

**OFFICE OF THE INTERNAL QUALITY ASSURANCE CELL  
LILONG HAOREIBI COLLEGE  
LILONG USOIPOKPE THOUBAL, MANIPUR – 795130**



**PROGRAMME OUTCOME, PROGRAMME SPECIFIC OUTCOME AND COURSE  
OUTCOME**

Lilong Haoreibi College has altogether a total of fourteen (14) departments in both Science and Arts streams combined, offering Seventeen BA/BSc Under-Graduate (Hons.) Degree programmes. Each programme has got six semesters and students are awarded BA/BSc Degree by the affiliating University i.e., Manipur University (MU) after successful completion of all the six semesters.

Manipur University prescribes the syllabus and curriculum of various BA and BSc undergraduate programmes that it offers to its affiliated colleges. However, it does not provide a common Programme Outcome (PO), Programme Specific Outcome (PSO) and Course Outcome (CO) for these programmes and courses offered in different colleges. Therefore, Lilong Haoreibi College has constituted an ad-hoc committee with the Principal as Chairperson and HOD of all the departments as members to draft PO, PSO and CO of various programmes and courses it offers to the students and upload in the college website. After the PO, PSO and CO of all the subjects are drafted, these are submitted to IQAC of the college for crisscross checking with the committee and thus finalised jointly.

The main objective of preparing these outcomes is that it gives/enables the students to know about the programmes and courses that are offered in the institution and make their choice of the programmes/courses judiciously and wisely.

The Bachelor of Arts (BA) Degree programs provide students with fundamental knowledge in the areas of study chosen, equips the students with knowledge on social, cultural, ethical, economic, political and historical issues, and how this knowledge could influence and impact the human civilization in the past as well as the present.


Bachelor of Science (BSc) enables the students to have fundamental knowledge in a variety of Science subjects. It inculcates them with theoretical and practical knowledge in different disciplines of science, critical and analytical thinking as well as systematic approach to problem solving.

In either case, a bachelor's degree is the key that unlocks the door to a world of career options and development. It is therefore necessary to highlight the various intended outcomes of the various programmes and courses offered in the institution. These are wrapped up below one after another following alphabetical order:

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**NAME OF PROGRAMME: BOTANY**



**Programme Outcome (POs):**

**PO1:** Understand the range of plant diversity in terms of structure, function and environmental relationship in different plant communities

**PO2:** Familiarize the role of plants in the functioning of global ecosystem and also thinking of logically an organize task into a structural forms

**PO3:** Learn the practical skills to carry out the work in the field and in the laboratory with minimal risk like interpreting plant morphology, anatomy, plant identification and vegetation analysis by using different techniques

**PO4:** Understand the impact of plant diversity in social and environmental contexts and demonstrate the knowledge and need of sustainable development along with applying ethical principal and commit to environmental ethics and responsibilities and norms of biodiversity conservation

**PO5:** Understand the utilization of Indigenous plant species from natural resources which may be helpful in various purposes in the form of food plants, aromatic and medicinal values for the economy of human welfare in future generation

**Program Specific Outcome (PSO):**

**PSO1:** Comprehend the basic concepts of plant ecology, taxonomy and botanical nomenclature and analyze the characters of different plant community.

**PSO2:** Understand the concepts and role of microbes in industry, environment and agricultural practices.

**PSO3:** Comprehend different fundamental concepts related to plant biochemistry like plant cell organelles, physiology, respiratory, lipid metabolism etc.

**PSO4:** Understand different causes of environmental pollution and their remedies.

**PSO5:** Develop their competency on different types of plant tissue culture.

**PSO6:** Recall the history of reproductive biology of Angiosperm and understand structure, function of anther wall and pollen.

**PSO7:** Understand the fundamental concept of Phytochemistry, concept and scope of plant biodiversity, various micro technique use in Botany

**PSO8:** Learn about the importance of foreignsic investigation through pollen and oil exploration from pollen or spores of plants.

**PSO9:** Analyze the interactions between plants and pathogen/fungi bacteria or virus and also the interaction between plants and non-pathogenic symbiotic bacteria and fungi.

**PSO10:** Understand different concepts relation to ecological and social dimension for sustainable development

**Course outcome (CO):**

**SEMESTER – I**

**Course Code: BOT-101**

**Course Name: Botany – I (Virus, Bacteria and Cryptogams)**

After completion of this course, students will be able to

**CO1:** Describe the structure, components, classification of virus, nomenclature and viral replication (MV)

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- CO2:** Discuss the general characters of cell organization and different types of nutrition
- CO3:** Explain the general characters, classification, reproduction, life-cycles with economic importance of fungi
- CO4:** Identify the structure of Lichens, reproduction and economic importance
- CO5:** Analyze the concept, classification, causes and control measures of plant diseases with pattern of management
- CO6:** Explain the life cycles of algae and their economic importance
- CO7:** Describe the morphology and life cycles of bryophytes and pteridophytes and demonstrate the microscopic studies in their vegetative and reproductive structures included in the syllabus

## **SEMESTER – II**

**Course Code: BOT-202**

**Course Name: Botany – II (Gymnosperms, Angiosperms, Applied Botany and Embryology)**

On completion of this course, students will be able to

- CO1:** Explain the classification, morphology, respiratory and life-cycles of Gymnosperms with their economic importance
- CO2:** Discuss and identify the fossil plants on the basis of geological era
- CO3:** Learn about the importance of Plant Taxonomy
- CO4:** Popularize the cultivation and improvement of food plants in terms of cereals, beverages, medicinal and timber yielding plants
- CO5:** study the ethno-botanical concepts, classification and interdisciplinary approaches
- CO6:** Describe the different anatomical plant tissues and demonstrate the microscopic observation in anomalous secondary growth.
- CO7:** Understand the development process of embryo and endosperm
- CO8:** Study the morphology of pollen and spore as an allergen in the field of aerobiology

## **SEMESTER – III**

**Course Code: BOT-303**

**Course Name: Botany – III (Plant geography, Ecology, Plant physiology & Molecular biology)**

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

- CO1:** Explain the scope and importance of phytoecogeographical regions of India
- CO2:** Explain the concepts of Ecosystem, structure, function and different trophic level of food chain
- CO3:** Determination of frequency, density of vegetation in a community by using Quadrat method
- CO4:** Understand the mechanism of various physiological process related plant physiology and biochemistry to plants life

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**CO5:** Understand the role of structure and importance of the biomolecules.

