

कार्यालय प्राचार्य, शासकीय माता कर्मा कन्या महाविद्यालय, (मचेवा) महासमुंद (छ.ग.)

(NAAC Accredited) Email –

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Affiliated to Pt. Ravishankar Shukla University Raipur (CG)

PROGRAM OUTCOME: DEPARTMENT OF ARTS

After completing bachelor program in Arts, a student will be able to develop:

1. Critical Thinking: Ability to identify, construct and evaluate arguments, ability to engage in reflective and independent thinking, integrates diverse sources of knowledge in solving problems.
2. Communication Skills: Develop oral and written skill for effective Communication, active participation in group activities will improve active learning skills and expressive skills and self confidence.
3. Social Adoptability Skills: Ability to communicate and share our thoughts & feeling with others, develop social interactions and become socially responsible individual (human being).
4. Ideal Citizen: Respect the value, principle ethics and contribute to society and community engage in civic responsibility and participate in civic life through volunteering.
5. Ethical Value: Inculcate ethical, moral and human values.
6. Environmental Awareness: Border understands of the local, national and global environment issues.
7. Employability: Preparing students for job prospect in organized sector.

PROGRAM SPECIFIC OUTCOME OF GEOGRAPHY

- To learn the location of places and the physical and cultural characteristics of those places in order to function more effectively in our increasingly interdependent world.
- To understand the geography of past times and how geography has played important roles in the evolution of people, their ideas, places and environments.
- To develop map of territory, country and the world to understand the —where of places and events.
- To recognize spatial distributions at all scales — local and worldwide — in order to understand the complex connectivity of people and places.
- To appreciate Earth as the homeland of humankind and provide insight for wise management decisions about how the planet's resources should be used.
- To understand global interdependence and to become a better global citizen.

COURSE OUTCOMES -

B.A. - I Subject: Geography Paper I (Paper Name-Physical Geography) -: To understand the structure of different part of earth and applied oceanography and climatology.

Paper –II(Human Geography): Understand different region of human geographical knowledge and human and environment relationship.

Paper –III: Practical Geography Map making and scale of the maps and diagrams and statistical techniques, knowledge about chain tap survey.

B.A. - II Subject: Geography

Paper- I: Economic & Resources Geography

Main concepts of economic geography & resource use and conservation to know about agriculture regions of the world.

Paper-II : Regional Geography with Special Reference to India

Understand regional Geography of India their physical and culture features.

Paper- III: Practical Geography

Making projections and statistical methods to know about weather map & prismatic compass survey.

Survey. B.A. - III Subject: Geography

Paper-I: Remote sensing & GIS.

Understand importance of Remote Sensing & G.I.S.

Paper- II: Geography of Chhattisgarh

Knowledge of physical and cultural characteristics of Chhattisgarh state.

Paper III: Practical Geography

Understand Topographical Sheets and socio-economic survey of village.

Course Outcomes: M.A. Geography

M.A.-Ist Sem. Subject: Geography

Paper- I: Geomorphology

Understand the structure of different part of earth and applied geomorphology.

Paper- II: Climatology

Understand the structure of atmosphere and different type of climate and its characteristics.

Paper III: Geographical Thought

Brief knowledge of history & development of Geographical Thought contributions of various schools of thoughts.

Paper- IV: Geography of India

Knowledge of physical and socio-economical characteristics of India including Chhattisgarh.

Paper V: Practical Geography Cartography

Acquire knowledge in the field of map Making and Advanced Cartographic techniques.

M.A.- 2nd Sem.

Subject: Geography

Paper- I: Economic and Natural Resource Management

Study of natural resource management and optimum uses of resources.

Paper-II: Oceanography

Understand characteristics of oceanic water and their movement.

Paper- II: Regional Development and Planning

Understand specific regions and their development.

Paper- IV: Social Geography

To know how to grow society and their geographical aspect.

Paper- V: Practical-II Map Projections, Map Interpretation and Surveying

Understand map projection Geological map, Topographical knowledge and digital surveying by advanced equipments.

MA.- 3 rd Sem.

Paper-I: Population Geography

Knowledge of population condition of the world and related problems.

Paper-II: Settlement Geography

Understand rural and urban development of settlement and their problems

Paper- III Biogeography & Ecosystem

Acquire knowledge of Environment Habitat & Ecosystem Bio diversity & conservation.

Paper- IV: Research Methodology

Understand research techniques and their uses.

Paper- V: Practical-II Remote sensing and Quantitative technique

Knowledge of remote sensing, Geographic Information System.

MA.- IV th Sem.

Subject: Geography

Paper-I: Geography of health

Knowledge of Human Health and their problems Geographical Factors effecting human health and diseases.

Paper- II: Agriculture Geography

Knowledge of Agriculture Regions and their theories.

Paper- II : Environmental Geography

Understand elements of environment and its problems and management.

Paper. IV:

Field work (Physical and Socio Economic Survey & Report Writing)

Understand survey Technique and Village Survey Field Work experience
Tabulation and data processing construction of maps & Diagram.

Paper. Practical Geography

Statistical methods and new techniques GIS & GPS

PROGRAM SPECIFIC OUTCOME OF POLITICAL SCIENCE

- 1) Understand basic concepts of Politics.
- 2) Inculcate basic concepts of Indian Constitution and development of Indian National Movement.
- 3) Understand basic ideas of Political Thinkers and important Isms.
- 4) Be acquainted with Constitutions.
- 5) Get basic concepts of International Politics and Relations.
- 6) Get Primary and Critical/Analytical knowledge of Public Administration.

Course Outcome -

B.A. (Ist)

Paper I (Political Theory):

- 1) Know about Political Science and Political Theory and fundamental Modern Concepts of Political Science.
- 2) Know basic concepts of State, Sovereignty, Citizenship, Rights, Law, Liberty, Justice, Party Systems, Constitution, Forms of Government, and others.

Paper II (Indian Government and Politics):

- 1) To know about Indian National Movement and salient features of Indian Constitution and major issues of Indian Politics.

B.A. (IInd)

Paper I (Political Thought):

1) Know about main Western and Oriental thinkers like Plato, Aristotle, Machiavelli, Manu,

Kautilya, Gandhi and Ambedkar.

2) Know about different Isms like Idealism, Individualism, Socialism, Liberalism, Fascism and others.

