

Program Course Outcome

B.Com Programme

Outcomes

- PO1 To build a strong foundation of knowledge in various fields of commerce
- PO2 To develop the skill of applying methods & techniques used in commerce
- PO3 To develop an attitude for working effectively and efficiently in corporate world
- PO4 To blend knowledge, skill and positive attitude that will sustain an innovative and creativity atmosphere within the students
- PO5 To develop students for becoming influential entrepreneur's of tomorrow

Course Outcomes of Bachelor of Commerce (B.Com)

Semester I

Paper-1 Financial Accounting-I

- CO1 Conceptually define accounting and bookkeeping
- CO2 Identify the accounting rules required for business enterprises
- CO3 Apply the accounting rules in determining financial results, prepare financial statement compare the specificity of different accounts within the accounting policies
- CO4 Can able to prepare trading, profit and loss account and balance sheet with adjustments

Paper-2 Business Organization

- CO1 To encourage students who will become entrepreneur's for social responsibility of business towards various sectors.
- CO2 To understand the concept of Company, Classification, advantage its role in economy.
- CO3 To understand the nature and types of business organization
- CO4 To know about the usage of equipments and computers for e- business

Paper-3 Company Law

- CO1 To make students aware about the fundamentals of company Law-2013
- CO2 Gain knowledge on the various laws pertaining to commercial activities

CO3 To understand the working of share capital and formation of Companies

CO4 To know the entire work culture of management of a company

Paper-4 Business Economics

CO1 To know about the basics of business economics

CO2 To understand the concept of Laws of Demand and Supply

CO3 To apply the Theory of Production

CO4 To know the concept of Theory of Cost and Revenue

Semester II

Paper-1 Statistics and Business Mathematics:

CO1 To make students aware about the different types of series

CO2 To make students aware about tabulation & classification of data

CO3 Students will be made aware about the dispersion and skewness series

CO4 Students will be equipped with calculation of ratios, percentages, simple and compound interest

Paper-2 Business Management:

CO1 To enable the students to know the concept of business management.

CO2 To understand the different techniques of planning and decision making

CO3 To understand the concept and application of Delegation of Authority and Co-ordination & Controlling.

CO4 To make students aware about the Recent trends in management.

Paper-3 Secretarial Practice:

CO1 To understand the provisions of company act and secretarial work relating to companies act

CO2 To Gain knowledge on the role of company secretary in the regular business activities of company.

CO3 To know legal provision on the board of directors, their qualifications and powers

CO4 To understand the concept of e-governance

Paper-4 Business Economics – II:

CO1 To study the types of markets and their features

CO2 To study the Perfect & Imperfect Competition Markets.

CO3 To study the various Theories of Distribution

CO4 To make them aware about fluctuation in Trade Cycles & National Income.

SEMESTER - III

Paper-1 Financial Accounting - II:

- CO1** To make them understand concept of consignment accounting
- CO2** To understand the concept and application Branch Accounting (Excluding Foreign Branch)
- CO3** To know the concept of Joint Stock Companies and their Capital Structure.
- CO4** To prepare the Final Accounts of Joint Stock Companies with adjustment.

Paper-2 Business Communication & Management:

- CO1** To understand the various modes and forms of communication in business
- CO2** To understand and know the modern trend of communication applicable to business with customers.
- CO3** To make them aware about the use of Technologies for business communication
- CO4** To learn the basic concepts of MS-office for business communication

Paper-3 Business Law:

- CO1** To make students aware about different business Laws and their necessities relating to Business.
- CO2** To understand the Essentials in law of contract and agreements
- CO3** To develop in the student an understanding of the free enterprise system and the legal safeguards of the same.
- CO4** To make students aware about Laws relating to Consumers, environment and Information Technology

Paper-4 MONETARY ECONOMICS-I:

- CO1** To know the concept, types and evolution of Money
- CO2** To understand the concept of Inflation & Deflation
- CO3** To study the Money Market Operations & Policies
- CO4** To know the concept of Public Finance

SEMESTER - IV

Paper-1 Financial Accounting - III:

- CO1** To makes students aware about the financial statements of Banking Companies
- CO2** makes students aware about the financial statements of General Insurance Companies
- CO3** To understand the concept and methods of valuing goodwill
- CO4** To gain the knowledge on the accounting procedures followed during the liquidation of companies.

Paper-2 Skill Development:

- CO1** To assist in developing their personality
- CO2** To develop soft skills among the learners enabling them to communicate effectively and efficiently
- CO3** To help the students in developing their communication skills through effective use of English
- CO4** To develop entrepreneurship skills amongst the students for their growth

Paper-3 Income Tax:

- CO1** To acquire knowledge of basic principles of Income Tax law-1961
- CO2** To acquire knowledge of Computation of Income from Salary
- CO3** To acquire knowledge of Computation of Income from property
- CO4** To gain the knowledge of Computation of Income from other sources and other deductions

Paper-4 MONETARY ECONOMICS-II:

- CO1** To make students aware about basic concept of commercial banking
- CO2** To make students aware about concept of e-banking and core banking
- CO3** To help students understand banks, customers relationship and services
- CO4** To gain the knowledge about role and functions of central bank

Semester V

Financial Accounting

CO1: Understand the concept of Amalgamation and absorption of companies and accounting procedure followed for this

CO2 : Understand the concept of Internal and External reconstruction of companies and its procedure

CO3 : To acquire knowledge of Double Accounting System and its application

CO4 : To get the knowledge, how valuation of share is done?

Cost Accounting

CO1 : To know the difference between Cost accounting and Financial Accounting, and learn how the cost sheet is arrived

CO2 : To understand the need of reconciliation of profit shown by Financial and cost accounting and to learn the methods of reconciliation

CO3: Write up the process costing by understanding the concept of normal and abnormal loss

CO4 : To make students aware about contract costing with elements and nature of contract

Management Process

CO1 : Understand the Concept ,objective and importance and functions of Management and Administration

CO2 : To understand the need of managerial skill required for manager

CO3 : To acquaint with managerial style and significance of professional manager in present scenario

CO4 : To understand importance of motivation in an organization

Indian Economics

CO1 : Understand the objectives of economic Planning and strategy of India's development plans.

CO2 : To get the knowledge of economic growth and economic development of India

CO3 : To acquire the causes of population explosion and its relation with unemployment

CO4 : To understand meaning and role of public revenue and public expenditure in Indian

Business finance

CO1 : To understand meaning and sources of Business Finance

CO2 : To understand the theoretical approach of Project finance and its appraisal

CO3 : Calculate the assignment of working capital requirement

CO4 : Understand the difference between debtors management and creditors management

Computerized Accounting

CO1 : To know the difference between computerized and manual accounting

CO2 : To learn Tally software and its various features

CO3 : To learn the practical approach of Tally

CO4 : To learn Inventory management in Tally and its reporting

Semester VI

Financial Accounting

CO1: To know the concept of Holding Company, Subsidiary Company and acquire the knowledge of Consolidated Balance -sheet.

CO2 : Understand the concept of Insurance claim for loss of stock

CO3 : Understand what is Investment Accounting and to know valuation of securities

CO4 : Elucidate the features and computation of Profit Prior to Incorporation

Management Accounting

CO1 : To compare difference between cost accounting and management accounting

CO2 : To understand concept of Budget and budgetary control

CO3 : To learn the application and inferences of various ratios.

CO4 : Students will able to know difference between Funds flow statement and Balance sheet

Advanced Statistics

CO1 : Learn to calculate coefficient of correlation in given frequency

CO2 : Learn to evaluate regression analysis, for a bivariate frequency table

CO3 : Study uses of Index number with time reversal test

CO4 : Learn to calculate simple problems on trend, short term variation & irregular variation

Indian Economy

CO1 : To Understand the nature, role of agriculture in Indian economy

CO2 : Analyse and understand Indian Industry and industrial policy 1991

CO3 : Understand the contribution of service sector to India's GDP

CO4 : To get overall idea of India's International Trade

Human Resource Management

CO1 : Understand the definition, objectives, function, scope, importance of human resource Management

CO2 : Understand Recruitment, selection and Training process

CO3 : To enable the students to know the labour welfare policy and its impact

CO4 : To understand the concept of Human resource planning and its accounting

Business Finance

CO1: To know significance of Financial market in India

CO 2 : To understand the concept of primary market and secondary market in stock exchange

CO 3 : To gain knowledge on dividend policy

CO 4 : To acquire knowledge of Cash flow statement and its provision in Accounting

Standard 3.

Department of Economics

COURSE OUTCOMES (UG)

B. A. I (Micro economics)

1. Analyze the Traditional and Modern Definitions of economics.
2. Understand the various methodologies in economics.
3. Analyze and evaluate the performance of firms under different market structures.
4. Elaborate the working of input markets.

B. A. II (Macro Economics)

1. Analyze and evaluate the forces that affect the aggregate level of economic activity.
2. Analyze the impact of fiscal and monetary policy in the economy.
3. Evaluate the determinants of international trade and financial flows.
4. Develop an in-depth understanding of the new Banking system.
5. Acquire knowledge of Health Economics.

B. A. III (Indian Economics)

1. Explain the Basic features of Indian Economy.
2. Understand the concept of poverty and inequality
3. Annotate the Types of Tax and the Indian Tax structure.
4. Acquire problem solving skills and develop a logical way of dealing with various economic issues.

Programmers Specific Outcomes (PSO'S)

1. Students shall be able to develop an awareness about career choices.
2. Students will be able to demonstrate quantitative reasoning skills
3. Students will be able to analyze human behavior.
4. Students will get knowledge about the benefits of saving.

Department of Economics
M. A.