**CO6:** Make the students realize the importance of all physiological process which takes place in plants

**CO7:** Acquire basic knowledge needed for proper understanding of plant functioning

**CO8:** Familiarize with the basic skills and techniques related to plant physiology and bio-chemistry

**CO9:** Demonstrate the extraction of chlorophyll pigments from leafy parts by Chromatographic technique

**CO10:** Isolation of DNA from plant seedlings

#### **SEMESTER – IV**

**Course Code: BOT-404**

**Course Name: Botany – IV (Cytogenetics, Biotechnology and Biometrics)**

After completion of this course, the students will be able to

**CO1:** Describe the organization and function of cell and its components and study the different stages of cell division with their significance.

**CO2:** Imparting an insight into the principles of heredity, pattern of inheritance in different organisms.

**CO3:** Describe the inheritance pattern of nuclear and extra-nuclear, gene interaction in plants.

**CO4:** Study the knowledge of breeding behavior use different methods for crop improvement.

**CO5:** Understand the importance of horticulture in human welfare.

**CO6:** Learn about the basic aspects of tissue culture application of plant biotechnology in medicine, agriculture and human welfare.

**CO7:** Help the student in apply statistical methods in biological studies

#### **SEMESTER – V**

**Course Code: BOT-505**

**Course Name: Botany – V (Microbial diversity, Plant pathology and Embryophyta)**

After completion of this course, students will be able to

**CO1:** Describe the Microbial diversity and importance of microbiology in soil, air and water.

**CO2:** Explain the role of microbes in human welfare and benefits in industry, agricultural food and medical microbiology

**CO3:** Discuss the various plant diseases and control measures and also demonstrating the symptoms, causal organisms and microscopic studies of diseased plants.

**CO4:** Understand the various method of disease management

**CO5:** Explain the evolutionary trends and the economic importance of Bryology and Pteridology and also describing the comparative study of morphological and anatomical structures.

**Course Code: BOT-506**

**Course Name: Botany – VI (Advanced Plant Taxonomy, Anatomy, Embryology and Palynology)**

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After completion of this course, students will be able to

**CO1:** Explain the concept of Progymnosperms and diversity among Gymnospermic plants.

**CO2:** Describe the primitive fossil plants for the exploration of fossil fuels.

**CO3:** Describe the details of advanced plant taxonomy and different methods and techniques of herbarium preparation.

**CO4:** Understand the development of modern taxonomy in terms of scientific methods for the application of biochemical and DNA markers in taxonomic studies.

**CO5:** Study the role of botanical survey of India, system of classification and economic importance of different plant families

**CO6:** Learn about the management and utilization of plant resources in various practices for the benefit of human welfare.

**CO7:** Discuss the histological theories of anatomy of angiospermic plants.

**CO8:** Define plant Embryology and describe the development, structure and function of endosperm, types of embryo in both monocot and dicot plants.

**CO9:** Understand the role of pollen in plant taxonomy and for the application of palaeopalynology, melisso-palynology and forensic palaeopalynology

**Course Code: BOT-507 (P)**

**Course Name: Botany – VII - Practical Based on Theories of Papers 505 and 506**

On completion of this course students are expected to be able to perform practical of the theories of paper 505 and 506 of Botany (Hons.) programme.

**SEMESTER – VI**

**Course Code: BOT-608**

**Course Name: Botany – VIII (Ecology, Plant physiology and Molecular Biology)**

After completion of this course, students will be able to

**CO1:** Study the different types of vegetation and importance of natural resources for implementing the sustainable development and conservation.

**CO2:** Explain ecosystem and pollution, types of environmental pollution and control measures.

**CO3:** Know about the causes of climate change and global warming in the environment.

**CO4:** Understand the concept of biodiversity and its significance.

**CO5:** Explain the physiological role of microbes and macro elements, deficiency symptoms, phases of growth, plant hormones with their physiological functions.

**CO6:** Learn about the absorption of mineral, translocation and relation in growth and development in plants.

**CO7:** Discuss the principles of biophysical chemistry, bioenergetics and enzyme regulation.

**CO8:** Know the process of photosynthesis, application and its significance

**CO9:** Learn about the genomic organization, fundamental DNA technology, genetic engineering, the concept of operon and its structure and regulation.

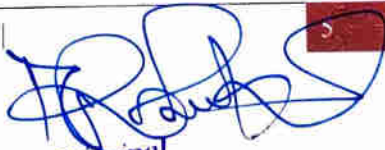
**CO10:** Know about the nitrogen metabolism and its impact.

**CO11:** Learn about the biosynthesis of carbohydrates, fatty acids, protein and its utilization

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**Course Code: BOT-609**

**Course Name: Botany – IX (Cell biology, Genetics, Plant breeding, Biotechnology and Computer Application)**

After completion of this course, students will be able to

- CO1:** Discuss the historical background of cell theory and comparative account of prokaryotic and eukaryotic cells, concept of operon and its gene regulation
- CO2:** Understand the cell organization and its ultrastructure and the interaction amongst the allele
- CO3:** Study the technique of production of superior crops and the role in human welfare for economy
- CO4:** Understand concept of habitation, niche and mechanism among living organisms
- CO5:** Understand the diversity of plants, the taxonomic position and systematic
- CO6:** Learn about the biosynthesis of carbohydrates, fatty acids, protein and its utilization
- CO7:** Understand concept of habitation, niche and mechanism among living organisms
- CO8:** Understand DNA technology and its importance to human welfare and the interaction amongst the allele
- CO9:** Understand biotechnology and its application by using different techniques for the development in the field of multidisciplinary area
- CO10:** Understand the application of bio-statistical analysis on given data with the help of computer software technology
- CO11:** Learn about the tools and techniques of bioinformatics

**Course Code: BOT-610 (P)**

**Course Name: Botany – X (Practical Based on Theory Papers BOT-608 & BOT-609)**

After completion of this course, students will be able to perform practical of the various topics covered in the papers BOT-608 & BOT-609

**NAME OF PROGRAMME: B.SC. CHEMISTRY**

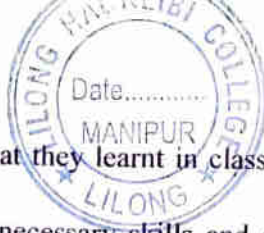
**Programme Outcome (POs):**

- PO1:** BSc. Chemistry course is designed to provide the students an inclusive understanding about the concepts, fundamentals, theories, applications and usage and hands on practical aspects of Chemistry.
- PO2:** To make aware the students the broad branches of Chemistry viz Physical, Inorganic, Organic and Analytical Chemistry and their differences.
- PO3:** The course content is so designed to that there is stepwise advancement of the subject knowledge from semester 1 to semester 6, spanning three years.
- PO4:** To make aware the students the analytical or practical skills so that students are equipped to handle various types of chemicals, and trained them about the first aid treatment.