Paper II (Comparative Government and Politics):

1) Know about different Constitutions and their Features, Practices and Institutions.

2) Know about Modern theories like Political System Theory, Structural Functionalism, Political Modernisation, Political Development and Political Culture.

B.A. (IIIrd)

Paper I (International Politics and Indian Foreign Policy):

1) Know about the importance, features and theories/concepts of International Politics.

2) Know about fundamental issues of International Politics like Environmentalism, International

Terrorism, Globalisation, Disarmament and Human Rights.

Paper II (Public Administration):

1) To gain knowledge of Public Administration and its theories.

2) To get knowledge of Development, Financial Administration and Control Mechanism, Corruption, Bureaucracy and Public Relations.

PROGRAM SPECIFIC OUTCOME OF SOCIOLOGY

- 1 To understand the nature and structure of human society
- 2 To Analysis human Society and its likeness and difference Determine Social variables like status, Role & Cast Difference.
- 3 Understand the Structural and Functional changes of India.

Course Outcomes:

B.A. I Sociology,

Paper I: Paper Name – Introduction to Sociology.

To gain general knowledge of Basic concept of sociology, Social Institutions, Family and kinship, Social mobility and stratification. Concept of development, progress and social change.

Paper II: Paper Name – Contemporary Indian Society

To gain knowledge of Indian Society and Culture, village ,town , basic institution of Indian Society . Familial Problems and Social Problem.

B.A. II Subject Sociology Paper I: Sociology of Tribal Society

To understand tribal culture and society, classification of tribal people, socio- cultural profile, tribal sensitization, problems of tribal people.

Paper II: Paper Name – Crime and Society.

To understand various concept of crime, Social structure and anomie, Indian social problems, like drug, beggary, alcoholism etc, punishment , correctional process.

B.A. III Subject - Sociology

Paper I: Paper Name – Fundamental of Sociological thought

To understand the theory and concept of social thinker like August Kampte, Emile Durkheim, Karl Marx , Max Weber, Merton , Pareto and R.K.Mukharji

Paper II: Paper Name – Methods of Social Research.

To gain knowledge of research methodologies in sociology, techniques of data collection, tools and techniques of social research, social statistics.

DEPARTMENT OF COMMERCE PROGRAM OUTCOME

After completing bachelor program in Commerce, a student will be able to develop: 1. Critical Thinking: Develop the ability to completely evaluate new ideas, research findings in evaluation to business and commerce related issues. 2. Communication Skills: Ability to communicate ideas effectively in both written and oral formats develops communicate business analysis to the static holder and clean effective and appreciate manner. 3. Team Spirit: Work collaboratively and productively in group. 4. Social Responsibility: Recognize and understand the ethical and moral responsibility of the individuals and organization in society. 5. Global Citizen: Evolve into a global citizen who understands the duties for the welfare of our society and country.

6. Managerial Skills: Ability to complete knowledge into performance makes business decision through capability to interact and motivate and understand concept, develop ideas and implement strategies.

7. Employability: Prepare students for employment in various fields like chartered accountancy, company secretary, banking sector, business management etc.

PROGRAM SPECIFIC OUTCOME: COMMERCE

1. Knowledge of taxation and interest system. 2. Management and leadership quality. 3. Beneficial for employment such as banking, insurance, marketing, tax consultation, CA, CS, ICWA etc. 4. Beneficial for opting different choices of business and trades. 5. Knowledge of marketing such share, bonds, mutual funds, international marketing etc. 6. Determine cost price and selling price. 7. Helpful in statistical analysis such as data collection, investigation, tabulation, sampling and classification. COURSE OUTCOMES: B.Com.I Group I Paper I: Financial accounting: to impart basic accounting knowledge as applicable to business. Paper II: Business mathematics: To enable students to have minimum knowledge of mathematics as is applicable to business and economic situations. Group II Paper I: business communication: to develop effective business communication skills. Paper II: business regulatory framework: to provide a brief idea about the framework of indian business laws. Group III Paper I: Business environment: To acquaint the student with the emerging issues in business at the national and international level in the light of the policies of liberalization and globalisation Paper II: Business economics: To acquaint the students with the principles of business economics as are applicable in business. B.Com. II Group I Paper I: Corporate accounting: This course enables the students to develop awareness about corporate accounting in conformity with the provision of companies act. Paper II: Cost accounting: this course exposes the student to the basic concept and the tools used in cost accounting. Group II: Paper I: Principles of business management: this course familiarises the students with the basic of principles of management. Paper II: Company law this objectives of ths course is to provide a basic knowledge of the provisions companies act 1956, along with relevant case law. Group III Paper I: business statistics: it enable the students to gain understanding of statistical techniques as are applicable to business. Paper II: Fundamental of enterpreunship: It provides exposure to the students to the enterpreurial culture and industrial growth so as to preparing them to set up and manage their own small units. B.ComIII : Group I: Paper I: Income tax: To enable the

student to know the basic of income tax act and its implications. Paper II: Indirect Taxes and GST : This course aims at imparting basic knowledge about major indirect taxes. Group II Paper I: Management accounting: This course will provide the students an understanding of the application of accounting techniques for management. Paper II: Auditing: This course aims at imparting knowledge about the principles and methods of auditing and their application. Optional Group D: Money Banking and Insurance Area Paper I: Fundamental of Insurance: this course enables the students to know the fundamentals of insurance. Paper II: Money and Banking System: this course enables the students to know the working of the Indian money and banking system.

