – Achievements of AlMamun – Later – Khalifas of Abbasid Dynasty – Al-Mutasm – War with the Byzantine Empire – Revolt of Tabaristan – The Buwaids – Azad-ud-Daula – The Seluqs – Malekshah - The Crusades – Causes – Course of Crusades – Imaduddin Zangi – Nuruddin – Mahmud – The Results of Crusades- The Abbasid State – Political and Military Systems – Judicial Reforms – Education – Growth of the Fine Arts – Socio-Economic Conditions – Art and Architecture under Abbasids – Growth of Scientific Spirit - Fall of Abbasid Dynasty.
		CO5	The Ummayads in Spain – Abdur-Rahman-Hisham-I – War with the Franks – Cultural Progress in Muslim Spain – The Fatimids of Egypt – Al-Mahdi – Al-Qaim – Al-Muizz Fall of Fatimids (1171 A.D.) – Administration and Society under Fatimids.

HIS 609	Ancient Civilizations	CO1	Beginnings of Ancient Civilizations – Features - Mesopotamian Civilization - Beginning and Expansion - Contacts with Other Civilizations - Nature of Polity – Socio-Economic and Religious Conditions - Evolution of Script - Art & Architecture.
		CO2	Egyptian Civilization - Origin and Spread – Polity - Society – Economy - Art and Architecture.
		CO3	Indus Valley Civilization – Salient Features – Decline - China - Nature and Extent of Civilization – Polity – Society - Economy – Religious Beliefs - Philosophy and Culture.
		CO4	Greek Civilization - Nature of Polity and Society - Agrarian Economy - Trade and Urbanization - Distinctive Features of Greek Civilization – Philosophy – Education - Art and Architecture - Roman Civilization - Origin and Spread of Roman Empire – Features - Polity and Roman Republic – Slavery - Social Structure - Economic Organization - Religious System and Cultural Contribution – Decline.

Dept. of Economics			
ECO 101	Micro Economics	CO1	Understands the Economic behavior and methodology of micro economics.
		CO2	Analyses the Consumer behavior and his preferences based on his utility.
		CO3	Understand Market Demand and factors affecting price and demand.
		CO4	Understands objectives of a business firm and Nature of Production.
		CO5	Analysis Of Business Firm, Profit And Pricing Strategies
ECO 202	Micro Economics	CO1	Understands the Revenue and Cost of a firm and its equilibrium.
		CO2	Know the types of Markets and its price determination under different time periods.
		CO3	Understands the factors of production and its characteristics and pricing
		CO4	Understands the different theories of Pricing of factors of production
		CO5	Inflation & Trade Cycles
ECO 303	Statistics For Economics	CO1	Introduction to Statistics
		CO2	Measures of Central Tendency and Dispersion
		CO3	Correlation and Regression
		CO4	Index Numbers
		CO5	Analysis of Time Series
ECO 404	Indian Economy	CO1	Structure of the Indian Economy
		CO2	Indian Agriculture.
		CO3	Indian Industry and Services
		CO4	NIIT AAYOG

		CO5	Service Sector, Economic Reforms.
ECO 505	Telangana Economy	CO1	Telangana Economy
		CO2	Gross State Domestic Product, Poverty and Unemployment
		CO3	Agriculture Sector
		CO4	Industrial Sector and Service Sector
ECO 506	Agricultural Economics	CO1	Nature and scope of agricultural economics, Factors affecting agricultural development, technological, institutional and general. Interdependence between agriculture and industry..
		CO2	Concept of production function: input and product relationship in farm production.
		CO3	Growth and productivity trends in Indian agriculture. Agrarian reforms and their role in economic development.
		CO4	Systems of farming, farm size and productivity relationship in Indian Agriculture. New agriculture strategy and Green revolution and its impact.
		CO5	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
ECO 607	Public Economics	CO1	Introduction of Public Economics
		CO2	Public Expenditure
		CO3	Taxation & Public Debt
		CO4	Fiscal Policy & Federal Finance
		CO5	Budget
ECO 608	Economics of Environment	CO1	Theory and Concept of Environmental Economics
		CO2	Environment and Economics.
		CO3	Environmental Problems
		CO4	Environmental Pollution Control
		CO5	Policy measures.
ECO 609	International Economics	CO1	Theories of International Trade
		CO2	Trade and Growth
		CO3	Tariff and Non-Tariff Barriers to Trade
		CO4	Balance of Payments
		CO5	Internal Factor Movements
ECO 610	Development Economics	CO1	Economic Development and Growth
		CO2	Factors in Economic Development
		CO3	Theories of Economic Development
		CO4	Theories of UnderDevelopment
ECO 611	Industrial Economics	CO1	Meaning and classification of Industries
		CO2	Market Structure and Market Performance
		CO3	Industrial Pattern under Five Year Plan
		CO4	Industrial Finance
ECO 612	Financial	CO1	Introduction to Indian Financial System