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**PO5:** To correlate the students what they learnt in classroom and make them aware the actual applicability in real life.

**PO6:** To equip the students with necessary skills and subject knowledge and help themselves employable.

### Programme Specific Outcomes (PSOs):

**PSO1:** The students will understand the existence of matter in the universe, its compositions, different approaches to explain the existence through classical as well as quantum approach.

**PSO2:** Classification of elements, trends and behaviours, its application in predicting and explaining chemical behaviour.

**PSO3:** Students will learn to estimate the physical and chemical properties such surface tension, viscosity, pH, hardness of water, concentration of solution etc.

**PSO4:** Students will learn to estimate inorganic salt mixtures and organic compounds both qualitatively and quantitatively using the classical methods of analysis in practical classes.

**PSO5:** Students will grasp the mechanisms of different types of reactions both organic and inorganic and will try to predict the products of unknown reactions.

**PSO6:** Students will learn to synthesize the chemical compounds by manoeuvring the addition of reagents under optimum reaction conditions

### Course Outcomes (COs):

#### SEMESTER – I

Course Code: CH-101

Course Name: Inorganic Chemistry

**CO1:** Brief study of atom through classical as well as quantum approach.

**CO2:** Periodic classification of elements, trends and behaviour of chemical properties and its application in predicting and explaining chemical behaviour.

**CO3:** Study of different types of chemical bonding including directional, repulsion, bond strength, bond energy, % ionic character etc.

**CO4:** Theory of qualitative and quantitative analysis.

**CO5:** Study of structure and bonding in organic compounds.

**CO6:** Mechanism of organic reaction, methods of determining organic reactions mechanism.

**CO7:** Nomenclature of cycloalkane, size of ring, their chemical reactions.

**CO8:** Study of alkane, alkene, alkynes, their method of preparations and discussion on different types of their reaction.

**CO9:** Study of gaseous states, their motions, energy distribution, equilibrium and continuity of states.

**CO10:** Physical and chemical study of liquids.

**CO11:** Study of symmetry operation in different types of molecules, discussion on the arrangement of atoms, space groups, diffraction in solid states.

Course Code: CH-101 P

Course Name: Inorganic Chemistry (Practical)

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**CO1:** Semi-micro analysis of Inorganic mixture containing 4 radicals/ions.  
**CO2:** Volumetric estimation of metal as a part of Quantitative analysis.

## **SEMESTER – II**

**Course Code: CH-202**

**Course Name: Organic Chemistry**

- CO1:** Study of acid and base, different concepts/theories to explain acid and base.  
**CO2:** Discussion of oxidation and reduction, different approach to explain it with special emphasis by oxidation number.  
**CO3:** Study on protic and aprotic non-aqueous solvents and their Chemistry.  
**CO4:** Comparative studies of s-block elements and its importance in biological system.  
**CO5:** Concept of isomerism-structural and stereoisomerism. Study of D&L, R&S configurations, E,Z geometrical isomerism, more discussion on conformational isomerism. Difference between configuration and conformation.  
**CO6:** Study of aromatic and arene compounds, study of different types of reactions exhibited by these compounds with mechanism.  
**CO7:** To learn the different types of reaction undergone by alkyl and aryl halides with reaction mechanism.
- CO8:** Synthesis of alcohols, types of reaction, nomenclature of alcohols.  
**CO9:** To learn about various types of solutions, vapour pressure, distribution laws and limitations.  
**CO10:** Study about the colligative properties of dilute solution, its importance and applications.  
**CO11:** Study about colloids and surface chemistry.  
**CO12:** To learn about thermodynamics and its importance.

**Course Code: CH-202 P**

**Course Name: Organic Chemistry (Practical)**

- CO1:** Determination of melting point.  
**CO2:** Determination of boiling point.  
**CO3:** Determination of melting point of compounds in various ratio  
**CO4:** To learn about distillation using liquid mixture.  
**CO5:** To learn about the concept of crystallisation.  
**CO6:** To learn about decolourisation using charcoal.

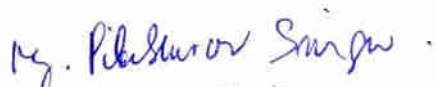
## **SEMESTER – III**


**Course Code: CH-303**

**Course Name: Physical Chemistry**

- CO1:** To learn about extraction process of some selected metals from their ores.  
**CO2:** Comparative study of p-block elements, salient feature of hydrides, halides, oxides and oxy acids; study of inter-halogens, poly-halogens; applications of p-block elements.  
**CO3:** Study of d-block elements, its position, characteristic properties. To learn about various oxidation number/state exhibited by d-block elements.  
**CO4:** To learn about coordination chemistry, their bonding, stereochemistry and geometrical isomerism exhibited by coordination compounds.

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**CO5:** To learn about phenols, their preparations, reactions of phenols. To learn about the reactions and its mechanism including many name reactions.

**CO6:** To learn about ethers and epoxides, their preparations, reactions & its mechanism.

**CO7:** To learn about aldehydes and ketones, their preparations, reactions aldehydes and ketones. To learn about the reactions and its mechanism including many name reactions.

**CO8:** Discussion about organic compounds of nitrogen, their structure, nomenclature, stereochemistry, and many important reactions.

**CO9:** Study about thermochemistry associated with chemical bond. To learn about effect of temperature on thermochemistry

**CO10:** Further/more study on thermodynamics continuation from previous semester.

**CO11:** Study of chemical equilibrium. Equilibrium constant and their dependence on temperature, pressure, concentration

**CO12:** To learn about chemical kinetics, different order reactions, experimental methods of determinations of rate laws.