DEPARTMENT OF SCIENCE PROGRAM SPECIFIC OUTCOME:

B.Sc. After completing bachelor program in Science, a student will be able to develop: 1. Critical Thinking: The ability to gather and assess relevant information using abstract ideas to interpret it effectively. 2. Scientific Skills: Ability to understand scientific principles or concept and demonstrate scientific knowledge and skills in scientific reasoning. 3. Communication Skills: Develop oral and written skills to develop the communication, Ability to work productively on team projects with team spirit. 4. Social Adoptability: Inculcate values which provide guidelines for social conduct and social interaction, communication skills are the key to build a strong social support network. 5. Effective Citizenship: Develop into an ideal citizen who performs

the duties towards himself, family, society, community and towards the country. 6. Environmental Awareness: Borders understanding of current national and global environmental problem. 7. Ethics: Moral and ethical value are at the development of scientific temper of mind, capacity to think and judge about oneself. PROGRAM SPECIFIC OUTCOME OF BOTANY

Through seminar presentation students are made stage fear free and they become well versed in the topics assigned to them. Through phyto adoption program students are made aware of nurturing the plants. Through phyto art exhibition students improved their skill with respect to preparation of articles from plants and know about sustainable use of plants. The medicinal plantation developed by Botany Department has imparted knowledge regarding traditional and medicinal use of plants. Through field visits students are made aware of local flora. The students are made aware about the nature and learn vegetations and flora of different area COURSE

OUTCOMES: B.Sc.-I Subject: Botany Paper-I General Diversity of Microbes and Cryptogames 1. The student will acquire the knowledge of general diversity of microbes, algae, fungi, Bryophyte and Pteridophyta. Paper-II Cell Biology and Genetics. 1. Knowledge of cell, cell organelle, genetic material, gene expression and genetic variation. B.Sc.-II Subject: Botany Paper-I Diversity of seed plants and their systematics. 1. Diversity of gymnosperms and angiosperms. 2. Knowledge of Geological time scale and Fossils. Paper-II Structure, development and reproduction in flowering plants. 1. The vegetative and reproductive structure and development of angiosperms. B.Sc.-III Paper-I Plant Physiology, Biochemistry and Biotechnology. 1. To know the importance of plant water relation, nutrients, Photosynthesis, Respiration and other life supportive processes in plants. Paper-II Ecology and utilization of plants. 1. Knowledge about plants and environment and how plants are important and influence of our life.

Program: B.Sc. Microbiology

Program Specific Outcome: B.Sc. MICROBIOLOGY

- ☐ To Recognize various kinds of prokaryotic and eukaryotic microbes and their importance**
- ☐ To Explain and describe importance of biomolecules and their chemistry**
- ☐ To comprehend the importance of instruments and techniques in microbiology**
- ☐ To Understand concept of medical microbiology and Immunology**
- ☐ To Know the Environmental, Agricultural, Industrial insight of microorganisms**

Course Outcomes: B.Sc. Microbiology

B.Sc. Part I

Paper1 GENERAL MICROBIOLOGY AND BASIC TECHNIQUE

Upon successful completion of the course students will be able to –

CO 1: Learn history, development and fundamentals of microbiology

CO 2: Understand basic techniques to study microorganisms

CO 3: Get information about different branches of microbiology

CO 4: Acquire awareness about the life cycle of significant microorganisms

CO 5: Gain the knowledge of economic importance of microorganisms

Paper 2 BIOCHEMISTRY AND PHYSIOLOGY

Upon successful completion of the course students will be able to –

CO 1: Familiar with structure and functions of main building blocks of life

CO 2: Learn about structure, types and functions of DNA and RNA

CO 3: Know the role of catalysts in vital activities

CO 4: Get overview of microbial metabolism

CO 5: Grasp the mechanism of microbial growth and nutritional transport for growth

Lab Course B.Sc. Part I

Upon successful completion of the lab course students will be able to –

CO 1: Conversant with common laboratory tools and techniques of microbiology

CO 2: Understand the methods of obtaining microorganisms under lab conditions for

study

CO 3: Differentiate microorganisms on the basis of microscopic features

CO 4: Retain information regarding the properties of biochemical compounds and their

detection in biological system

CO 5: Study the production of enzymes and their role

B.Sc. Part II

Paper 1 MOLECULAR BIOLOGY AND GENETIC ENGINEERING

Upon successful completion of the course students will be able to –

CO 1: Trained with the fundamentals of molecular biology

CO 2: Understand the central dogma of protein synthesis

CO 3: Study the alteration, repair and regulation of gene

CO 4: Gain knowledge of genetic database

CO 5: Get approach of genetic modifications and its detection

Paper 2 BIOINSTRUMENTATION AND BIOSTATISTICS

Upon successful completion of the course students will be able to –

CO 1: Aware of different types of microscopes and their applications

CO 2: Understand the instruments used for separation and analysis of bio-molecules

CO 3: Acquainted with the molecular techniques

CO 4: Get an overview about the concept of biostatistics

CO 5: Know the methods of analysis of quantitative data

Lab Course: B.Sc. Part II

Upon successful completion of the lab course students will be able to –

CO 1: Understand the fundamental genetic properties of microorganisms

CO 2: Learn the genetic modification practices in microorganisms and their detection

CO 3: Perform the experiments based on analytical instruments

CO 4: Separate bio-molecules and study their properties

CO 5: Understand the behavior of genetic material under laboratory conditions

B.Sc. Part III

Paper I : MEDICAL MICROBIOLOGY AND IMMUNOLOGY

Upon successful completion of the course students will be able to –

CO 1: Study the air born and water borne diseases

CO 2: Learn about the clinical diagnosis diseases like cancer and diabetes

CO 3: Familiar with diagnostic techniques of important diseases

CO 4: Understand basic knowledge of immunity

CO 5: Acquire immunodiagnostic techniques

Paper 2: ENVIRONMENTAL, INDUSTRIAL AND AGRICULTURAL MICROBIOLOGY

Upon successful completion of the course students will be able to –

CO 1: Understand the basics of relation between environment and microorganisms

CO 2: Correlate different habitats of microorganisms

CO 3: Recognize microbial interactions in soil

CO 4: Know the industrial uses of microorganisms

CO 5: Aware of the agricultural importance of microorganisms

Lab Course : B.Sc. Part III

Upon successful completion of the lab course students will be able to –

CO 1: Understand the possible sources of microbial infections

CO 2: Accustomed with the immunogenic reactions

CO3: Isolation and characterization of agricultural and industrially important

microorganisms

CO 4: Recognize agricultural and industrial importance of microorganisms

Program Specific Outcome: M.Sc. MICROBIOLOGY

By the end of this program, the students will be able:

To give comprehensive understanding about the microbes, their organizational units

and

response towards environment

To inculcate the students to the knowledge of molecular characters and performance of

microorganisms

To develop capability of handling of instruments and to build inference for scientific

conclusions

To make the students approachable for problem solving skills and to introduce them

towards research aptitude

To create employable skills in the field of medical, food, Dairy and industrial

microbiology

To build the competency for use of knowledge in relation with environment

consciousness,

ethical values and socio-economical aspects

To be able to analyze problems involving microbes, articulate this with peers/ team

members/ other stake holders, and undertake remedial measures

M. Sc. Microbiology Semester I

MB101 BACTERIOLOGY AND VIROLOGY

After successful completion of course the students will be able to –

CO1: Learn the diversity among Bacteria and their respective forms

CO 2: Know about the classification and grouping of bacteria through diverse systems