	Economics	CO2	Money and Capital Markets
		CO3	Foreign Exchange Market
		CO4	Financial Derivatives

Department of Political Science			
POL 101	Understanding Political Theory	CO1	Perspectives in the discipline of Political Theory and it's importance
		CO2	Origin of the state and theories and Sovereign State
		CO3	Liberal, Marxist, Feminist views on Liberty, Equality and Justice
		CO4	Political Ideologies and their importance for the construction of social system and state
		CO5	Organs of Government – their composition, Powers and functions
POL 202	Western Political Thought	CO1	Greek Political Thought - Sophists to Aristotle
		CO2	Medieval and Early Modern Thought - Thomas Aquinas and Machiavelli
		CO3	Social Contractualists - Thomas Hobbes, John Locke and J. J. Rousseau Theory's
		CO4	Utilitarian Thought - Jeremy Bentham and J. S. Mill Thoughts
		CO5	Philosophy of Dialectics - Hegal and Karl Marx
POL 303	Indian Political Thought	CO1	State and Society in Ancient India - Manu, Buddha and Koutilya Theory's
		CO2	Medieval Indian Political Thought Basava and Ziauddin Barani Thoughts
		CO3	Renaissance Thoughts in India Raja Ram Mohan Roy and Jyothi Rao Phule Contribution
		CO4	Reformist Thought in India - Gandhi and Ambedkar Thoughts
		CO5	Socialist Thoughts in India - M.N. Roy, Jawaharlal Nehru and R.M. Lohia Views
POL 404	Constitution and Politics of India	CO1	National Movement and Constitutional Development in India – upto Indian Independence Act - 1947
		CO2	Powers and Functions of Executive, Legislature and Judiciary in Union and State Governments
		CO3	Observed the constitutional relations between Centre and State
		CO4	Political Parties in India - National , Regional Parties and Election Commission
		CO5	Political Issues – Gender, Caste, Minority and Secularism
POL 505	International Relations	CO1	Meaning ,scope importance, approach of International Relations and Sovereign State System
		CO2	First World War and Second World War and Neo-colonialism

		CO3	Cold War - Overview
		CO4	India's Foreign Policy and Non- Alignment
		CO5	India's Relations with USA, China, Pakistan, Sri Lanka and Nepal
POL 506	Government and Politics in Telangana	CO1	Historical Background of Telangana upto 1948
		CO2	States Reorganization in India – Formation of Andhra Pradesh State
		CO3	Separate Telangana State Movement and Issues
		CO4	Politics of Formation of Telangana
		CO5	Formation of Telangana and Electoral Politics
POL 607	Global Politics	CO1	Power – Overview
		CO2	Observe Bipolarity, Multipolarity and Unipolarity
		CO3	Discus Human Rights, Terrorism, Environmental Issues
		CO4	International Economic Organisations - World Bank and IMF, UNCTAD; North – South Dialogue and South – South Co- operations; WTO
		CO5	International Security – Issues of Arms
POL 608	Contemporary Social Movements	CO1	Introduction to Social Movements and Rise of Social Movements Issues in Social Movements
		CO2	Social Reform Movements in India : Anti- Brahmin Movement: Ramaswamy Naicker, Naryana Guru, Backward Class movements and Women's Movement
		CO3	Agrarian Movements: Bharat Kisan Union,
			Shetkari Sanghatana, Karnataka Rajya Ryta Sangha
		CO4	Environmental Movements: Chipko Movement
			Narmada Bacho Andholan
		CO5	Assertion Movements: Adivasi, Dalit and
			Naxalite Movements
POL 609	Contemporary Political Theory/Project Work	CO1	Liberal Theory - Isaiah Berlin, Hannah Arendt Theory's
		CO2	Neo Marxist Theory's - Antonio Gramsci and Sameer Amin Theory's
		CO3	Feminist Theory's - Simone de Beauvoir and Betty Friedan Theory's
		CO4	Feminist Theory's Vandana Shiva and
			Cynthia Enloe Theory's