**Course Code: CH-303 P**

**Course Name: Physical Chemistry (Practical)**

**CO1:** Determination of surface tension of an unknown liquid.

**CO2:** Determination of viscosity of an unknown liquid.

**CO3:** Determination of pH of different solutions using pH meter.

**SEMESTER – IV**

**Course Code: CH-404**

**Course Name: Analytical Chemistry**

**Co1:** Study about lanthanides, lanthanide contraction and its consequences. Use of lanthanides and their compounds

**CO2:** Study about the chemistry of actinides, its synthesis, separations, similarity between lanthanides and actinides.

**CO3:** Study of noble gases, their isolation, chemical properties, bonding and stereochemistry.

**CO4:** Classification of acid and bases as hard and soft, Pearson's concept.

**CO5:** To learn about carboxylic acids, their preparations, reactions undergone by them. To learn about the reactions and its mechanism including many name reactions.

**CO6:** To learn about carboxylic acid derivatives, their relative stability, interconversions, reactions undergone by them. To learn about the reactions and its mechanism

**CO7:** Study about organometallic compound such as organ magnesium, organ zinc, organ lithium compounds, their formations and chemical reactions.

**CO8:** Discussions about various polymers, natural and synthetic, mechanism of polymerisation reaction. Usage of polymers in daily life.

**CP9:** Study about catalyst, their specificity and selectivity. Theory of catalysis.

**CO10:** Study of ionic equilibria, common ion effect, buffer solution, solubility product and their importance in chemical reactions.

**CO11:** Study of phase equilibria, phase rule, application of one component system.


**Course Code: CH-404 P**

**Course Name: Analytical Chemistry (Practical)**

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- CO1:** To determine Hardness of water using EDTA  
**CO2:** To estimate nickel using DMG  
**CO3:** To estimate calcium content in chalk as calcium oxalate by permanganometry  
**CO4:** To estimate reducing sugar by titration with standard Fehlings solution /Benidict's solution  
**CO5:** To determine the equivalent weight of the given acid sample by direct titration method with alkali  
**CO6:** To determine the Saponification value of the given fat or oil sample.  
**CO7:** To estimate protein in the given sample by Folin Lowry method/biuret method.  
**CO8:** To estimate a reducing sugar by colorimetric method.  
**CO9:** To determine the concentration of a given sample by using Lambert-Beer's law.  
**CO10:** To determine the amount of iodine from a given sample (salt) by titration method.

### **SEMESTER - V**

**Course Code: CH-505**

**Course Name: Inorganic Chemistry**

- CP1:** Discovery of radioactivity, nature of radiation, artificial radioactivity, nuclear energy, its types and applications.  
**CO2:** Chemistry of compounds of non-transition elements, their preparations and properties.  
**CO3:** Chemistry of second and third transition element series, their general characteristics, comparative studies. Study of some important compounds of these metals.  
**CO4:** Effect of alloying, types of alloys, rules for the formation of alloys, intermetallic compounds.  
**CO5:** Fundamental laws of photochemistry (Lambert-Beer's law), molar absorptivity, energy levels of electron transition, use of UV-visible spectroscopy in chemistry.  
**CO6:** Study of Infrared Spectroscopy, its fundamentals and its use in the study of groups like C=N, -O, C=C, COOR, N-H and CONH etc.  
**CO7:** A brief outline of thermodynamic stability of metal complexes and factors affecting the stability, substitution reactions of square planar complexes.  
**CO8:** Study of environmental chemistry, chemistry in atmosphere, Water pollution, nature of pollutants, treatment of water. Study of toxic chemicals in environment, biochemical effects of mercury, cadmium, lead and pesticides, control and treatment of the above trace elements, solid waste pollution, treatment and disposal.

**Course Code: CH-506**

**Course Name: Organic Chemistry**

- CO1:** Chemistry of carbohydrates classification and nomenclature of monosaccharides, formation, constitution of glucose and fructose introduction to disaccharides (maltose, sucrose and lactose) and polysaccharides (starch and cellulose) without involving structure determination.  
**CO2:** Classification, structure and stereochemistry of amino acids and their chemical reactions. Classification of proteins, Peptide structure determination.

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- CO3:** Study of Nucleic acids, Constituents of nucleic acids, Ribonucleosides and ribonucleotides. The double helical structure of DNA.
- CO4:** Fats, Oils, detergents edible and industrial oils of vegetables origin, common fatty acids, hydrogenation of unsaturated oils, Saponification value, iodine value, acid value. Soaps, synthetic detergents, alkyl and aryl sulphonates.
- CO5:** Chemistry of pericyclic reactions their classification, electrocyclic reactions (thermal and photo chemical) FMO approach, Diels-Alder Reaction.
- CO6:** Chemistry of synthetic dyes, colour and constitution (electronic concept). Classification of dyes, study of various dyes.
- CO7:** Chemistry of steroids, occurrence, nomenclature, basic skeleton, stereochemistry. Isolation, structure determination and synthesis of Cholesterol, Estrone, biosynthesis of steroids.
- CO8:** Chemistry of terpenoids, occurrence, isolation, classification of terpenes, chemical composition, general methods of determining structure Isoprene rule, synthesis and structure of citral and limonene.
- CO9:** Chemistry of alkaloids, extraction and general methods of determining structure, isolation, structure and synthesis of nicotine, atrophine and cocaine.
- CO10:** Study of enzymes as biocatalyst, chemical nature, general characteristics and nomenclature of enzyme activity, active sites, study of some enzymes.

**Course Code: CH-507**

**Course Name: Physical Chemistry**

- CO1:** Uncertainty in measurement: types of uncertainties, statistical treatment of uncertainties, graphical and numerical data reduction.
- CO2:** Quantum chemistry, treatment in simple molecule, introduction to quantum mechanical operators.
- CO3:** Detail study of photochemistry, different laws governing, uses of photochemistry in natural and chemical processes, fluorescence, chemiluminescence and photosensitisation.
- CO4:** Gibbs-Helmholtz equation; Maxwell relations, Gibbs-Duhem equation, chemical potential, Nernst heat theorem, Third law of thermodynamics.
- CO5:** Study of Specific heats of solids and different laws governing it.
- CO6:** Purpose of statistical thermodynamics, different laws, concept of ensembles.
- CO7:** Interaction of molecules with electromagnetic radiations, elementary idea of different spectroscopic techniques and the information obtainable from each.
- CO8:** Classification of polymers – study of natural and synthetic rubber, properties of polymers.
- CO9:** Chemistry of Conductance, laws governing conductance, uses in chemistry.