COURSE OUTCOMES: (PG)

1. To analyze the Behavior Pattern of the Firms.
2. To grasp knowledge regarding Different Pricing Strategy
3. To be aware about Price determination of firms
4. To have better awareness
6. Help the students to apply knowledge and analytical skills.
7. Students will get an idea of the range of methodology.

Programme Specific Outcomes:

1. Students will be able to improve their economic vocabulary.
2. Students will be able to demonstrate quantitative reasoning skills
3. Student develops an awareness of career choices & the option higher studies
4. Students will get information about the genesis of Economics and its modern scenario.
5. Making awareness about selfemployment through various local business

Department of English

Programme, Specific Programme and Course Outcomes 2019- 20

Program Outcomes:

With the given programme contents, the students will be able to:

1. Comprehend the theories and practices of language use.
2. Demonstrate advanced critical thinking skills along with literacy.
3. Communicate in a variety of contexts and genres.
4. Equip oneself with a wide range of writing and speaking skills.
5. Inculcate an ability to use, analyze, and learn communication technologies.
6. Develop communication abilities with diverse audiences.

Programme specific Outcomes (PSO's)

1. Availing job opportunities in translation, transformation and media.
2. Developing a critical attitude about literary studies
3. Imbuing literary research attitude.

Course Outcomes:

BA I (English)

1. To understand the interrelationship between literature and society.
2. To explain the nature of language and literature.
3. To obtain the skill of literary criticism.
4. To imbue the skills of essay writing.
5. To be able to illustrate the nature of literary forms like one-act-play, travelogue and short story.

BA II (English)

1. To relate with the Old English Language and literature.
2. To develop an inclination towards contemporary literary works.
3. To acquire the skill of translation
4. To explicate the need and significance of editing.

BA III (English)

1. To get acquainted with oriental poetry.
2. To develop an understanding about the nature and features of poetry.
3. To acquire the skill of critical appreciation of a poem.
4. To device poetic devices and their usages.

English Literature

Programme outcome

- To enhance the reading of poetry, drama and classics in all its contours
- To create awareness of poetry/drama and classics as a part of modern life • To help students learn and practice critical thinking — develop problem solving/ decision making
- To put forward innovative and creative ideas with trained activities
- To help realise cultural differences and accept them as they are
- To understand the importance of Intercultural learning To assist students in the development of intellectual flexibility, creativity, and cultural

Specific Programme Outcome

- Students will be familiar with representative literary texts within a given historical, geographical, and cultural context.
- Students will be able to apply critical and theoretical approaches to the reading and analysis of literary and cultural texts in multiple genres.
- Students will be able to identify, analyse, interpret and describe the critical ideas, values, and themes.
- Students will learn to put forth ideas, values, and themes which inform and impact culture and society, both now and in the past.
- Students should be able to write analytically using language competence
- Students will be familiar the different variety of literatures in all forms available
- Students will be able to imbibe ethical, moral, national and cultural values in an academic context.

MA (English)

Specific Course Outcome

- During the two years Post Graduation Course in English, the students studied various genres of English Literature.
- They will study Indian English Literature as well.
- They will become familiar with miscellaneous approaches such as Post Colonialism, Feminism etc.
- They will study the historical development of literature , miscellaneous movements in poetry, types of drama, etc.
- They will become aware of the Indian, American, African and other world literature in English as well.
- They will learn to explain the text and to express their views in detail on literary topics.
- They will also learn the development of language and language teaching.
- To introduce England from the late Fourteenth to the early Seventeenth Century with its social, political, religious and economic conditions.
- To** trace the evolution of English Parliament from Plantagenet period to endeavoring of blending the spirit of the Renaissance and the Reformation.
- To give an account of the development of poetry and its different forms.

Course Outcomes

Students will be able to understand

- e changes that took place taking English Literature on the path of modernization Different forms of poetry.
- The reasons behind the undercurrents of upheavals and disturbances prevalent in working classes leading to generation of a Progressive Spirit.
- The students will come to know about the beginning of English drama and what role did the initial contributors play to give this well-developed English theatre.
- Students will acquire knowledge about the different Genres of drama during this era.
- The learners will be able to critically examine the form of drama adopted by the predecessors who provided a solid foundation to great Shakespearean dramas and the dramatists who followed in the Jacobean period.

JEEVAN VIKAS MAHAVIDYALAYA, DEVGRAM

DEPARTMENT OF HISTORY

Programme Outcome & Specific Programme Outcome

Bachelor of Arts (B.A.) History

2019-20

Programme Outcome

- * Students are able to understand the genesis of history and development of history writing indifferent country as well as in India.
- * Sources of ancient India, Civilizations like Indus and Aryan, political and religious changes in 6th century B.C., Mauryan Empire etc are studied.
- * Students will distinguish between primary and secondary sources and identify and evaluate evidence.
- * Students will demonstrate in discussion and written work their understanding of different peoples and cultures in past environments and of how those cultures changed over the course of the centuries.
- * Students will demonstrate in written work and class discussions the ability to recognize and articulate the diversity of human experience, including ethnicity, race, language, gender, as well as political, economic, social, and cultural structures over time and space.

Programme Specific Outcome

- * Archaeologist: Archaeological Survey of India with private Firms related to archaeology.
- * Historian: With so much debate over the authenticity of historical books, there is ever increasing demand for historians.
- * Public Service: For History graduate, the option of public service like UPSC,APSC are always open.
- * Teacher: After B.A. in history one can always find employment as a history Teacher.
- * Writer/Subject Expert: Nowadays a lot of publishing houses seek subject matter experts for publication of school textbook or supplementary reading materials.
- * Travel and tourism expert: With an extensive knowledge of history and historical monuments, history graduates can work as a travel expert for tourist spot of historical importance

Department of Marathi

Program Outcomes:

1. Developing a comprehensive understanding of the theories and practice of language use.
2. Demonstrating advanced critical thinking skill along with literacy.
3. Communicating in a variety of contexts and genres.
4. Equipping the students with a wide range of writing and speaking skills.
5. Students will have the ability to use, analyze, and learn communication technologies.
6. Students will develop communication abilities with diverse audiences.

Course Outcomes:

B.A I (Marathi)

1. To understand the interrelationship between literature and society.
2. The students will be able to explain the nature of language and literature.
3. To obtain the skill of literary criticism.
4. To imbue the skills of essay writing.
5. To illustrate the nature of literary forms like one-act-play, travelogue and short story.

B.A.II (Marathi)

1. To familiarize students with the medieval Marathi language and literature.
2. To develop students' interest in contemporary literary works.
3. To acquire the skill of translation.
4. To understand the need and significance of editing.

B.A.III (Poetry):

1. The students will be able to get acquainted with oriental poetry.
2. To develop an understanding about the nature and features of poetry.
3. To inculcate the skill of critical appreciation of a poem.
4. The students shall develop the poetic devices and their usages.

Programmes Specific Outcomes (PSO's)

B.A. (MARATHI)

1. Creating an interest in literature.
2. Availing new job opportunities in translation, transformation and media.
3. Developing language.
4. Developing a critical attitude about literary studies.
5. Imbuing literary research attitude.

Department of Music

Course Outcomes: With the given course contents the students will be able to:

B.A. I (Music)

1. Acquire knowledge of Layas (Tempo).
2. Get the basic and complete knowledge of Swaras (Notes) and their position in octaves.
3. Use the Swaras (Notes) to synthesize different Alankaars.
4. Use the Swaras (Notes) to compose different Khyalas (small songs).
5. Acquire basic practical and theoretical knowledge of Classical Music.
6. Get to know about the instruments used in Classical Music.

B.A. II (Music)

1. Use the various Thaatas to synthesize different Alankaars.
2. Gather knowledge of various Layas (Tempo) like Dugun, Chaugun of Taalas (Rhythm).
3. Discern various Music Maestros and their lives.
4. The students shall learn about various Music instruments and their components.
5. The student will be able to classify the Raagas according to their Swaras (Notes).
6. With the given knowledge the student shall learn Folk Music and Light Music to understand & Preserve the same.

B.A. III (Music)

1. To integrate knowledge of different Gharanas and the manner in which the songs are sung in different Gharanas in Classical Music.
2. To develop a competency of composing new songs.
3. To get the knowledge of various Granths and their authors.
4. To develop an efficiency to classify Raagas based on different criterias.
5. To encompass knowledge of various Angas like Kannada Anga, Malhar Anga, NatAnga etc.

Programme Specific Outcomes:

1. Develop the technical skills of musical performance with harmony.
2. Study the theoretical details of ragas and talas with their practical performance.
3. Study the contribution of the renowned musicians.
4. Learn to write the practical compositions according to the Notation system.
5. Study about the theoretical aspects of the prescribed ragas.

DEPARTMENT OF POLITICAL SCIENCE
Programme Outcome & Specific Programme Outcome
2019-20

Programme Outcome

- * Write clearly and with purpose on issues of international and domestic politics and public policy.
- * Use electronic and traditional library resources to research key local, state, national and international policy issues and present results;
- * Discuss the major theories and concepts of political science and its subfields; and
- * Demonstrate competency with basic tools underlying modern social science research including competency in statistics and qualitative analysis
- * Deliver thoughtful and well articulated presentations of research findings.

Programme Specific Outcome

- * Understand the contribution of the main traditions of western political thinkers to political thought.
- * Understand the processes and dynamics of Indian government and politics. It also familiarize with the vital contemporary emerging issues of centre-state relation, political parties, emergence of new leadership at different levels, demand for autonomy movement, ethnic conflicts etc.
- * Understand the basic concept and ideological orientations of political science discipline.
- * Understand the contribution of the main traditions of Indian Political Thought.
- * Acquaint with the basics of International Law and the new trends in the realm of International law.
- * Understand the basic concept and issues concerning human rights and challenges.