CO3: Get an overview to the Viruses, Related agents and Bacteriophages and their organizations

MB102PHYCOLOGY AND MYCOLOGY

After successful completion of course the students will be able to –

CO 1: Know the diversity and life cycle of Eukaryotic Microorganisms

CO 2: Understand the importance and the life cycle patterns of major group of Algae and

Fungi

CO 3: Relate the knowledge of evolutionary relationship among fungal groups

CO 4: Get insight into useful fungal activities and importance of representative members

MB103 BIOMOLECULES AND ENZYMOLOGY

After successful completion of course the students will be able to –

CO 1: Learn the characters and classes of basic building blocks and their biological

significance

CO 2: Familiar the students with bio-molecular derivatives and their importance

CO 3: Study the structure, properties and biological importance of DNA and RNA

CO4: Understand conceptual knowledge of properties, structure, function of enzymes,

enzyme kinetics and their regulation

MB104 BIOLOGY OF IMMUNE SYSTEM

After successful completion of course the students will be able to –

CO 1: Know the concept of immune system and immunity and learn the methods of

immunogenic reactions

CO 2: Understand variety of operation related to immune response

CO 3: Conceptualize the origin of lymphocytic clones, the theory of immunization and

immune therapy

CO 4: Get an idea about tumor immunity, hypersensitive reactions and cytokines

MB105 LAB COURSE1

After successful completion of course the students will be able to –

CO 1: Identify the sources of Bacteria, Algae and Fungi for isolation under lab conditions

CO2: Study the cultural characteristics and morphological features of isolated

microorganisms

CO 3: Get acquainted with biochemical identification of bacteria

CO 4: Study the special features of Lichens, Cyanobacteria and Diatoms etc.

MB106 LAB COURSE2

After successful completion of course the students will be able to –

CO 1: Familiar with the different types of buffers and pH measurement

CO 2: Understand the quantification of biological molecules like Carbohydrates, Proteins

and Lipids

CO 3: Study the immunogenic reactions for identification of antigen - antibody response

CO 4: Recognize the idea of immune electrophoresis

M. Sc. Microbiology Semester II

MB201 INSTRUMENTATION

After successful completion of the course students will be able to –

CO 1: Understand the working of instruments for analysis of biological samples

CO 2: Comprehend different biophysical techniques for separation and purification of

biomolecules chromatography

C03: to study the importance and applications of spectroscopy, NMR, ESR and PCR

C04: study the importance and applications of Microscopy

MB202 BIOSTATISTICS

C01: Get the concept of biostatistics in microbiology and learn about basic measures to

compile the observation, analyze and make inference from observations

C02: To understand concept and importance Probability Analysis.

C03: To understand regression analysis and data validation tool

C04: Understand the correlation of obtained data and explain the significance of observations

and discrepancy in results during scientific experiments

MB203 MICROBIAL PHYSIOLOGY

After successful completion of course the students will be able to –

CO1: Understand the microbial photosynthesis mechanism and its ecological significance

C02: Gain knowledge of structure, biosynthesis cell wall composition, Degradation of

xenobiotic compound

C03: Understand the mechanism of methanogenesis, methylotroph and chemoautotrophs

C04: Acquainted with respiratory metabolic pathway, Pasteur effect and fermentation of

carbohydrates

MB204 MICROBIAL GENETICS

After successful completion of course the students will be able to –

CO 1: Understand the mechanism of damage and repair of DNA in living system

CO 2: Gain the knowledge of causes and consequences of alterations or modifications in

DNA structures

CO 3: Study the different ways of gene transfer in microorganisms

CO 4: Get an idea about the tools used in genetic analysis

MB205 LAB COURSE1

After successful completion of the course students will be able to –

CO 1: Understand the working of instruments for analysis of biological samples

CO 2: Comprehend different biophysical techniques for separation and purification of

bio molecules

CO 3: Assess the scientific data from literature data bases data validation and error

analysis.

CO 4: Apply the Statistical data tools for scientific validation

MB206 LAB COURSE2

After successful completion of the course students will be able to –

CO 1: Study different physiological factors on microbial growth

CO 2: Isolate DNA and RNA from different sources and their quantification

CO 3 get an idea about carbohydrate metabolism through microorganisms

CO4: Study the genetic expression in terms of antibiotic resistance, genetic transformation

M. Sc. Microbiology Semester III

MB301 MOLECULAR BIOLOGY

After successful completion of course the students will be able to –

CO 1: Understand molecular structure of DNA, its replication and inhibitors of DNA

replication

CO 2: Understand the significance of central dogma of gene action and understand the

molecular mechanisms involved in transcription and processing of RNA

CO 3: Gain knowledge of genetic code and molecular mechanisms in Protein synthesis

CO 4: Study and compare the regulation of gene expression in both prokaryotes and

eukaryotes

MB302 BIOENERGETICS AND METABOLISM

After successful completion of course the students will be able to –

CO 1: Get an overview of bioenergetics and understand the mechanism of anabolism and

catabolism

CO 2: Study the metabolism of important bio-molecules

CO3: Acquainted with respiratory metabolic pathway, Pasteur effect and fermentation

of carbohydrates

CO 4: Distinguish nitrogen metabolism and biosynthesis of polysaccharides

MB303 ENVIRONMENT MICROBIOLOGY

After successful completion of the course students will be able to –

CO 1: Understand the different branches of environmental microbiology

CO 2: Study the interactions of microbes in different environments

CO 3: Get idea about the role of microorganisms in their respective environments

CO 4: Make acquainted with the concept of microbial decomposition

MB304 INDUSTRIAL MICROBIOLOGY AND FERMENTATION TECHNOLOGY

After successful completion of the course students will be able to –

CO 1: Understand the history and scope of industrially important microorganisms

CO 2: Acquainted with the mechanism of strain improvement strategies

CO 3: Gain skill to deal with new ideas of modern fermentation techniques

CO 4: Get overview of different microbial products for commercial production

CO 1: Isolate and identify industrially important microorganisms

CO 2: Establish the standard method and scale up procedures for industrial production