**Course Code: CH-508 P**

**Course Name: Inorganic and Physical Chemistry (Practical)**

- CO1:** Preparation of inorganic complexes.
- CO2:** Estimation of two constituents from a binary mixture (one volumetrically and one gravimetrically)
- CO3:** Semimicro analyses of five radicals containing at least one rare element
- CO4:** Study the equilibrium of a given reactions by the distribution method

**SEMESTER - VI**

**Course Code: CH-608**

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**Course Name: Inorganic Chemistry**



- CO1:** Theory of coordination bond, Effective atomic number rule, Valence bond theory  
crystal field theory. splitting of d-orbitals in different stereochemistries, factors that influence complex formation
- CO2:** Magnetic properties of transition metal complexes, types of magnetic behaviour, methods of determining magnetic susceptibility, applications of magnetic moment data in 3d transition metal complexes.
- CO3:** Inorganic polymers, silicates and their classifications and structures, study of some inorganic polymers.
- CO4:** Study of different types of thermoanalytical methods such as thermogravimetric (TGA), scanning Calorimetry (DSC), factors affecting thermoanalytical techniques.
- CO5:** Organometallic Chemistry, nomenclature and classification of organometallic compounds w.r.t inorganic chemistry.
- CO6:** Study of essential and non-essential trace elements in biological processes, study of some important inorganic metals in biological systems.
- CO7:** Inorganic rings and cages boron hydrides, diborane and higher boranes, borazine, tetrathiolane, tetranitride, synthesis, structure and their properties.
- CO8:** Classification of ionic structures, layer structures, lattice energy, Born-Haber cycle, non-stoichiometric defects and stoichiometric defects, semiconductor and transistors, photovoltaic cells.

**Course Code: CH-609**

**Course Name: Organic Chemistry**

- CO1:** Organo sulphur compounds nomenclature, structural features, Methods of formation and chemical reactions.
- CO2:** Study of elimination Reaction, types, difference between elimination vs substitution reactions, factors affecting the elimination and substitution reactions.
- CO3:** Study about organic synthesis via enolates.
- CO4:** Study about heterocyclic compounds, simple 5,6-member ring, condensed ring, their properties and chemical reactions, mechanism of reactions
- CO5:** Study about medicinal chemistry, drugs and antibiotics - synthesis and structure of some important drugs.
- CO6:** Principles and application of different types of chromatographic techniques.
- CO7:** Principles of mass spectroscopy and its use in chemistry.
- CO8:** Study about nuclear magnetic resonance spectroscopy, its concepts, and its use in organic chemistry.
- CO9:** Study about electron paramagnetic resonance spectroscopy and its use in organic chemistry.
- CO10:** Principles and applications of green chemistry. advantages and disadvantages.

**Course Code: CH-610**

**Course Name: Physical Chemistry**

- CO1:** Study of computer applications in chemistry.
- CO2:** Study of quantum chemistry, Schrodinger equation for a free particle moving in one dimensional box and its solutions, probability distribution of electrons radial probability distribution curves.

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**CO3:** Spectroscopy, energy levels, selection rules, nature of spectrum for rotational, vibrational and Raman spectroscopy.

**CO4:** Study of symmetry and point groups for some simple molecules.

**CO5:** Discussion on electrochemistry, chemical cell, concentration cell and their use in chemistry, study of different theories governing strong electrolytes,

**CO6:** Study of statistical thermodynamics such as Maxwell-Boltzmann distribution law, function and its physical significances, types of partition functions.

**CO7:** Study of surface-active agents, hydrophilic and hydrophobic groups, amphiphiles, classification of surfactants, micelles and micelles formation.

**CO8:** Study of different theories of chemical kinetics and Kinetics of complex reactions.

**CO9:** Study of phase equilibria of two component system with examples.

**Course Code: CH-611 P**

**Course Name: Organic and Physical Chemistry (Practical)**

**CO1:** Qualitative Analysis of organic compounds, which include detection of elements, functional group, preparation of solid derivative.

**CO2:** Preparation of organic compounds.

**CO3:** To study changes in conductance in a given acid base reactions.

**CO4:** Study the reaction kinetics in a given reactions.

**CO5:** Verification of Lambert-Beer's Law.

**CO6:** Determination of pK (indicator) for phenolphthalein or methyl red.

**CO7:** Study the formation of a complex between ferric and thiocyanate (or salicylate) ions.

**NAME OF PROGRAMME: B.A. ECONOMICS**

**Programme Outcome (POs):**

After completion of B.A. Economics Programme, students will be able to

**PO1:** Have in-depth knowledge of basic economic concepts and theories which will enable them to do post-graduation in economics and take up research in various economic fields, go for economic related professions, or can be an active economic agent or advisor in the sustainable growth of the economy.

**PO2:** Know how the economy is composed of many micro and macroeconomic agents which act and react upon one another that shape the growth and development of the economy as a whole.

**Programme Specific Outcomes (PSOs):**

On completion of B.A. Economics Programme, students will be able to,

**PSO1:** Understand the basic concepts of economics.

**PSO2:** Analyse working of different market conditions.

**PSO3:** Understand determination of equilibrium income, employment and output of the economy as a whole.

**PSO4:** Know about budgeting, tax, revenues and expenditure, and centre-state financial relationship

**PSO5:** Apply quantitative techniques in economic analysis.

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**PSO6:** Learn about theories of economic growth, development and policies concerning these.

**PSO7:** Understand the fundamentals of environmental problems, policies and solutions.

**PSO8:** Learn about trade theories, policies and important organisation concerning trade.

**Course Outcomes (COs):**

**SEMESTER – I**

**Course Code: ECO 101**

**Course Name: Indian Economic Problems**

On completion of the course, students will be able to

**CO1:** Know the features and nature of Indian economy; changes in national income, its composition and sectoral distribution.

**CO2:** Know about India's natural resources, relationship between economic development & environmental degradation and basic features of India's population

**CO3:** Understand about India's agricultural scenario since independence including issues like green revolution, land reforms & food security

**CO4:** Learn about industrialization in India, pattern, its growth and policies regarding this.

**CO5:** Know the prevailing policies and programs related to Indian foreign trade, economic development and poverty alleviation in the economy.