JEEVAN VIKASMAHAVIDYALAYA, DEVGRAM

DEPARTMENT OF POLITICAL SCIENCE

2019-20

Programme Outcome

* Students will be familiarised with the different dimensions and the contemporary relevance of different concepts and theories, which would be applied in studying other papers.

* Students will be shaped as citizens who are aware of the ideals and philosophies of the Indian Constitution, Constitutional rights and duties, governmental institutions, centre - state relations and electoral politics in India. Students will also be made conscious of the social, cultural, economic and political environment that affects politics in India, at the national as well as regional level. □ A clear understanding of evidence collected from historical sources

* The expected outcome of the paper is to familiarise students with the workings and functioning of International Organisations, especially the United Nations and enable them to understand the different issues taken up by the UN.

* Students will be shaped as citizens who are aware of the ideals and philosophies of the Indian Constitution, Constitutional rights and duties, governmental institutions, centre - state relations and electoral politics in India. Students will also be made conscious of the social, cultural, economic and political environment that affects politics in India, at the national as well as regional level.

Programme Specific Outcome

* Acquaint with the diverse political systems especially the developed countries including China and Switzerland.

* Sensitise with the sensitive peripheral state of India with special reference to Northeast India.

- * Familiarise with the problems and prospects of rural development of India.
- * Understand the cultural, social, political, economic and constitutional environment as a historical perspective of Indian Administration.
- * An understanding the evolution, development and trends of India's foreign policy

Department of Sociology
2019-20

PROGRAM OUTCOMES

Program Outcome of Bachelor of Arts (B.A.)

Student seeking admission for B.A. programme are expected to imbue with following quality which helps them in their future life to achieve the expected goals.

1. Realization and adaptation of human values and develop a sense of social service.
2. Imbibe qualities and responsibilities of a dutiful citizen.
3. Understand the discipline of sociology and the sociological perspective, and the contribution to our understanding of social reality.
4. Annotate how sociology differs from and is similar to other social sciences.
5. Apply the sociological imagination and sociological concepts and principles in one's own life. and participate actively in civic affairs.
6. Understand the role of theory in sociology, define theory, describe and illustrate its role in building sociological knowledge.
7. Analyse and demonstrate how theories reflect the historical and social contexts of the times and cultures in which they were developed.

B.A. SOCIOLOGY

Program Specific Outcomes:

1. Acquaintance with social transactions, social relations, social formations, social control, social values and culture.
2. Knowing the significance of social institutions, caste system, religion, nationalism, integrity, equality and justice.
3. Acquiring knowledge of the works of social reformers all over the nation.
4. Ability to follow a new stream of thoughts and theories of social thinkers.
5. Getting the deep knowledge about various social groups like tribal communities, women bulk etc.
6. Inculcate the skill to deal with research in sociology.

Course outcomes B.A. part-I, Semester I&II

Paper -I: - Introduction to sociology & Paper No-II:-Principles of Sociology

1. Comprehend the basic concept of Sociology, subject matter & importance of Sociology and origin and development of sociology.

2. Acquiring knowledge of human Society and Sociology.

B.A. Part-II, Semester III & IV

Paper-III: Foundation of Sociological Thought

1. Acquaintance with the sociological thought of the Pioneers of Sociology.
2. Creating and awareness of the perennial of structure versus agency.

Paper- IV Indian Sociological Tradition

1. Attributing the diversification in Indian society through the different ideologies given by various Indian Sociologists.
2. Sensitization of contemporary Indian issues.

B. A. part - III.

Sem. V: Indian society : the Structural Issues

1. Getting acquainted with the structure and changing nature of Indian society
2. Understanding various segments and unity of the Indian society
3. Discussing a brief outline of the making of the Indian Society

Paper No-VI: - Current Social Problems in India

1. Analysing major Social Problems and challenges before the problem of the Indian society.
 2. Developing an awareness of Contemporary Social Problems in India
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Department of Botany

Session 2019-2020

Bachelor of Science

Course Outcomes

(UG)

B.Sc. Semester

Paper I

Virus

- Learned about the general characteristics features of virus.
- Students able to understand about the structure and nature of virus.
- Students came to know about structure of TMV, Structure and multiplication of T4 – Bacteriophage.
- Students came to know about economic importance of virus.

Bacteria

- Students learned about the cell structure of bacteria.
- Students got idea about the type of reproduction in bacteria.
- Students came to know about economic importance in bacteria.

Cyanobacteria

- Students learned about the ultra cell structure and reproduction in cyanobacteria group.
- Students came to know about characteristics features of cyanobacteria.
- Students came to know about economic importance of cyanobacteria.
- They studied about the *Nostoc*, member of cyanobacteria.

Algae

- Students learned about the general characteristics feature of Algae.
- Students learned Classification of algae given by Fritsch 1954.
- Students learned about the life history of *Oedogonium* and *Chara*.
- Students learned about the life history *Vaucheria* and *Ectocarpus*.
- Students came to know about economic importance of Algae.

Paper II

Fungi

- Students learned about general characteristics of Fungi.
- Students learned about classification of fungi given by Alexopoulos 1996
- Students came to know about economic importance of fungi.
- Students learned about the life history *Albugo* and *Mucor*.

- Students learned about the life history of *Puccinia* and *Cercospora*.

Lichens

- Students learned about the different types of lichens.
- Students came to know about reproduction in lichens.
- Student came to know about economic importance of lichens.

Plant Pathology

- Students learned about different types of diseases occurring in plants.
- Students learned about the host and pathogen interaction.
- Students came to know about how to identify the symptoms of a disease on host.
- Students learned about disease like leaf curl of papaya, citrus canker and red rot of sugarcane.

Bryophyta

- Students learned about the classification of Bryophyta given by Proskauer 1957.
- Students learned about general characters of Hepaticopsida, Anthocerotopsida and Bryopsida.
- Students came to know about economic importance of Bryophyta.
- Students learned about alteration of generation of Bryophyta.
- Students learned about life history of *Riccia Anthoceros* and *Funaria*.

B.Sc. Semester

II Paper I

Pteridophyta

- Students learned classification of Pteridophytes given by Smith 1952.
- Students learned about general characters of Psilopsida, Lycopsida, Sphenopsida and Pteropsida.
- Students came to know about economic importance of Pteridophytes.
- Students learned about alteration of generation in pteridophytes.
- Students learned about life history of *Rhynia* and *Selaginella*.
- Students learned about life history of *Equisetum*.
- Students learned about the concept of Apospory, Apogamy, Heterospory and seed habit in Pteridophytes.
- Students got idea about stellar system in pteridophytes.

Gymnosperms

- Students learned about classification of Gymnosperm given by Stewart 1982.
- Students learned about general characters of Gymnosperms.
- Students came to know about economic importance of Gymnosperms.
- Students learned about alteration of generation in Gymnosperms.
- Students learned about the life cycle of *Cycas*.

Paper II

Palaeobotany

- Learned about Geological time scale.
- Learned about fossilization replacement theory and infiltration theory.
- Learned about types of fossil Impression, Compression and Petrification.
- Gain the knowledge about fossil plants *Glossopteris* (Leaf, Scutum).

Root morphology

- Learned about different types of roots.
- Learned about root modifications for storage.
- Learned about respiration and reproduction.

Stem morphology

- Learned about different aspects of stem like shape, texture, nature, branching patterns of stem.
- Learned about modifications in stem

Leaf Morphology

- Learned about different types of leaves.
- Learned about different aspects of leaf like Phyllotaxy and venation.
- Learned about modifications of leaf.

Inflorescence

- Learned about different types of inflorescence in plants.

Flower

- Learned about the flower structure and different whorls in the flower.
- Learned about different aspects of flower parts calyx, corolla, Androecium and Gynoecium

Fruit

- Gain the Knowledge about different types of fruit.
- Learned about simple, aggregate and composite type of fruits.

B.Sc. Semester

III Paper I

Angiosperms

- Learned about origin of angiosperms, Phylogeny of angiosperm.
- Learned about Homology, Monophyly, Polyphyly and clads.
- Learned about fossil angiosperms *Saharianthus* flower.

- Learned about angiosperm taxonomy and came to know about the concepts of Floras, Herbarium, Keys, Holotype, Lectotype, Neotype.
- Learned about system of classification of angiosperm given by Bentham & Hooker, Engler & Prantl along with merits and demerits
- Learned about modern trends in taxonomy including cytotaxonomy, Phytochemistry and taxometrics to taxonomy.

Families

- Learned about different dicot and monocot families in plants.

Paper II

Structure of plant cell

- Learned about the detailed structure of plant cell
- Gained the knowledge about ultrastructure and function of cell wall, cell membrane, Nucleus and endoplasmic reticulum.
- Gained the knowledge about ultrastructure and functions of Golgi complex, Vacuoles, Ribosomes, Mitochondria and Chloroplast.

Chromosome

- Learned about morphology of chromosome.
- Learned about molecular organization of chromosome.
- Gained knowledge about sex chromosomes in plants.
- Gained knowledge about cell division in plants, Mitosis and meiosis and their significance.

Plant Breeding

- Came to know about plant breeding and objectives in plant breeding.
- Learned about methods in plant breeding
- Learned about the concept of hybridization and heterosis.

Biostatistics

- Learned about concepts and to calculate the mean, mode, median standard deviation, standard error and Student's t test.

Evolution

- Learned about the origin of life and Miller's theory.

B.Sc. Semester

Paper I

Meristems

- Gained Knowledge about meristems and their types based on origin and position.
- Learned about permanent tissue and their functions.
- Learned about type of simple tissue and complex tissue.
- Learned about Apical meristem in root and shoot.

Primary growth

- Learned about primary structure of root in dicot and monocot plants.
- Learned about primary structure of stem in dicot and monocot plants.
- Learned about types of vascular bundles in dicots and monocots.
- Came to know about cambium.