of enzymes, antibiotics and ethanol

MB305 LAB COURSE 1

After successful completion of the course students will be able to

CO 1: Study the stages of cell cycle

CO 2: Isolate DNA and RNA from different sources and their quantification

CO 3: Separate polypeptides and their characterization

CO4: Study the genetic expression in terms of antibiotic resistance, genetic transformation

and transduction

MB306LAB COURSE 2

After successful completion of the course students will be able to

CO 1: Isolate microorganisms of eco-friendly attention

CO 2: Study the role and relation of microorganisms at different habitats

CO 3: Analyze the soil source as phosphate and nitrate supplying microorganisms

CO 4: Develop skill for water microbiological studies

M. Sc. Microbiology Semester IV

MB401 MICROBIAL BIOTECHNOLOGY

After successful completion of the course students will be able to –

CO 1: Learn about core techniques and cloning vectors used in rDNA Technology

CO 2: Estimate different strategies used for genetic manipulation

CO3: Study the sequential steps of genetic modification and understand genetically

modified organisms and their impact on environment

CO 4: Gain the knowledge of rights, ethical issues and safety aspects about microbial

biotechnology

MB402 MEDICAL MICROBIOLOGY

CO 1: Get an overview of discovery and development of medical microbiology and

understand the infectious diseases

CO 2: Study the classification of different disease-causing agents like bacteria, viruses,

fungi and protozoa with examples of some common diseases

CO 3: Learn the diagnostic skills for infectious diseases

CO 4: Recognize the measures taken for control of diseases through different systems

MB403 FOOD AND DAIRY MICROBIOLOGY

CO1: Understand the procedure of isolation and identification of microflora from

different body parts and fluids

CO 2: Study different food materials as substrates for microorganisms and the methods

for detection of food spoilage by microorganisms

CO 3: Evaluate the mechanism for microbiological examination of fresh and preserved

food

MB404 AGRICULTURE MICROBIOLOGY

After successful completion of the course students will be able to –

CO 1: Understand the habitat of microorganisms with reference to Agriculture

CO 2: Familiar with the plant pathogenic characters of microorganisms

CO 3: Know the degradation and toxic effects of microorganisms for plants

CO 4: Study positive effects of microorganisms in terms of Agriculture

MB405 LAB COURSE 1

After successful completion of the course students will be able to –

CO1: Isolate DNA and RNA from different sources and their quantification

CO 2: Isolation and purification of microbial protein.

CO 3 Understand the procedure of isolation and identification of microflora from

different body parts and fluids

CO4: Study the genetic expression in terms of antibiotic resistance, genetic transformation

and transduction

MB406 LAB COURSE 2

After successful completion of the course students will be able to –

CO1: CO 2: Study different food materials as substrates for microorganisms and the

methods for detection of food spoilage by microorganisms

CO 3: Microbiological examination of fresh/ preserved /spoiled food

CO 4: Study the plant diseases and evaluate agricultural importance of microorganisms

**PROGRAM SPECIFIC OUTCOME OF B.Sc. CHEMISTRY :
LEARNING OUTCOME OF CHEMISTRY**

Scientific reasoning and qualitative and quantitative analysis.

Students learn the way in which new scientific knowledge is created. They will know how

chemists interpret chemical and physical phenomena through experimental investigation.

Chemical information and literature skills. Knowledge about the different chemicals we use in our daily life.

Impact and applications. Students will understand how chemical principles are applied to current problems in a variety of fields.

B.Sc. PART I

PAPER I INORGANIC CHEMISTRY

Upon successful completion of the course students would be able to

UNIT I-Explain structure of atoms, shape of s, p,d and f orbital's, quantum numbers, electronic configuration of elements and wave mechanical concept. general idea of de-Broglie matter waves, uncertainty principle ,periodic properties and trends of periodic properties in the periodic table and also predict and explain the chemical behavior of elements.

UNIT II- Explain the ionic bonding in solids, calculating lattice energy. Dipole moment and covalent character in ionic compounds.

UNIT III -To explain covalent bonding in compounds, Valence bond theory, Valence shell electron pair repulsion theory(VSEPR), Shape of molecules, general idea of hybridization and molecular orbital theory.

UNIT IV-General concept of S and P block elements, their compounds and chemical properties in periods and groups.

UNIT V-General idea of Noble gases and theoretical principles involved in qualitative analysis.

PAPER II ORGANIC CHEMISTRY

UNIT I-To understand the basics of organic chemistry, hybridization, different effects on electronic displacement and their application, reaction intermediates and types of organic reactions.

UNIT II- To introduce terminologies of stereochemistry of molecules , configuration and projection formulae and different type of nomenclatures of geometrical isomers.

UNIT III-To explain conformation of alkanes, cyclohexanes and sugars, relative stability of cyclohexanes, disubstituted cyclohexanes and baeyer strain theory.

UNIT IV-To explain chemistry of alkanes , alkenes and alkynes. Chemical reactions of alkanes, alkenes and alkynes and their mechanisms.

UNIT V-To know the aromatic character and aromatic compounds and reactions mechanism of aromatic compounds and directive effect of groups.

PAPER III PHYSICAL CHEMISTRY

UNIT I-To improve basic mathematical concepts involved in chemistry.

UNIT II- To explain gaseous state, different properties of gases. Ideal behavior of gases, real gas and deviation from ideal gas behavior and different isotherms.

UNIT III-To explain liquid state of matter and type and properties of colloids. Surface chemistry and discussion of different theories related to surface chemistry.

UNIT IV-To explain solid state , crystal lattice and different methods for the determination of structure of solids.

UNIT V-To describe the rate of reaction , order of reaction, determination of order of reaction, theories related to describe the mechanism of reaction and general idea about catalysis.

B.Sc. PART II

PAPER I INORGANIC CHEMISTRY

After the successful completion of the course student would be able

UNIT I- To describe transition series elements. Position, general characters electronic

configuration different oxidation States and magnetic properties of D block elements

UNIT II- to describe oxidation and reduction redox potential

electrochemical series coordination

compounds and stereochemistry of 4 and 6 coordination numbers

UNIT III - to explain valence bond theory and crystal field theory of coordination compounds

Calculation of Crystal Field stabilization energy

UNIT IV- to describe chemistry of lanthanides and actinides occurrence and isolation of

Lanthanide and actinides and similarities between them.