**SEMESTER – II**

**Course Code: ECO 202**

**Course Name: Micro Economics-I**

At the end of this course, students will be able to

**CO1:** Basic concepts of microeconomics

**CO2:** Understand basics of demand theory

**CO3:** Learn theories of production and costs; laws of production and farm equilibrium

**CO4:** Know equilibrium conditions under perfect competition and monopoly

**SEMESTER – III**

**Course Code: ECO 303**

**Course Name: Micro Economics-II**

At the end of this course, students will be able to comprehend

**CO1:** Theories of factor pricing/distribution under competitive and monopolistic factor markets

**CO2:** General equilibrium system particularly under 2x2x2 model

**CO3:** Social welfare criteria and its measurement

**CO4:** Externality, types and its correction

**CO5:** Market with asymmetric information and correction techniques

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**SEMESTER – IV**

**Course Code: ECO 404**

**Course Name: Macro Economics**



At the end of this course, students will

- CO1:** Learn classical theory of income and employment
- CO2:** Understand Keynesian theory of income and employment
- CO3:** Know about general equilibrium analysis, IS-LM curves and fiscal & monetary policies.
- CO4:** Learn about inflation and its theories and measures; money supply, its concept and measures
- CO5:** Know about growth theories

**SEMESTER – V**

**Course Code: ECO 505**

**Course Name: Public Finance**

At the end of this course, students will be able to

- CO1:** Learn functions of fiscal policies for getting maximum social advantage.
- CO2:** Understand different types and techniques of government budget.
- CO3:** Know the types of taxation and public borrowings as sources of public revenue.
- CO4:** Understand how public expenditure is carried out and its effect on production, distribution and economic stability.
- CO5:** Learn centre and state financial relations.

**Course Code: ECO 506**

**Course Name: Political Economy of Development**

At the end of this course, students will be able to

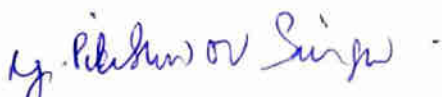
- CO1:** Understand the concept of political economy & how it came into being.
- CO2:** Know the evolution of society, state and economy.
- CO3:** Learn about capitalist mode of production, role of MNCs and development under monopoly
- CO4:** Understand New Political Economy, Globalisation and Structural Adjustment Programmes
- CO5:** Know about political economy of India's economic development – feudalism in pre-independence & post-independence India, Indian agriculture and about post-liberalisation political economy.

**Course Code: ECO 507**

**Course Name: Quantitative Methods for Economic Analysis**

At the end of this course, students will be able to

- CO1:** Know the importance of statistical and mathematical tools and measures in economics
- CO2:** Understand the application of mathematical and statistical tools in solving various economic problems.

  
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CO3: Understand the concept and application of set theory and probability in economics

CO4: Learn application of the concepts of probability distribution, correlation, regression analysis, concept of index numbers etc. and draw inferences about the prevailing economic parameters of the economy.

CO5: Comprehend the concept of index number, problems in its construction and its importance in economics

## SEMESTER – VI

Course Code: ECO 608

Course Name: Development Economics

At the end of this course, students will be able to

CO1: Learn basic concepts and theories of economic growth and development.

CO2: Know different strategies of development that countries may adopt depending on their economic conditions and resource availability..

CO3: Understand various policy issues of economic development such as fiscal, monetary and price policies

CO4: Learn deeper about trade policies and recent changes in trade policies, developing countries and WTO

CO5: Know about different concepts of planning especially in the context of developing economy

Course Code: ECO 609

Course Name: Environmental Economics

After the completion of this course, students will be able to

CO1: Understand the concept of environmental and natural economics, how environmental economics came into being as a discipline and more importantly the existing interrelationship between the economy and the environment.

CO2: Know different types of environmental problems including climate change and their policy solutions.

CO3: Understand about the environmental consequences of market failure, pollution externalities, issues of property rights and solutions for market failure.

CO4: Learn about how natural resources both renewable and non-renewable resources are to be exploited in a sustainable way under the condition of perfect and monopoly market situations.

CO5: Comprehend of the relationship between the environmental quality and economic development and what exactly is sustainable development.

Course Code: ECO 610

Course Name: International Economics

At the end of this course, students will be able to


CO1: Learn basic theories of International trade

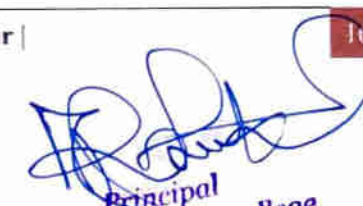
CO2: Understand modern theories of international trade

CO3: Know about balance of payment (BOP) and its equilibrium and disequilibrium concepts

CO4: Learn about trade policies - free and protected

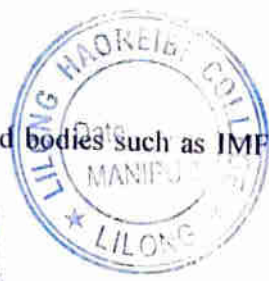
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CO5: Know about international trade related bodies such as IMF, WTO, etc. in the context of developing countries



**NAME OF PROGRAMME: B.A. EDUCATION**

**Programme Outcome (POs):**

After completion of the B.A. Education Programme, students will be able to,

**PO1:** know the concept and scope of education, aims of education, start their education with a fixed aim and by this aim they may success in life.

**PO2:** know the concept and scope of educational philosophy which give the students source of knowledge and they also know why it is necessary in our life

**Programme Specific Outcomes (PSOs):**

**PSO1:** Recall and recognize some educational terminology, educationists, psychologists, some basic concepts, definitions of education, learning, teaching etc.

**PSO2:** Synthesize new methods, strategies, theories on the basis of the knowledge gained during the programme

**PSO3:** Appreciates the contributions of philosophers, educationists and sociologists for the development of educational theory and practice.