Secondary growth

- Came to know about the periderm, growth ring, sap wood and heart wood.
- Learned about secondary growth in dicot and compared the anomalous secondary growth between *Bignonia* and *Dracena* stem.
- Learned about anatomy of dicot and monocot leaf.
- Came to know about the concepts of Plant senescence and abscission of leaves.

Embryology of angiosperms

- Came to know about pollination types and adaptation of plants for particular pollination, also learned its significance.
- Learned about the structure of anther, process of microsporogenesis and male gametophyte.
- Learned about different types of ovules in angiosperms, also came to know about the development of female gametophyte and megasporogenesis.
- Gained knowledge about fertilization in plants, about double fertilization and triple fusion in angiosperms.
- Gained knowledge about the endosperm and its types.
- Learned about the structure of dicot and monocot embryo.

Paper II

Mendelism

- Learned about laws of inheritance given by Mendel.
- Gained knowledge about interaction of genes and their patterns.

Linkage

- Came to know about concepts of linkage and its theories and types of linkage.
- Got about significance of linkage.
- Learned about crossing over, its theories and significance.

Chromosomal aberrations

- Learned about variation in chromosome number and their significance.
- Learned about structural changes in chromosomes and their significance.

Structure of DNA

- Learned about the Watson and Crick model of DNA.
- Gained knowledge about the semi-conservative method of DNA replication in eukaryotes.
- Came to know about the concept of gene like Benzor's concept and got idea about cistron, mutons, recons and jumping gene.

Mutation

- Learned about the concept of mutation.
- Got idea about the types of mutations and can differentiate between the induced and spontaneous mutation.
- Got idea about different types of mutagens chemical and physical and their difference and mode of action.
- Came to know about the applications of induced mutations in crop improvement.
- Got an idea about DNA damage and repair.

Type of DNA

- Learned about satellite and repetitive DNA.
- Got an idea about genetic code and its characteristics.

Structure of t-RNA

Learned about the detailed structure of clover leaf model of t-RNA.

Gene expression

- Learned about process in transcription and translation in prokaryotes.
- Learned about regulation of gene expression by Lac operon model.

B.Sc. Semester

VPaper I

Carbohydrates

- Learned about the properties and role of carbohydrate.
- Learned about classification of carbohydrate.
- Came to know about the structure of starch and glucose.

Lipids

- Learned about properties and role of lipids.
- Came to know about fatty acids, oils and waxes.
- Learned about beta oxidation.

Amino acids

- Learned about the chemistry of amino acids present in proteins
- Came to know about the classification of proteins

Enzymology

- Learned about characteristics and properties of enzymes.
- Came to know about the nomenclature of enzymes.
- Got an idea about the factors affecting enzyme activity.
- Learned about the terms holoenzyme, apoenzyme, coenzyme and co-factors.
- Learned about the regulation of enzyme activity and mechanism of action.

Plant water relations

- Got an idea about properties of water.
- Learned the concept of diffusion, diffusion pressure deficit and its significance.
- Learned about the concept of osmosis, Its types, potential and significance.
- Came to know concept of imbibition and significance.

Water conduction through xylem

- Learned about root pressure theory and cohesion –adhesion theory
- Came to know about the concepts of transpiration and stomatal opening mechanism with reference to K^+ malate hypothesis.

Phloem transport

- Learned about the mechanism in phloem transport and Munch hypothesis.

Mineral Nutrition

- Learned about the macro and micro nutrients requirement of plants.
- Came to know about the deficiency symptoms of mineral nutrition in plants.

Solute transport

- Learned about the solute transport in plants and its types.

Lipid metabolism

- Learned the process of respiration where students came to know about structure and types of ATP.
- Got an idea of aerobic and anaerobic type of respiration.
- Learned about respiratory substrate and respiratory quotient.
- Learned the biochemical pathways of glycolysis, kreb's cycle and oxidative phosphorylation.
- Came to know about chemiosmotic potential theory.
- Learned about fermentation process.
- Learned phototranspiration and glyoxylate cycle.

Photosynthesis

- Learned about the concept of photosynthesis and its role.
- Got an idea about the photosynthetic pigments and their important role in photosynthesis.
- Got the concept of action spectra, emerson's enhancement effect, red drop mechanism

and

- photolysis of water.
- Learned about cyclic and non cyclic respiration.
- Learned about light dependent reactions C₃, C₄ and CAM pathways and their significance.
- Learned factors affecting photosynthesis.

Nitrogen metabolism

- Learned about mechanism of biological nitrogen fixation and importance of enzyme nitratereductase.

Paper II

Ecology

- Learned about definition, introduction, branches and significance of ecology.
- Learned about different climatic factors and their effect on vegetation.
- Learned edaphic factors like properties of soil and soil profile.
- Learned physiographic factors like biotic factor and their interactions

Biogeochemical cycles

- Learned about Nitrogen and Phosphorous cycle

Ecosystem

- Learned about the biotic and abiotic components of ecosystem.
- Learned the concepts of food chain, food web and ecological pyramids.
- Came to know about autecology
- Learned the concepts of ecad, ecotype and their characteristics and importance.
- Learned about synecology including study of community and their analytical and synthetic characters.

Phytogeography

- Learned about the principles of phytogeography
- Learned about distribution of species and types of distribution.
- Came to know about climatic regions of India and phytogeographic regions of India.

B.Sc. Semester

VI Paper I

Growth

- Learned about the concepts and growth curve and phases of growth.

Phytochromes

- Came to know about role and significance of both type of phytochromes Pr and Pfr.
- Learned circadian rhythms and biological clock.

Plant growth regulators

- Learned about different types of plant growth regulators and their roles in growth and development of plants.

Plant movements

- Learned tropic and nastic movements in plants.

Photoperiodism

- Learned about the effects of light on flowering.
- Came to know about the concept of photoperiodism and vernalization
- Learned about the flowering inducing hormone florigen.

Seed dormancy

- Learned about the concept of seed dormancy, factors causing seed dormancy and methods to break dormancy.

Plant defence

- Learned about different mechanism of plant defence in plants.
- Came to know about the secondary metabolites and their roles.

Plant tissue culture

- Learned about different concepts in plant tissue culture.
- Learned about the methods of sterilization and preparation of culture media.
- Learned about the applications of tissue culture.
- Learned callus and organ culture and its application
- Cybrid production and its application.

Genetic engineering

- Learned about the tools that is enzymes required in genetic engineering.
- Learned about plasmid and its application as vector. Structure of Ti plasmid.
- Learned about the DNA library
- Learned about the gene transfer by *A. tumifaciens*
- Came to know about advantages and disadvantages of transgenic plants.

Paper II

Plant succession

- Learned about the concept of succession and its types.
- Got a knowledge about the causes of succession.

Plant adaptations

- Learned about different adaptations in plants morphological and anatomical .
- Learned physiological responses of hydrophytes, xerophytes and halophytes.

Environmental pollution

- Learned about different types of pollution agricultural, noise and thermal pollution.
- Got the knowledge about how to control the environmental pollution.
- Learned about environmental management.
- Learned and acquired knowledge of natural resources, their types, factors responsible for depletion of resources and conservation methods of forest and water resources.

Microscopy

- Learned and acquired the knowledge of different types of microscopy and their principle.

Electrophoresis

- Learned and acquired knowledge of electrophoresis method by SDS – PAGE and Agarose.

Spectroscopy

- Learned about the technique and its application

Chromatography

- Learned and acquired the knowledge of different types of chromatography technique.

Utilization of plants

- Learned about the morphology, utilization and important chemical constituents of food like wheat, oil like ground nut, fibre like cotton, spices like clove, beverages like coffee, medicinal plant like neem and rubber.

Ethnobotany

- Got introduced with ethnobotany, its branches and importance.

DEPARTMENT OF CHEMISTRY

Programme Outcomes: B. Sc Chemistry

| | |
|--------------------------------|--|
| Department of Chemistry | After successful completion of three year degree program in Chemistry a student should be able to; |
| Programme Outcomes | <p>PO-1. Demonstrate, solve and an understanding of major concepts in all disciplines of chemistry.</p> <p>PO-2. Solve the problem and also think methodically, independently and draw a logical conclusion.</p> <p>PO-3. Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions.</p> <p>PO-4. Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.</p> <p>PO-5. To inculcate the scientific temperament in the students and outside the scientific community.</p> <p>PO-6. Use modern techniques, decent equipments.</p> |

| | |
|--|---|
| Programme Specific Outcomes B.Sc | PSO-1. Gain the knowledge of Chemistry through theory and practical's. PSO-2. To explain nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions. PSO-3. Identify chemical formulae and solve numerical problems. PSO-4. Know structure-activity relationship. PSO-5. Understand good laboratory practices and safety. PSO-6. Develop research oriented skills. PSO-7. Make aware and handle the sophisticated instruments/equipments. |
| Course Outcomes B. Sc Chemistry <u>Semester-I</u> | |
| Course | Outcomes After completion of these courses students should be able to |
| Physical Chemistry CH-102 | CO-1. Understand the basic of Thermodynamics CO-2. Understand the term specific volume, molar volume and molar refraction CO-3. Understand Gaseous state of matter & their behavior & Properties CO-4. Understand the Properties of Liquids, Classification of Liquid Crystal & applications in Real world. |
| Inorganic Chemistry CH-101 | CO-1. Understand the Atomic structure & Periodic Properties. CO-2. Understand Theories of Bonding. CO-3. Understand S-Block, P-Block & Noble gases: their Properties, Bonding Application. |