UNIT V- general idea of different theories related to acids and this is and non aqueous solvents

PAPER II- ORGANIC CHEMISTRY

UNIT I- To describe chemistry of alkyl and aryl halides and different reaction mechanisms

involved in alkyl and aryl halides and relative reactivity of different halides.

UNIT II- to describe nomenclature preparation properties and different reactions of alcohols and phenols

UNIT III - to explain structure nomenclature reactivity and different chemical reactions of aldehydes and ketones

UNIT IV- to explain preparation structure bonding physical and chemical properties and acidity of carboxylic acids and carboxylic acid derivatives

UNIT V- to describe nitroalkanes and nitroarance and reactivity structure nomenclature physical properties stereochemistry and basicity of alkyl and arail amines.

PAPER III PHYSICAL CHEMISTRY

UNIT I- to explain different terminology of basic thermodynamics zeroth law and first law of thermodynamics general idea about heat work internal

energy and heat capacities and joule Thomson effect to explain thermochemistry of different reactions

UNIT II- to explain the second law of thermodynamics, Carnot cycle, entropy, change in entropy, Physical significance of Entropy Gibbs and Helmholtz free energy and elementary idea of third law of thermodynamics.

UNIT III- to explain chemical equilibrium of reactions, dependence of equilibrium constant on temperature, pressure and concentration, relations between various equilibrium constants, general idea of pH, common Ion effect, salt hydrolysis, buffer solutions and solubility and solubility product.

UNIT IV- to describe phase rule, Clausius Clapeyron equation and its application, different component systems and Nernst distribution law.

UNIT V - general idea of electromagnetic radiation, Beer Lambert law, law and theories related to photochemistry and difference between thermal and photochemical processes low and high Quantum yield.

B.Sc. PART III

After the successful completion of course student would be able

PAPER I INORGANIC CHEMISTRY

UNIT I - to understand limitations of valence bond theory and crystal field theory, application of Crystal Field stabilization energy, to describe Thermodynamics and kinetic aspects of metal complexes.

UNIT II- to understand magnetic behaviour and magnetic susceptibility and electronic spectra of transition metal complexes.

UNIT III- to explain classification of organometallic compounds concept of hapticity and 18 electron rule, general methods of preparation and catalysis by organometallic compounds.

UNIT IV- general idea of chemistry of bioinorganic compounds and biological role of alkali and alkaline earth metals, structure of hemoglobin and myoglobin.

UNIT V- basic idea of hard and soft acids and bases, type and application of inorganic polymers.

PAPER II -ORGANIC CHEMISTRY

UNIT I- to explain nomenclature, structure aromaticity and different methods of preparation of heterocyclic compounds.

UNIT II- to discuss formation, structure and different chemical reactions of organometallic reagents, organic synthesis via enolates.

UNIT III- to describe classification, configuration, determination of ring size of biomolecule (carbohydrates), classification and nomenclature of amino acids, general idea of DNA, RNA and double helical structure of DNA.

UNIT IV- to explain chemistry of polymerisation, types of polymers, classification of dyes and different types of dyes.

UNIT V- to explain basic principles involved in different spectroscopy infrared Spectroscopy, UV visible and NMR spectroscopy.

PAPER III PHYSICAL CHEMISTRY

UNIT I- To explain basic theories, postulates of quantum mechanics, schrodinger wave equation and its application.

UNIT II- To explain quantum mechanical approach of Molecular orbital theory valence bond theory huckel theory and its application.

UNIT III- to describe general principles of different physical spectroscopy techniques like vibrational spectroscopy, Raman spectrum electronic spectroscopy and application of different Spectroscopy techniques.

UNIT IV- to explain basic terminology used in electrochemistry different theories of electrochemistry.

UNIT V- to explain different electrochemical cell ,galvanic cells, different electrodes and application of electrochemistry.

Lab course

After the completion of lab courses student would be able

B. Sc. I

To Semimicro analysis, acid base titration, redox titration, demonstration of laboratory equipment , distillation , crystallization, surface tension measurement, viscosity measurement and calculating the rate of different reactions.

B. Sc. II

To semimicro analysis, chromatography, detection of elements, preparation of organic compounds. Determination of transition temperature.

B. Sc. III

To semimicro analysis, detection of functional groups, detection of specific compounds, spectrophotometry.

Program Specific outcome of zoology

1. Exposure to diversity in animal groups and applied zoology .
2. Critical thinking:- The curriculum helps to enhance the ability and thinking power of student .
3. Effective communication acquire communication skill through debates , seminar , presentations.
4. Ethics :- Students learns ethical approach to conserve diversity of animal kingdom

5. To inculcated good laboratory practices in students and to train them about proper handling of lab instruments.

PAPER - I . cell biology and non chordata

Course outcomes :-

Bsc -1st , sub - zoology

2. Knowledge of cell , cell organelles and its functions and compare between prokaryotic and Eukaryotic cell

1. To explain origin of life and their gradual development

4.To explain identification and classification of invertebrate animal

5. To understood the systematic position, habit and habitat, morphology and various system of types of animal from each phylum of invertebrate.

3.To understood cancer cell and causes and their diagnosis and way to avoid them.

Paper -II Chordata and Embryology

1. Studied the identification and classification of chordata animals

2. To explain poisonous and non poisonous snake and way to

avoid their snake bites , got detailed information about different types of snake found in india .

3. To know the process of differentiation, oogenesis , spermatogenesis , placenta in mammals.

4. Learned about the need for migration in fishes and birds

Lab course :-

1. Classification and identification of various types of specimen , microscopic study of different stages of chick embryo.