**PSO4:** Applies the knowledge in the course of teaching in the schools.

**PSO5:** Imparting a sound knowledge of education and the effects of attitude, behaviour and cultural osmosis

**Course Outcomes (COs)**

**SEMESTER – I**

**Course Code: ES 101**

**Course Name: Philosophical and Sociological Foundation of Education**

**CO1:** To introduce the concept, scope, aims and function of education.

**CO2:** To understand the Role of Philosophy in Education.

**CO3:** To know about the concept of freedom and discipline

**CO4:** To understand the Nature for Sociological Approach in education.

**CO5:** To understand the social group, culture and social problems.

**SEMESTER – II**

**Course Code: ES 201**

**Course Name: Educational Psychology and Pedagogy**

**CO1:** To know the education and Psychology and their relation.

**CO2:** To understand the personality, its types and traits.

**CO3:** To understand the Theories of learning (Thorndike and Skinner), its meaning.

**CO4:** To gain knowledge of Pedagogy and its implications, general principal of teaching.

**CO5:** To develop the idea of classroom behaviour – characteristics of good teacher behaviour.

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**SEMESTER – III**

**Course Code: ES 301**

**Course Name: Development of Education in India**



- CO1:** To know the Education in ancient India – Vedic education, Buddhist education, aims.
- CO2:** To know the Education in Medieval India – types of Education Institution.
- CO3:** To understand the Education in British India.
- CO4:** To know the development of Indian Education in the Post-independence period – Kothari Commission 1964-66, NPE 1986 and POA 1992.
- CO5:** To understand the development of Education in Manipur.

**SEMESTER – IV**

**Course Code: ES 401**

**Course Name: Issues and Trend in Contemporary Indian Education**

- CO1:** To gain knowledge about Elementary Education – District Primary Education programmes and SSA.
- CO2:** To gain knowledge about Secondary Education – aims and objectives of general and vocational secondary education.
- CO3:** To understand the Alternative Schooling – Non-formal, National Adult Education programme, National Literacy Mission.
- CO4:** To know about continuing Education – open Learning system, Mass media, communication process, use of software in education.
- CO5:** To understand the population education, Value Education and work Experience – Sex Education, Adolescent Education.

**SEMESTER – V**

**Course Code: ES (H) 505**

**Course Name: Educational Evaluation and statistics in Education**


- CO1:** To learn the Educational Evaluation – educational measurement, need for measurement in education.
- CO2:** To know the Types of evaluation – Formative and summative evaluation etc.
- CO3:** To understand the measuring instruments and their classifications – Errors in measurement.
- CO4:** To know the Statistics in education – Meaning, Nature and scope of Educational Statistics.
- CO5:** To know the types of data and bivariate distribution – grouped and ungrouped data.

**Course Code: ES (H) 506**

**Course Name: Educational Management and Educational Technology**

- CO1:** To know the Educational Management – concept of educational management, type etc.
- CO2:** To know the financial management and managerial behaviour.
- CO3:** To understand the educational planning – meaning, need and significance of educational planning.

  
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- CO4:** To know the Educational Technology concept and scope of educational technology
- CO5:** To know the System approach to instruction concept, components, physical and human resources, steps.



**Course Code: ES (H) 507**

**Course Name: Educational Guidance and Curriculum Construction**

- CO1:** To understand the concept, importance and necessity of educational guidance
- CO2:** To know the functions vocational guidance and the relationship between education and vocational guidance
- CO3:** To know the concept of counselling, types, steps in it and techniques of counselling
- CO4:** To understand the concept of curriculum construction, its principal and the sociological and psychological foundations of curriculum
- CO5:** To learn about curriculum development process and national curriculum framework

**SEMESTER – VI**

**Course Code: ES (H) 608**

**Course Name: Educational Thought and Practice**

- CO1:** To learn about the educational ideas and contribution of JJ Rousseau
- CO2:** To understand the philosophy, methods and contribution of John Dewey in the field of education
- CO3:** To know about Tagore's philosophy and methods of education, his Shantiniketan and Vishva Bharati
- CO4:** To learn about educational philosophy and methods of teaching as described by Swami Vivekananda
- CO5:** To know about Mahatama Gandhi's philosophy and methods of education

**Course Code: ES (H) 609**

**Course Name: Child Psychology**

- CO1:** To know the importance of child hood period and modern approaches to child education
- CO2:** To understand the factors affecting development of child, characteristics and needs of child and his/her early experiences
- CO3:** To learn about child's development upto pre-adolescence like physical & motor, language & emotional development and socialisation processes
- CO4:** To learn about the readiness of child to learning individual differences in abilities, interests and their implications in education
- CO5:** To understand fundamental needs of child, role of family, school & peers and about their adjustment problems and abnormal behaviours in different stages

**Course Code: ES (H) 610**

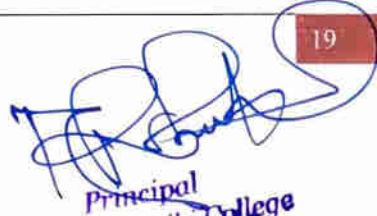
**Course Name: Experimental Education and Statistics**

- CO1:** To familiar with experimental works that are parts of course syllabus and be conversant with various statistical tools required in the course
- CO2:** To understand the test development indices in the course

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**NAME OF PROGRAMME: B.A. ENGLISH**



**Programme Outcome (POs):**

- PO1:** Students should be familiar with representative literary and cultural texts within a significant number of historical, geographical, and cultural contexts.
- PO2:** Students should be able to apply critical and theoretical approaches to the reading and analysis of literary and cultural texts in multiple genres.
- PO3:** Students should be able to identify, analyze, interpret and describe the critical ideas, values, and themes that appear in literary and cultural texts and understand the way these ideas, values, and themes inform and impact culture and society, both now and in the past.
- PO4:** Students should be able to write analytically in a variety of formats, including essays, research papers, reflective writing, and critical reviews of secondary sources.
- PO5:** Students should be able to ethically gather, understand, evaluate and synthesize information from a variety of written and electronic sources.
- PO6:** Students should be able to understand the process of communicating and interpreting human experiences through literary representation using historical contexts and disciplinary methodologies.

**Programme Specific Outcomes (PSOs):**

- PSO 1:** Understand the basics of grammar, usage and effective communication and comprehend certain form of literature like short stories.
- PSO 2:** Perspective of literary movements that existed from Old English Period to 19<sup>th</sup> Century. Familiarity with poetry as well as drama also emphasized.
- PSO 3:** Develop keen knowledge on the development of British fiction.
- PSO 4:** Define literary theory and terms in criticism.
- PSO 5:** Develop the knowledge of grammatical system of English language.
- PSO 6:** Apprehend 20<sup>th</sup> Century British Literature, Indian Writing in English, North East Literature, Commonwealth and American Literature as well as European Literature in Translation.