Course Outcomes B. Sc Chemistry
Semester-II

| | |
|--|---|
| CH-201 Organic Chemistry | CO-1. Define structure & Bonding of Hydrocarbon, Mechanism of Common Organics reactions. CO-2. Distinguish between geometrical and optical isomerism. CO-3. Discuss mechanism of Alkanes & Cycloalkanes Reactions.of Alkanes & Cycloalkanes Reactions. CO-4. Understand the Nomenclature & Aromaticity of Benzene derivatives. |
| CH-202 Physical Chemistry | CO-1. Know the Second law of Thermodynamics & Functions related with them. CO-2. Write an expression for rate constant K for third order reaction CO-3. Solve the numerical problems based on Rate constant CO-5 Know the meaning of phase, component and degree of freedom |
| Course Outcomes B. Sc Chemistry <u>Semester-III</u> | |
| CH-301 Inorganic Chemistry | CO-1. Know the Chemistry of Lanthanides & Actinides CO-2. Errors in Chemical analysis. CO-3. Able to understand the Chemistry of Transition Series elements. |
| CH-302 Organic Chemistry | CO-1. Understand the Classification & reaction mechanism of Alcohols & Phenols. CO-2 Understand the Reaction mechanism of Aldehydes & Ketones. CO-3. Understand the Reaction Mechanism of carboxylic acids |

| Course Outcomes B. Sc Chemistry <u>Semester-IV</u> | |
|---|---|
| CH-401 Inorganic Chemistry | CO-3. Know the limitations of VBT CO-4. Know the shapes of d-orbital's and degeneracy of d-orbital's CO-5. Draw the geometrical and optical isomerism of complexes CO-1. Know the meaning of various terms involved in co-ordination chemistry CO-2. To understand Werner's formulation of complexes and identify the types of valences |
| CH-402 Physical Chemistry | CO-1. Solve the cell reaction and calculate EMF.. CO-2. Calculate interplanar distance in solids. CO-3. Understand The Rotational & Vibrational Spectra of Particles. CO-4. Understand basics of Quantum mechanics. CO-5. Understand De-Broglie hypothesis and Uncertainty principle CO-6. Derive Schrodinger's time dependent and independent equations |
| Course Outcome B.Sc Chemistry B.Sc -VI | |
| CH-501 Organic Chemistry | CO-1. To study UV, IR spectroscopy. CO-2. Discuss different types of rearrangement reactions. CO-3. Understand the Chemistry of Heterocyclic Compounds |
| CH-502 Physical Chemistry | CO-1. Understand the Thermodynamics of cell Reactions. CO-2. Understand the physical picture of Orbital through the applications of Quantum mechanics.. CO-3. Understand Photochemistry & Raman Spectra & its application. CO-4. Understand the Chemistry of Macromolecules. |
| Course Outcome B.Sc Chemistry B.Sc -VI | |

| | |
|----------------------------------|--|
| CH-601 Inorganic Chemistry | CO-1. Understand the Electronic Transition of Metal Complexes. CO-2 Understand the Magnetic Properties, Kinetic & Thermodynamic aspects of Transition metals. CO-3. Understand the Bonding, Nomenclature of Organometallic Compounds |
| CH-602 Organic Chemistry | CO-1. Can Elucidate structure of Organic Compounds on the basis of NMR. CO-2. Understand the function of dyes, paints and pigments. CO-3. Understand study the various type of surfactants. CO-4. Understand the Chemistry of Drugs & dyes. |

Programme Outcomes: M. Sc Organic Chemistry

| | |
|------------------------------------|---|
| Department of Chemistry | After successful completion of two year degree program in chemistry a student should be able to; |
| Programme Outcomes | . PO-1. Determine molecular structure by using UV, IR and NMR. PO-2. Study of medicinal chemistry for lead compound. PO-3. Improve the Skill of student in organic research area. PO-4. Synthesis of Natural products and drugs by using proper mechanisms. PO-5. Study of Asymmetric synthesis. PO-6. Determine the aromaticity of different compounds. PO-7. Solve the reaction mechanisms and assign the final product. |
| Programme Specific Outcomes | PSO-1. Know the structure and bonding in molecules/ ions and predict the Structure of molecule/ions. PSO-2. Understand the various type of aliphatic, aromatic, nucleophilic substitution reaction. PSO-3. Understand and apply principles of Organic Chemistry for understanding the scientific phenomenon in Reaction mechanisms. PSO-4. Learn the Familiar name reactions and their reaction mechanisms. PSO-5. Understand good laboratory practices and safety. PSO-6. Study of organometallic reactions. PSO-7. Study of free radical, bicyclic compound, conjugate addition of Enolates and pericyclic reactions. PSO-8. Study of biological mechanisms using amino acids. |

Department of Mathematics

Session 2019-2020

Programme Outcomes of B.Sc.

1. Understand the basic concepts, fundamental principles, and the scientific theories related to scientific phenomena and their relevancies in the day-to-day life.
2. Being able to think creatively to propose novel ideas in explaining facts and figures or providing new solution to the problems.
3. Recognize real-world problem that are related to mathematical analysis, and formulate mathematical models of such problems.
4. Use Mathematical and statistical techniques to solve well-defined problems and present their mathematical work, both in oral and written format, to various audiences.
5. Formulate the analysis of mathematical and statistical problem, precisely define the key terms, and draw clear and reasonable conclusions.
6. Read, understand and construct correct mathematical statistical proofs and Use the library and electronic data-bases to locate information on Mathematical problems.

Department of Mathematics

Session 2019-2020

Course outcomes

B.Sc Ist sem

Paper I: Algebra and Trigonometry

| Course | Outcomes |
|---------------|---|
| CO:111 | Use Matrices to solve system of linear equations. |
| CO : 112 | Find roots of polynomial equation in one variable |
| CO : 113 | Understand the basic concept of complex analysis. |
| CO :114 | Understand the basic concept of Group Theory. |

Paper II : Calculus

| Course | Outcomes |
|---------------|--|
| CO : 121 | Discus the concept of Taylor and Maclaurin series and form the Sine and cosine series. |
| CO : 122 | Examine about Leibnitz's theorem. |
| CO: 123 | Students can derive the Euler's theorem on homogeneous function. |
| CO: 124 | Enables to understand Partial derivatives of higher order |

B.Sc IInd Sem

Course

outcomes

Paper I : Geometry, Differential and Difference Equation

| Course | Outcomes |
|---------------|---|
| CO : 211 | Justify the concept of Exact differential equation. |
| CO : 212 | Allow to discuss about Euler's equidimensional equation . |
| CO : 213 | Students can derive the angle of intersection of two sphere. |
| CO : 214 | Enables to understand differential equation of first order order. |

Course outcomes

Paper II : Vector calculus and improper integrals

| Course | Outcomes |
|---------------|--|
| CO : 221 | Understand the concept of line Integral, work done, conservative vector field. |
| CO : 222 | Use double integration to find area. |
| CO : 223 | Solve problems on vector Integration (Surface Integral, Volume Integral). |
| CO : 224 | Evaluate Improper Integrals. |

B.Sc.- IIIrd Sem

Course

Outcomes

Paper I-Advanced Calculus, Sequence and Series

| Course Code | Course Outcomes |
|--------------------|--|
| CO:311 | Learn to investigate limit and continuity of function of two variables. Learn to construct Taylor's theorem for the function of two variables. |
| CO:312 | Learn to analyze the concept of envelopes. Learn to investigate maxima, minima and saddle points of function of two variables. |
| CO:313 | Learn to examine whether the sequence is convergent or divergent using Cauchy criterion |
| CO:314 | Learn to examine whether the series is convergent or divergent using appropriate tests |

Course Outcomes

Paper II -Differential Equation and Group Homomorphism

| Course Code | Course Outcomes |
|--------------------|---|
| CO:321 | Able to evaluate Bessel's function and Bessel's Integral |
| CO:322 | Learn to evaluate Laplace transform and inverse Laplace transform |
| CO:323 | Able to: apply Laplace transform to solve ordinary linear differential equation, Evaluate Fourier transform, Fourier sin and cosine transform |
| CO:324 | Learn to: explain group, abelian and cyclic group, investigate given set is group, normal subgroup |

B.Sc.- IVth Sem

Course

Outcomes

Paper I-Partial differential equation and calculus of variation

| Course Code | Course Outcomes |
|--------------------|---|
| CO:411 | Solve Pfaffian differential equation and construct partial differential equations by eliminating arbitrary function and arbitrary constants. |
| CO:412 | Learn to solve: Lagrange's equation, Integral surface passing through given curve, Charpit's method, Jacobi's method. |
| CO:413 | Linear partial differential equation of second order and Homogeneous and Non-homogeneous linear partial differential equations with constant coefficients |
| CO:414 | Learn to define functional, investigate continuity and extremum of a functional, |

Course Outcomes

Paper II-

Mechanics

| Course Code | Course Outcomes |
|--------------------|--|
| CO:421 | Able to assess intrinsic and cartesian equation of catenary |
| CO:422 | Learn to examine radial, transverse, tangential and normal components of velocity and acceleration |
| CO:423 | Learn to construct Lagrangian for the given system of particles |
| CO:424 | Learn to explain velocity-dependant potential, dissipation function central orbits and reduce two body problem to one body problem |

B.Sc.- Vth Sem

Course

OutcomesPaper

I: Analysis

| Course | Outcomes |
|---------------|--|
| CO : 511 | Explain the concept of Fourier series and form the sine and cosine series. |
| CO :512 | Enables to discuss about Riemann-Stieltjes Integral |
| CO :513 | Students can derive the analytic function in various problems |
| CO :514 | Enables to understand Mobius transformation |

Course outcomes

Paper II - metric space, Complex integration & algebra

| Course | Outcomes |
|---------------|---|
| CO:521 | Define and recognize the concept of metric space, open sets, closed sets, limit point, interior point |
| CO:522 | Define and illustrate the concept of completeness |
| CO:523 | Define rings, zero division of a ring, integral domain, field and prove theorem |
| CO:524 | Use Cauchy's integral theorem and formula to compute line integrals |

B.Sc.- VIth Sem

Course

Outcomes

Paper I : Abstract Algebra

| Course | Outcomes |
|---------------|--|
| CO : 611 | Enables to use group and properties |
| CO : 612 | Student can understand the concept of vector space |
| CO : 613 | Find rank, nullity and kernel |
| CO : 614 | By using transformation represent matrix form |

Course outcomes

Paper II : Special theory of relativity

| Course | Outcomes |
|---------------|---|
| CO:621 | Define and recognize the Lorentz transformation and Galilean transformation |
| CO:622 | Define the various types of definition related to transformation |
| CO:623 | Define tensor and illustrate the various types of tensor |
| CO:624 | Describe the equivalence and mass energy equation |

JEEVAN VIKAS MAHAVIDYALAYA, DEVGRAM

Department of Mathematics

Session 2019-2020

Specific outcomes of B.Sc

1. In banking sector students can get in to with mathematics.
2. They can prepare for MPSC and UPSC exam.
3. Mathematics graduate can work as finance and investment analyst and advisor And chartered or certified accountant.
4. A career in teaching offers unparalleled job satisfaction.