2. Recognize the importance of conservation

Bsc - 2nd , sub - zoology

Paper -I Anatomy and physiology

1. Learned about the structure and functions of skin found in different animals

2. Knowledge gain about the respiratory system , study of the respiratory system found in different animals like - gill , lung , Air sac

3. understood the speciality of kidney , heart , brain , nervous system, spinal cord

Paper - II vertebrates endocrinology ,

Reproductive behavior , evolution and Applied Zoology

1. To gain knowledge of the distribution , morphology of endocrine gland , their role in chemical integration , phyletic distribution of the hormones will be understand.
2. To gain information about biosynthesis of various hormones and understand the metabolic disorders concern with them
3. Students pursuing this course should have detailed studies of the various discipline of the zoology subject and other branches of zoology such as animal physiology , non -chordata and chordata , biological evolution , endocrinology , applied zoology , genetics
4. The practical course intends to inform students about animal systematic, animal diversity , applied zoology fields such as a fishries, apiculture, aquaculture, sericultre, prawn culture

Lab course :-

1. Classification and identification of various types of specimen
2. To understand the life cycle of honey bee and silk worm and its identification
3. To understand the scope of aquaculture , know about the

environmental influence and ecological aspects of behavior

Program Specific Outcome (PSO) of UG

Botany course deals with the scientific study of the plants, algae and fungi.

PSO1: A student completing the course is able to understand different branches of Botany such as

systematics, evolution, ecology, developmental biology, physiology, biochemistry, plant

interactions with microbes and insects, morphology, anatomy, reproduction, genetics and

molecular biology of various life-forms.

PSO2: They become competent enough in various analytical and technical skills related to

plant sciences

PSO3: The course is a vast combination of studying from the basic cell structure to the workings

and metabolism of plants on higher levels including their evolution.

PSO4: Students gain skills and knowledge, which they can apply to do the botanical research and

findings in areas such as Agriculture, Forestry, Horticulture, Plant Breeding, etc

PSO5: Course also provides a hands-on experience to the students in understanding the

scientific concepts through practical knowledge.

Course Outcome of B.Sc. Botany

B.Sc. Part -I

Paper I Bacteria, Viruses, Fungi, Lichens and Algae

On completion of the course, students are able to:

CO 1: To Learn classification, characteristics, nature life cycle about viruses

CO 2: To Learn the characteristics, identification and cultural methods of Rhizobium, Azotobacter and Anabaena.

CO 3: Understand the Biodiversity and economic importance of Fungi

CO 4: Understand the diversity, Morphology and economic importance among Algae

CO 5: Understand the diversity, economic importance of Lichen and mushroom Cultivation

Paper II: Bryophytes, Pteridophytes, Gymnosperms and Paleobotany

On completion of the course, students are able to:

CO1: Understand the morphological diversity and economic importance of Bryophytes.

CO 2: Understand the morphological diversity, life cycle and economic importance

Pteridophytes. CO 3: Also, they will know about Azolla as a biofertilizer.

CO 4: Know the evolution, diversity, morphological, anatomical structure and economic importance of Gymnosperms.

CO 5: They will be able to understand about geological time scale and fossil plants

B.Sc. Part -II

Paper I: Plant Taxonomy, Economic Botany, Plant Anatomy and Embryology

CO 1: Understanding of the students about the Identification, Nomenclature and their classification including recent advances in the field.

CO 2: Learn about the characters of biologically important families of angiosperms.

CO 3: The students will learn about the economic value of plant sources of cereals, legumes, spices, oil, rubber, timber and medicines.

CO 4: Understand the normal and anomalous secondary growth in plants and their causes and scope & importance of Anatomy.

CO 5: Know the application of Embryogenesis, Palynology and Experimental embryology.

Paper II: Ecology and Plant Physiology

CO 1: Understand about plants and environment and familiar with community ecology and ecosystem.

CO 2: Students will be able to understand the concept of ecosystem, food web, food chain, concept of ecological pyramid and biogeochemical cycle.

CO 3: Understand the application of vital and physical forces theories on plant physiology most preferably ascent of sap, transpiration, mineral nutrition in plants and phloem transport.

CO 4: Students will be able know about Introduction and explanation of Photosynthesis, photorespiration and respiration.

CO 5: Understand the role of plant growth regulators in plants and physiology of flowering, seed dormancy.

B.Sc. Part -III

Paper- I: Analytical Technology Plant Pathology, Experimental Embryology, Elementary

Biostatistics and Environmental Pollution and Conservation

CO 1: Students will be able to understand principles and applications of analytical instrumentation.

CO 2: Understand the plant tissue culture techniques and application and also know the analytical techniques.

CO 3: Understand the scope and importance of Plant Pathology and also know the prevention and control measures of plant diseases and its effect on economy of crops.

CO 4: Learn about conservation of biodiversity, endemic species, red data book, concept of sustainable development and phytoremediation techniques.

CO 5: Understand the application of various biostatistical tools are used in applied research.

Paper II: Genetics, Molecular Biology, Biotechnology and Biochemistry

CO 1: Understand the plant cell structure, cell wall structure plasma membrane and specialized plant

cell type, Mendel's laws, gene concept and morphology of chromosome.

CO 2: Understand the biochemical nature of nucleic acids, their role in living systems, experimental evidences to prove DNA as a genetic material and process of synthesis of proteins and role of genetic code in polypeptide formation.

CO 3: Gain knowledge about the mechanism and essential component required for prokaryotic DNA replication and understand the fundamentals of Recombinant DNA Technology.

CO 4: Understand the protein, Carbohydrate, fat- structure and classification and biosynthesis in

prokaryotes and eukaryotes. They will also learn Significance of Carbohydrates and understand the Properties of saturated fatty acids, and unsaturated fatty acids.
CO 5: Student will get the nomenclature, classification, components enzyme, theories and enzyme kinetics.

Lab Course 1:

CO 1: Students will be able understand the internal and external morphology of vascular and non vascular plants.

CO 2: Familiarize with the basic skills and techniques of botany.

Lab Course 2:

CO 1: Understand the different characteristic of plants like Cucurbitaceae, Apiaceae, Rubiaceae, Asteraceae, Asclepiadaceae, Acanthaceae and Lamiaceae, including monocotyledonous families.

CO 2: Understand the classification of plant tissues with a brief account on Dicot secondary growth and Anomalous Secondary growth.

CO 3: Understand the process of photosynthesis and respiration in higher plants.

Lab Course 3:

CO 1: Student will be able to understand the host relation of plant disease and also develop skill about preparation of various types of culture medium, instrumentation techniques.

Program Specific Outcome of M.Sc. Botany

PSO 1: Understanding the classification of plants from cryptogams to Spermatophyte. Identification of

the flora in field. Study of biodiversity in relation to habitat correlate with climate change, land and forest degradation.

PSO 2: Application of Botany in agriculture through study of plant pathology. Paleobotany to trace the evolution of plants.