-

Program Outcomes, Program Specific Outcomes and Course Outcomes

DEPARTMENT OF MICROBIOLOGY

SESSION-2019-2020

PROGRAM OUTCOMES (POs)

Name of Program: B. Sc. MICROBIOLOGY :

- Students will be able to acquire, articulate, retain and apply specialized language and knowledge relevant to microbiology.

- Students will acquire and demonstrate competency in laboratory safety and in routine and specialized microbiological laboratory skills applicable to microbiological research or clinical methods, including accurately reporting observations and analysis.
- Students will communicate scientific concepts, experimental results and analytical arguments clearly and concisely, both verbally and in writing.
- Students will demonstrate engagement in the microbiology discipline through involvement in research or internship activities, the microbiology student association club (MSA) and outreach or mentoring activities specific to microbiology.
- Students study microscopic living systems and organisms. They can work across a spectrum of private industries or government agencies. Cell biologists focus on the uses, functions, development and lives of cells and their related systems and interaction

PROGRAM SPECIFIC OUTCOME OF B. Sc. MICROBIOLOGY (PSOs)

This course presents the study of Micro organisms. On successful completion of the subject the students should have understood the Role of microorganisms in the diversity.

- A general course emphasizing distribution, morphology and physiology of microorganisms in addition to skills in aseptic procedures, isolation and identification.
- This course also includes sophomore level material covering immunology, virology, epidemiology and DNA technology.
- Recommended for all allied health students. Three hours lecture and four hours lab per week.
- With the individual Research projects, Research orientation will be improved which is reflected in the form of papers and conference presentations.
- Applied papers are advanced, making the students updated in the field. More number of practicals is there in the course making the students well versed with the subject.

Statements of Course Outcomes (COs)

Course: Sem I Paper 1 : History & Microbial physiology

By the end of this course, the students will be able to:

1. Understand the contributions of eminent scientists in the development of microbiology
2. Understand the ultra structure of bacterial cell
3. Compare the differences in bacterial cell with plant cell and animal cell
4. Classify the bacteria on the basis of various parameters.

Course: Sem I Paper 2 : Microbial diversity

By the end of this course, the students will be able to:

1. Compare prokaryotic organism with eukaryotic organism
2. Understand the importance of methane producing bacteria
3. Write the method of reproduction in algae fungi and protozoa
4. Understand and compare the characteristics properties of virus with other microbes
5. Understand various kinds of positive and negative interactions of different microbes

Course: Sem I LAB

By the end of this course, the students will be able to:

1. Understand working and mechanism of different equipments and tools used in microbiology
2. Prepare various nutrients media for cultivating microbes in laboratory
3. Perform the staining technique of various bacteria
4. Design an experiment to isolate specific bacteria in pure form from sample
5. Determine the sensitivity of specific bacteria to given antibiotics

Course: Sem II Paper 1 : Microbial physiology

By the end of this course, the students will be able to:

1. Understand the basic nutritional requirements of bacteria
2. Describe various types of nutrient media for cultivation and isolation of bacteria
3. Explain typical growth curve of bacteria
4. Understand the factors that responsible for bacterial growth
5. Explain mechanism of bacterial cell injury by an anti-microbial agent like anti-biotic.

Course: Sem II Paper 2 : Microbial Techniques

By the end of this course, the students will be able to:

1. Understand and explain basic principles and different kinds of microscope
2. Explain the process of different staining techniques
3. Understand and compare various types of stains and dyes
4. Analyze the determination of specific nutrients by bacteria

Course: LAB Sem 2

By the end of this course, the students will be able to:

1. Enumerate bacterial load in the food sample in quality unit
2. Cultivate bacteria in the lab by using aerobic & anaerobic techniques
3. Demonstrate antimicrobial power of heavy metal ion against any bacteria
4. Demonstrate effect VV radiations of bacterial growth.

Course: Sem III Paper 1 Chemistry of organic Constituents and Enzymology

By the end of this course, the students will be able to:

1. Understand the classification of organic compounds like carbohydrates
2. Understand the chemistry of different kinds of carbohydrates
3. Describe importance of vitamins to human body and their deficiency syndrome
4. Compare DNA and RNA
5. Understand the mechanism of enzyme.

Course: Sem III Paper 2 Industrial Microbiology

By the end of this course, the students will be able to:

1. Understand and describe scope of industrial microbiology
2. Understand and operate fermenters in various industries
3. Explain the process of commercial production and ethanol Vitamin B2 Beer, Wine Penicillin etc.
4. Perform the methods and harvesting and product recovery in industrial fermentations
5. Work out the maintenance of fermenter or plant.

Course: LAB Sem III

By the end of this course, the students will be able to:

1. Design practical experiments to identify carbohydrates from given sample

2. Demonstrate enzyme activity by bacteria
3. Understand the techniques to estimate proteins, RNA, DNA from given sample
4. Design an experiment to produce ethanol by fermentation technique
5. Demonstrate application of yeast in baking industry

Course: : Sem IV Paper 1 Metabolism

Course outcomes: By the end of this course, the students will be able to:

1. Understand the general strategy of metabolism
2. Understand and explain various metabolic processes operating in living cell
3. Understand the mechanism by which energy is generated in human body
4. Explain and describe the process of protein formation in living cell
5. Explain and describe the process of replication of DNA

Course: Sem IV Paper 2 Metabolism Applied Microbiology

Course outcomes: By the end of this course, the students will be able to:

1. Understand and explain the significance of bacteriological analysis of drinking water
2. Understand and describe various methods applied for treatment of water and waste water
3. Explain the methods for disposal of industrial wastes
4. Understand the role of microbes of soil in various important processes
5. Describe and explain the applications of bacteria and fungi in bio fertilizers

Course: LAB Sem IV

Course outcomes: By the end of this course, the students will be able to:

1. Understand the techniques to isolate microbes from water and waste water(sewage)
2. Understand and demonstrate chlorination of water
3. Demonstrate the technique to find out the alkalinity of water sample
4. Design the experiment to find out quality of raw material
5. Find out microbial load in given drinking water sample.

Course: Sem V Paper 1 Medical Microbiology

Course outcomes: By the end of this course, the students will be able to:

1. Understand and explain the stages of infectious diseases
2. Describe various modes by which infections spread in community

3. Describe various methods that can be adopted to control spread of infection in community
4. Understand and explain various hospital borne, air borne and water-borne diseases
5. Understand how to educate the people about taking care of health
6. Understand the role of drugs in disease control.

Course: Sem V Paper 2 Molecular Biology & Bioinstrumentation

Course outcomes: By the end of this course, the students will be able to:

1. Understand and describe various concepts – related with gene and its regulation
2. Understand and explain various processes by which gene transfer occurs amongst microbes
3. Explain the causes of gene mutation and their effect on cell
4. Understand and explain the principles, methodology and application of various bio instruments likespectrophotometer, electrophoresis, chromatography, centrifuge etc

Course: LAB Sem V

Course outcomes: By the end of this course, the students will be able to:

1. Understand the techniques for isolation of DNA and RNA from living cell
2. Understand and describe liver function test by estimating creatinine from patient's serum
3. Analyze proper chromatography technique to find out unknown organic compounds from sample
4. Understand and design the experiment to diagnose pathogenic organism from patient.

Course: Sem VI Paper 1 Immunology

Course outcomes: By the end of this course, the students will be able to:

1. Understand and describe human body's resistance mechanism against disease
2. Understand and write the role of human body's various organs in natural resistance.
3. Understand the properties, structure and importance of antibiotics in immunity
4. Understand various mechanism by which antibiotic destroys antigens
5. Describe and explain the reasons, classes and development of allergy in humans.

Course: Sem VI Paper 2 Biotechnology

Course outcomes: By the end of this course, the students will be able to:

1. Understand the tools and techniques of genetic engineering
2. Understand and describe DNA, fingerprinting and its application in forensic science
3. Understand the methods of production of health related compounds by biotechnology

4. Understand and write application of biotechnology in agriculture
5. Explain and describe the advantages /disadvantages of genetic engineering for humans
6. Understand the production and importance of genetically modified food

Course: LAB Sem VI

Course outcomes: By the end of this course, the students will be able to:

1. Understand and analyze the experiment to diagnose sexually transmitted disease
2. Understand and describe the detection of typhoid
3. Analyze the production of bio-fertilizer
4. Analyze the production of soyasauce
5. Understand and explain various experiments to diagnose diseases.

and teaching ability.

DEPARTMENT OF PHYSICS

Program outcomes for B.Sc. Course With Mathematics

After the graduation in science science faculty (B.Sc.) a student will be able to

1. Examine the basic concept, fundamental principles and the scientific theories related to various scientific phenomena and rate their relevance in the day to day life.
2. Assess skills in handling scientific instruments, planning and performing experiments in recommended laboratories.
3. Inspect the given scientific data critically and systematically and the ability to draw the objective conclusions.
4. Think creatively to propose novel ideas in explaining facts and figures or providing new solutions to the problems.
5. Developed scientific outlook not only with respect to science subjects but also in all aspects related to life.

COURSE OUTCOME FOR B.Sc. PHYSICS

After completing this course students will able to

B.Sc. I year

SEM I - PAPER I (Properties of Matter and Mechanics)

- Understand the elastic behaviour of materials.
- Analyse the bending behaviour of beams
- Understand the concept surface tension and viscosity of fluid
- Understand the basics of rigid body dynamics.
- Compare the Newton's Laws of motion and Laws of Gravitation.

SEM I - PAPER II (Electrostatics, Time varying fields and Electric currents)

- Demonstrate an understanding of core knowledge in electrostatics.
- Understand the properties of dielectric materials and its behaviour in presence of electric field
- Understand the conversion of electric field and magnetic field and vice versa.
- Understand the basic laws of electromagnetism such as Faraday's Law, Lenz law, Biot Savart Law, Ampere's Law and Gauss Law.

SEM II - PAPER I (Oscillations, Kinetic Theory of gases and Thermodynamics)

- Differentiate between linear and angular S.H.M.
- Illustrate Free oscillations and Damped oscillations.
- Demonstration of forced oscillations and resonance.
- Understand the nature of calorimetry by specific heat of solids and law of thermodynamics and entropy
- Analyses of zeroth law of thermodynamics and entropy
- Understanding the low temperature physics

SEM II - PAPER II (Gravitation, Astrophysics, Magnetism and Magnetostatics)

- Explain Kepler's Laws of Planetary motion.
- Describe the Gravitational potential and Gauss's theorem.
- Predict the constituents of universe (Solar system, Stars, Galaxies)
- Evaluate the mass of sun and planets.
- Categorize Ferromagnetic, Antiferromagnetic and Ferrimagnetic materials.
- Examine Meissner effect and Langevin's theory.
- Analyse Magnetic field, Lorentz force equation and magnetic dipole moment.

B.Sc. II year

SEM III - PAPER I (Sound waves, Applies acoustic, Ultrasonic and Power supply)

- Understand Harmonics, Quality of sound, human ear and its response and its audibility to sound.
- Describe characteristics of the transducers and investigate the requirements of good acoustics.
- Inspect ultrasonic waves, their properties, Methods of generation ultrasonic waves and their applications in research.
- Analyse waves and oscillations.
- Design power supply and explain conversion of A.C. to D. C., importance of voltage, current and load regulation.

SEM III - PAPER II (Physical optics and Electromagnetic waves)

- Elaborate the wave nature of light.
- Analyze the intensity variation of light due to, interference and diffraction.
- Assess the application of Michelson and Fabry-Parot Interferometer
- Analyze the polarization and its applications.
- Interpret the Electromagnetic wave, the Maxwell's field equations, and transverse nature of electromagnetic wave.
- Interpret Poynting's theorem and its importance.

SEM IV - PAPER I (Solid state Physics, X-rays and Lasers)

- Understand the concept of reciprocal space lattice and know the significance of Brillouin zones
- Classify the crystal systems and spatial symmetries, Miller indices.
- Understand how crystalline materials are studied using different diffraction techniques.
- Explain the types, properties and production of X-rays with their applications.
- Elaborate fundamental concepts of LASER and their production along with applications.

SEM IV - PAPER II (Solid state electronics and Molecular Physics)

- Understand the basics of diode and working of rectifier circuits and characteristics
- Analyse the characteristics of transistor and transistor biasing circuits
- Justify the fundamentals, fabrication along with their applications in day to day life of LED, Solar Cell and BJT.
- Investigate the basics along with applications of FET, JFET and MOSFET and their special features.

- Understand and elaborate Quantization of vibrational and rotational energies, types of molecules, Diatomic molecules as harmonic and anharmonic oscillator, Rotational-vibrational spectra, Born Oppenheimer approximation.
- Describe the importance and applications of Raman spectroscopy in molecular physics also know the Frank-Condon principle, Elementary ideas of NMR and ESR and their applications in spectroscopy.

B.Sc. III year

SEM V - PAPER I (Atomic Physics, Free electron theory and Statistical Physics)

- Categorize theories of atomic model and classify quantum numbers.
- Predict the momentums and magnetic moments associated with different motion of electron and their interaction with each other.
- Differentiate electrical and thermal conduction of electron.
- Understand basics of Fermi Energy, Fermi temperature band. Different theorems, models and experiments regarding free electron theory.
- Explain the concepts of μ - space, Gamma space, probability distribution, and thermodynamic probability, Principle of a priori probability, Boltzmann's entropy relation, different states, Maxwell-Boltzmann distribution law, and its application.
- Categorize Bose-Einstein statistics, Fermi-Dirac distribution and its application.

SEM V - PAPER II (Quantum Mechanics, Nanoscience and Nanotechnology)

- Outline the main aspects of the historical development of quantum mechanics and wave properties of matter and able to correlate the classical mechanics with quantum mechanics,.
- Solve Schrodinger equation in one to three dimensions and their physical interpretation.
- Understand the uses of nanoscience and nanotechnology in day to day life and synthesis of nanomaterials.
- Analyse the nanomaterials using different characterization technique.

SEM VI - PAPER I (Relativity, Nuclear Physics and Bio Physics)

- Discuss the concept of Frame of references, Postulates of the special theory of relativity and relativistic variation in, Length, Time, mass, Velocity addition, and Mass energy equivalence.

- Elaborate detectors of radiation, charge accelerators, nuclear reaction along with types of nuclear reactions and their importance in recent technology.
- Understand and able to explain fundamental concepts of decay particles.
- Investigate the terminology Bio physics, and its importance in medical field.

SEM VI - PAPER II (Electronics, Fiber optics, Communication electronics and Digital Electronics)

- Illustrate the fabrication and working principles of Amplifiers and oscillators and their applications.
- Understand the principle and working of Fiber optics, Importance of optical fiber, Propagation of light waves in optical fiber and its importance in communication .
- Classify the Communication types like AM, FM their fundamental theory along with how the broadcasting of television is done by these means.
- Understand the binary arithmetic , logics and Boolean functions.

PROGRAM OUTCOME

NAME OF PROGRAM: B.Sc. Zoology

DEPARTMENT OF ZOOLOGY

Target Graduate Attributes: Disciplinary Knowledge, Critical Thinking, Problem solving, Analytical Reasoning, Communication skills, Teamwork, Moral and Ethical Awareness

| | SPECIFIC PROGRAM OUTCOME |
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| SPO1 | Student will be able to develop aptitude to manifest' wide knowledge in the subject zoology and life sciences. |
| SPO2 | Students will be able to understand about biodiversity ,conservation, based on the knowledge he has acquired from theoretically, practically and field survey studies which will help him to become a scientist, a conservationist, taxonomist, in government owned organisation and non-government organisations. |
| SPO3 | This program will help the student about the diversity of animals and their importance and use as a model for research in various laboratories and in the field of teaching and learning. |
| SPO4 | Students will be able to learn the external and internal organisations of organisms and its functions. |
| SPO5 | Students will gain an insight regarding reproduction and lifecycle of parasitic organisms of vertebrates, and the use of modern medicines to prevent infections. |
| SPO6 | Students will be able to identify and classify the organisms and their larval form ad importance of larvae. |
| SPO7 | Student will gain knowledge and realize the significance of organisms and its relationship with the environment and its impact on human and animal life. |
| SPO8 | Students will gain knowledge and understanding about physiological functions which are under the control of endocrine hormones and working of the body of animals under the nervous control. |
| SPO9 | Student will gain insight regarding the biological rhythm which are governed by external environmental factors and internal factors like biological rhythm and biological clocks and their role in the life, evolution and diversity of organisms on earth. |
| SPO10 | Students will aquire knowledge of enzymes, hormones and their role in mammalian physiology, learn Mendelian principles of genetics, DNA fingerprinting technique and its application. |

Name of the Program: B.Sc. I

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| | Course Outcome |
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| | Course Name |
| | Life and Diversity- protozoa- Annelida |
| CO1 | Student will be able to classify protozoans on the basis of morphological characters and learn the structure, reproduction, lifecycle and the diseases caused by parasitic protozoans of man. |
| CO2 | The students will gain knowledge and understanding to classify porifera based on general characters and learn the structure reproduction and development, and canal system. |
| | Students will gain knowledge to classify coelentrate based on external characters, learn about structure, lifecycle and coral reformation |
| CO3 | Students will gain knowledge and understanding of general characters of helminths to classify depending on their general characters. They will also learn the structure, reproductive system and lifecycle and parasitic adaption of Ascaris and Taenia solium |
| CO4 | Students will acquire knowledge of general characters of Annelids and will learn to classify them. Students will learn morphology, digestive and urinogenital system of Leech, significance of trochophore larva and importance of vermiculture. |
| | Environmental Biology |
| CO1 | Students will be able to learn about the atmosphere, hydrosphere, lithosphere, renewable and non-renewable energy sources. |
| CO2 | Student will be able to learn about the ecosystem, pond ecosystem, food chains, food web and ecological pyramids. They will also learn about the energy flow in the ecosystem their shape and universal model. |
| CO3 | Students will be able to learn about biodiversity and its conservation, causes of reduction of biodiversity. They will learn about the wildlife conservation and about the hotspot of biodiversity in India. |
| CO4 | Students will be able to learn about the sources, effects and control measures of pollution, acid rain, water pollution. They will also learn about the control measures of noise pollution and also about the toxic effect of heavy metals. |