PSO 3: Understand the ultrastructure and function of cell membranes, cell communications, signaling, genetics, anatomy, taxonomy, ecology and plant Physiology and biochemistry. To understand the multi functionality of plant cells in production of fine chemicals. There wide spread industrial applications.

PSO 4: Molecular and Physiological adaptations in plants in response to biotic and abiotic stress.

Genes responsible for stress tolerance genetic engineering of plants.

हिन्दी विभाग

विशिष्ट अधिगम परिणाम (Programme Specific Outcomes)

बी.ए./बी.एस.–सी./बी.कॉम.प्रथम वर्ष (हिन्दी भाषा)

1. विद्यार्थी में रचनात्मक लेखन का विकास होगा।
2. व्याकरण एवं मानक भाषा का प्रयोग के साथ परिष्कृत हिन्दी लेखन शैली होगी।
3. देवनागरी लिपि की वैज्ञानिकता एवं कम्प्यूटर में हिन्दी अनुप्रयोग से परिचित कराना।

4. हिन्दी साहित्य के प्रति रूचि जागृत हो सकेगी।
5. भारतीय समाज की विभिन्न कालों में संक्षिप्त जानकारी हो सकेगी।

बी.ए./बी.एस.–सी./बी.कॉम.द्वितीय वर्ष

1. विद्यार्थियों के सम्भाषक कुशलता में विकास होगा।
2. स्वतंत्रता सेनानियों एवं महापुरुषों के कार्यों से अवगत हो सकेंगे।
3. कार्यालयीन भाषा लेखन के कौशल में विकास होगा।
4. हिन्दी की व्याकरणिक कोटियों का ज्ञान होगा।

बी.ए./बी.एस.–सी./बी.कॉम.तृतीय वर्ष

1. कथन की शैलियों की जानकारी प्राप्त होगी।
2. कार्यालयीन पत्र और आलेख के प्रारूप एवं लेखन शैली में विकास होगा।
3. विद्यार्थियों में हिन्दी साहित्यकारों की रचनाओं का पठन-पाठन में रूचि जागृत होगी।
4. विभिन्न प्रकार के पत्र लेखन शैली में विकास होगा।

बी.ए. प्रथम वर्ष (हिन्दी साहित्य)

प्रथम पत्र का नाम – प्राचीन हिन्दी काव्य

1. मध्यकालीन साहित्य से आरंभिक परिचय विद्यार्थी प्राप्त कर सकेंगे।
2. मध्यकालीन काव्य लेखन के समस्त काव्य भाषा से परिचित हो सकेंगे।
3. भाषा, संस्कृति, विचार, मानवता, काव्यरूपता, लौकिकता पारलौकिकता आदि का अध्ययन कर सकेंगे।

द्वितीय प्रश्न पत्र – हिन्दी कथा साहित्य

1. हिन्दी में कहानी विधा के स्वरूप का ज्ञान और उसके सौंदर्य का आस्वाद प्राप्त कर सकेंगे।
2. कथा साहित्य के प्रति विद्यार्थियों में रूचि विकसित करना।
3. कथा के माध्यम से जीवन की अनुभूतियां, संवेदनाओं तथा विविध परिस्थितियों के साक्षात्कार के लिये उपयोगी सिद्ध होगा।
4. प्रेमचंद के आख्यान कौशल और उनकी सामाजिक संवेदनशीलता से परिचित हो सकेंगे।

बी.ए. द्वितीय वर्ष (हिन्दी साहित्य)

प्रथम पत्र का नाम – 'अर्वाचीन हिन्दी काव्य'

1. विद्यार्थी आधुनिक काव्य विकासक्रम से अवगत हो सकेंगे।

2. स्वतंत्रता प्राप्ति के पूर्व की भाव-भाषा, शिल्प, अंतर्वस्तु संबंधी समस्त विकास धारा से अवगत हो सकेंगे।
3. छायावादोत्तर काव्य के राष्ट्रवादी स्वर को समझने में सहायता मिल सकेगी।
4. प्रसिद्ध साहित्यकारों की कविताओं का ज्ञान अर्जित कर सकें।

द्वितीय प्रश्न पत्र – हिन्दी निबंध तथा अन्य गद्य विधाएं

1. हिन्दी गद्य विधा के वैचारिक और सौंदर्यात्मक पक्ष से परिचित हो सकेंगे।
2. हिन्दी निबंध के स्वरूप और सौंदर्य से परिचय एवं जानकारी प्राप्त कर सकेंगे।
3. हिन्दी एकांकी के विषय में आरंभिक ज्ञान प्राप्त कर सकेंगे।
4. गद्य साहित्य के प्रति रुचि विकसित होगी।

Program Name: B.A. / B.Com. /B.Sc. (Foundation Course II)
Programme Specific Outcomes (PSOs): B.A. English Literature

- **Acquaint the students with Representative writers and their works.**
- **Acquaint the students with Modern writers and their works**
- **Acquaint the students with Indian writers and their works**
- **Acquaint the students with American writers and their works**

Course Outcomes of English Literature

B.A. PART I

ENGLISH LITERATURE - PAPER I

On completion of the course students will be able to -

- 1. understand the four genres of English Literature**
- 2. understand the literary movements and the great historical events that affected literature of that time**
- 3. understand Human values, Professional ethics, Environmental and Gender issues**

Course Outcomes of English Literature

B.A. PART I

ENGLISH LITERATURE - PAPER II

On completion of the course students will be able to -

- 1. understand the four genres of English Literature**
- 2. understand the literary movements, the trends and tendencies that occurred in English**

Literature and affected the history of the nation

- 3. understand Human values, Professional ethics, Environmental and Gender issues**

Course Outcomes of English Literature

B.A. PART II

ENGLISH LITERATURE: PAPER I

On completion of the course students will be able to -

- 1. understand the Modern English literature, literary trends and tendencies of the age**
- 2. know the usage of the figures of speech**
- 3. understand Human values, Professional ethics, Environmental and Gender issues**

Course Outcomes of English Literature

B.A. PART II

ENGLISH LITERATURE : PAPER II

On completion of the course students will be able to -

- 1. understand the Modern English literature, literary trends, tendencies and historical events of the age.**
- 2. know the usage of the figures of speech**
- 3. understand the War poets and their works.**
- 4. understand Human values, Professional ethics, Environmental and**