Name of the Program: B. Sc. Sem II

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| | Course Outcome |
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| | Course Name |
| | Life and Diversity of Animals-No chordates (Arthropoda to Hemichordates) |
| CO1 | Student will be able learn about the Phylum Arthropoda. They will learn about their characters and classification, digestive and reproductive system of insects and will learn about the lifecycle of crustacean larvae. |
| CO2 | The students will gain knowledge and understanding to classify Mollusca based on general characters and learn about the pearl formation and molluscan larvae. |
| CO3 | Students will gain knowledge and understanding of general characters of Echinodermata to classify depending on their general characters. They will also learn the external features, water vascular system and locomotion in Starfish. They will also learn about the echinoderm larva. |
| CO4 | Students will acquire knowledge of general characters of Hemichordate, Balanoglossus, their external features and digestive system and their affinities. |
| | Cell biology |
| CO1 | Students will be able to learn about the ultrastructure of prokaryotic and eukaryotic cell. Plasma membrane, endoplasmic reticulum and Golgi complex. |
| CO2 | Student will be able to learn about the ultrastructure of mitochondria, glycolysis and Kerb's cycle. They will also learn about the electron transport system and lysosomes. |
| CO3 | Students will be able to learn about the ultrastructure of nucleus, structure of nucleolus. They will learn about the structure and types of chromosomes and giant chromosomes. |
| CO4 | Students will be able to learn about the Lake model of and function of Ribosomes, somatic cell division, meiosis and synaptonemal complex. They will also learn about the cellular ageing, elementary idea of cancer and its causative agents. |

Name of the Program: B. Sc. Sem III

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| | Course Outcome |
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| | Course Name |
| | Life and Diversity of Protochordates- Amphibia |
| CO 1 | Student will be able learn about the characters and about the classification of protozoa. They will also understand the structure, digestive system, circulatory system of Herd mania and the role of the same. |
| CO 2 | Students will be able to learn about the about prosses o, gamete genesis and formation of types of eggs. They will also understand the prosses of fertilization of eggs and import once in continuity of animal species. |
| CO 3 | Students will gain knowledge and understanding of salient features of Chondrichthyes and Osteichthyes fishes and will be able to learn to identify them on the basis of the differences and gain knowledge of origin of paired fins which help foe locomotion. |
| CO 4 | Students will acquire knowledge of amphibians based on craters various class of animals and dual ways use to live land an in water. Students will learn use of vital stain which are nontoxic to cells in dilute concentration. they help in making ectoderm, mesoderm and endoderm cells end blastula frog they will also understand about migration of cells to three germinal layers. |
| | Genetics |
| CO 1 | Student will learn about Mendelian principle, interaction of genes, quotative genetics and about the extracellular genome. |
| CO 2 | Student will gain knowledge of the Cytoplasmic Inheritance, the kapa particles, paramecium, drosophila and mice. they will also learn about the linkage and crossing over, concepts of genes and about the disorders in human beings. |
| CO 3 | Students will learn about the sex determination in humans and I drosophila and Bonellia. They will also understand about the chromosol aberration, gene mutation and also about the disorders related to chromosomal numbers. |
| CO 4 | Students will learn about the lethal genes their concepts and consequences. They will also understand about the population genes, their basic concepts and genetic consequences theory introduction, purpose, hereditary diseases and disorders. They will also learn about applied genetics, DNA fingerprinting. |

Name of the Program: B.Sc. IV

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| | Course Outcome |
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| | Course Name |
| | Life and Diversity of Animals-Chordates (Reptiles, Aves and Mammals) |
| CO1 | Student will be able learn about the classification of Reptiles based on Temporal Vacuities, poison apparatus, biting mechanism. they will also learn about Aves their comparison of Radiate and craniate and about general characters of Mammals. |
| CO2 | The students will gain knowledge and understanding about the modern theories of evolution, Darwin and Neo-Darwin. Adaptation in aquatic, cursorial, and volant. They will be introducing to genetic basics of evolution. They will also learn about the races in man. |
| CO3 | Students will gain knowledge about the comparative account of aortic arches and heart. They will learn about the structure of hen's eggs, development of chicks, development of extra embryonic member. |
| CO4 | Students will acquire knowledge of blastocyst and immolation in mammals, types and function of placenta. They will learn about sources type and ureses of stem cell they also gai knowledge of biology of clock and role of pheromones. |
| | Molecular biology and Immunology |
| CO1 | Students will be able to learn structure, forms and properties of DNA and RNA. They will gain knowledge about the gene structure in prokaryotes and eukaryotes and also about recombination in bacteria. |
| CO2 | Student will be able to learn about DNA replication, genetic code protein synthesis and gene regulation model. Their properties mechanisms and concepts. |
| CO3 | Students will be able to learn about the concepts of immunity, structures function types of antigen and antibody. Also, about the precipitation and angulation of antigen-antibody reaction. |
| CO4 | Students will gain knowledge about the types of Immune response, complement system their basic concepts. They will also learn about the general accounts of cytokines and their role at the molecular level, autoimmune diseases and their treatment. |

Name of the Program: B. Sc. Sem V

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| | Course Outcome |
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| | Course Name |
| | General Mammalian Physiology-I |
| CO1 | Student will be able learn about the distribution and chemical nature of enzymes, properties and factors affecting their activity at the molecular level. |
| CO2 | The students will gain knowledge and understanding about the structure and function of digestive gland such as salivary, gastric, intestinal, liver and pancreas; gastrointestinal hormones their role in nutrition and digestion; digestion and absorption of proteins, lipids and carbohydrates, fats soluble in water vitamin soluble sources, deficiencies and diseases. |
| CO3 | Students will gain knowledge about the types, distribution and properties of respiratory pigments, mechanism of respiration, exchange of O ₂ and Co ₂ at cellular level and disorders and effects of smoking. |
| CO4 | Students will acquire knowledge composition and functions of blood, blood clotting-intrinsic and extrinsic factors and rh factors and their role in blood transfusion during emergency, cardiac cycle, ECG and blood pressure help in monitoring the heart conditions |
| | Applied Zoology-Aquaculture and Economic Entomology |
| CO1 | Students will be able to learn about the site selection, construction, restocking and post stocking, management of nursery, raring and stocking ponds. They will technique of breeding of fishes and bundh and Chinese hatcheries, induce breeding by hypothecation, use of new generation drugs in induced breeding, acquire knowledge fish culture, cage culture and integrated fish farming, and fish by-products and fish preservation. |
| CO2 | Student will be able to learn about the technique of culture of prawns and pearl; fabrication and setting up of aquarium and its maintenance, breeding of life bearers and egg layers of aquarium fishes and control of diseases caused by fungi, bacteria, protozoa and helminths and their ill effects of fish health's. |
| CO3 | Students will learn about the chemical control of pests using insecticide like pyrethroids, carbamate and mode of action, merits and demerits; control using predators and parasites which are biological agents their merits and demerits. they will acquire knowledge of cotton spotted bollworm which cause damage to stored grain pests which cause economic losses, the housefly and distally cause nuisance to humans and animals as they are animal pests. |

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| CO4 | Students will gain knowledge of lifecycle and rearing of mulberry silkworm, lifecycle and rearing of non-mulberry silkworm, obtain silk fabric by cocoon boiling, realign, revealing, win sling, twisting and weaving; learn about the lifecycle culture movable frame beehive, bee products and economic importance of various types of honey bees reared in apiary, they will also gain knowledge of lac insects, its lifecycle, lac processing, lac products and its economic importance. . |
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Name of the Program: BSc VI

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| | Course Outcome |
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| | Course Name |
| | General Mammalian Physiology-II |
| CO1 | Student will be able learn about the EM structure and types of neurons, nerve impulse conduction; ultrastructure of striated muscles, properties of muscles and their role in mammalian physiology. |
| CO2 | The students will gain knowledge and understanding about the structure of uriniferous tubules, counter current mechanism of urine formation and excretion normal and abnormal constituents of urine. |
| CO3 | Students will gain knowledge about the structure and function of pituitary, thyroid parathyroid, adrenal and pineal gland respectively and their functions in controlling body physiology. |
| CO4 | Students will acquire knowledge of reproduction, oestrous and menstrual cycle, male and female sex hormones causes of infertility in male and female and use of mechanical and hormonal contraceptives, invitro fertilization to overcome sterility in humans and animals. |
| | Applied zoology |
| CO1 | Students will be able to learn biotechniques, concepts like sterilization, biomolecule separation, SDS-PAGE, agarose gel electrophoresis, principles of colorimetry and spectrophotometry. |
| CO2 | Student will be able to learn about lab technique called biotechnology which includes fixations, dehydration, clearing, embedding and section cutting, difficulties faced during section cutting and remedies; double staining hematoxylin and eosin routine staining technique, histochemical localizes carbohydrate by periodic acid Schiff, protein by methyl bromophenol blue and lipid by Sudan black technique. |

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| CO3 | Students will learn about the basic concepts of rDNA technology, genetic isolation method by shotgun cloning, isolation of gene using DNA manipulation enzymes like nucleases, ligases and polymerases, they will acquire knowledge |
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| | of cloning vectors and splicing, insertion of DNA and ligation using blunt ends, cohesive end and cloning vectors and production of insulin and vaccine. |
| CO4 | Students will gain knowledge and understanding of basic concepts, importance, and role of bioinformatics in life sciences, types of data bases, nucleotide sequence databases and elementary idea of protein databases and use of biostatistics for tabulation and presentation of data respectively. Sampling error, mean, mode, median, probability, standard errors and standard deviation in analysis of biological data related to research. |