**Course Outcomes (COs):**

**SEMESTER – I**

**Course Name: General English I**

**CO1:** The course is intended to introduce the students to the basics of grammar, usage, and effective communication.

**Course Code: E1-101**

**Course Name: English Literature - History, Poetry and Drama (Old English to 19th Century)**

After completion of this course, students will be able to

- CO1:** Trace the developmental history of English Literature from Old English Period to 19<sup>th</sup> Century.
- CO2:** Show familiarity with major literary works by British writers in the field of Drama and Poetry.
- CO3:** Be acquainted with major religious, political and social movements from 14<sup>th</sup> to 19<sup>th</sup> century and their influence on literature.

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**CO4:** Learn various interpretative techniques to approach literary texts of varied genres.



## **SEMESTER II**

**Course Name: General English II**

After completion of this course, students will be able to

**CO1:** Appreciate the work of Shakespearean drama as well as value dramas to be a source of great wisdom.

**CO2:** Appreciate a wide range of poetry ranging from the times of Shakespeare to the modern period.

**CO3:** Show familiarity with major works by British, American and Indian poets.

**Course Code: E2-202**

**Course Name: British Fiction**

After completing the course, students will be able to

**CO1:** Know how and why British Fiction emerged as a distinct field of study.

**CO2:** Trace the development of history of British Fiction from its beginning.

**CO3:** Interpret the works of great writers of British Fiction.

**CO4:** Demonstrate, through discussion and writing, an understanding of significant cultural and societal issues presented in British Fiction

## **SEMESTER III**

**Course Code: E3-303**

**Course Name: Western Criticism**

After completion of this course, students will be able to

**CO1:** Learn the history of literary criticism and trace the development of literary criticism.

**CO2:** Apply critical and technical virtuosity to describe and analyze, and formulate an argument about literary and other texts.

**CO3:** To have an insight into the great works of western critics and appreciate their works.

**CO4:** Develop a skill in applying various perspective and outlook in interpreting a specific text.

**CO5:** Understand various critical terms and technique that will be important in analysis of various works of literature.

## **SEMESTER IV**

**Course Code: E4-404**


**Course Name: Linguistics and English Language**


After completion of this course, students will be able

**CO1:** To familiarize students with the speech sounds and the phonological aspects of the English language.

**CO2:** To lead to a greater understanding of the human communicative action through an objective study of language.

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- CO3:** To familiarize students with the key concepts of linguistics and develop awareness of the latest trends in language study.
- CO4:** To help students move towards better and intelligible pronunciation and to improve general standard of pronunciation in everyday conversation.

#### **SEMESTER V**

**Course Code: EnH-505**

**Course Name: 20th Century British Literature**

After completion of this course, students will be able to

- CO1:** Grasp an understanding of the poems of eminent poets of 20<sup>th</sup> century and be able to study and interpret representative writings from 20<sup>th</sup> century.
- CO2:** Be acquainted with the changing trends in poetry with respect to Victorian poetry.
- CO3:** Familiarize students with the works of modern British fiction and reflect upon the great upheaval that the literary works has undergone during 20<sup>th</sup> century.
- CO4:** Acquaint students with the trends of drama in 20<sup>th</sup> century and interpret the works as a reflection of the modern world.

**Course Code: EnH-506**

**Course Name: Indian Writing in English**

After completion of this course, students will be able to

- CO1:** Know how and why Indian Writing in English emerged as a distinct field of study.
- CO2:** Trace the development of history of Indian English literature from its beginning to the present day.
- CO3:** Interpret the works of great writers of Indian writers in English.
- CO4:** Demonstrate, through discussion and writing, an understanding of significant cultural and societal issues presented in Indian English literature.

**Course Code: EnH-507**

**Course Name: Literary Theory**

After completion of this course, students will be able to

- CO1:** Learn the history of literary criticism and various literary theories.
- CO2:** Apply critical and technical theory and vocabulary to describe and analyze and formulate an argument about literary and other texts.
- CO3:** Think about the non-fixity of meaning of literary texts.
- CO4:** Develop a skill in applying various literary theories in interpreting a specific text.

#### **SEMESTER VI**

**Course Code: EnH-608**

**Course Name: North-East Literature**

After completion of this course, students will be able to

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- CO1: Know the importance of North-East Literature and its distinct characteristic features.
- CO2: Read and understand some of the representative popular literary works.
- CO3: Understand how North-East literature is able to provide a literary genre that echoes the social, cultural and political affiliations of the North East India.
- CO4: Probe into the literary and aesthetic merits of North-East literature.

**Course Code: EnH-609**

**Course Name: Commonwealth and American Literature**

After completion of this course, students will be able

- CO1: To acquire knowledge about Commonwealth and American literature, their cultural themes, literary periods and key artistic features.
- CO2: To understand the various aspects of Commonwealth and American society through a critical examination of the literary texts representing different periods and cultures.
- CO3: Probe into the literary and aesthetic merits of European Literature.

**Course Code: EnH-610**

**Course Name: European Literature in Translation**

After completion of this course, students will be able to

- CO1: Read and understand about the rich classical texts of Greco-Roman literatures as well as European literatures in translated versions.
- CO2: Trace the nature of influence that all the classical texts have on modern English literatures.
- CO3: Appreciate European Literature as a source of great wisdom.
- CO4: Interpret these texts from contemporary points of view.
- CO5: Probe into the literary and aesthetic merits of European Literature.

**NAME OF PROGRAMME: ENVIRONMENTAL STUDIES**

**SEMESTER – IV (General Foundation Course)**

**Course Code: EVS: SE 44**

**Course Name: Environmental Studies**

Under the directive of the Hon'ble Supreme Court of India to the University Grant Commission (UGC) to introduce a basis course on Environment for student, it was decided by the UGC that a six- month's compulsory core module/course in Environmental Studies be prepared and introduced in all in all the Universities/ Colleges in India.

**Course Outcomes (CO):**

**SEMESTER – IV (General Foundation Course)**

**Course Code: EVS: SE 44**

**Course Name: Environmental Studies**

After completion of this course the following outcomes are expected from the students:

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**CO1:** Understand our natural surroundings; Get basic knowledge about the environment and its related problems; Help the concerned individual in identifying and solving environment; Participate in environment protection and environment improvement.

**CO2:** Understand the factors affecting the need to find sustainable practices for production of food, feed and fiber crops and how to implement and evaluate them; Adapt to the concept of 3R (Reuse, Recovery and Recycle); Understand ecological processes and regulation of the energy flow, supporting life system and providing stability.

**CO3:** Provide habitat to wild animals and plants; explain and identify the role of the organism in energy transfer; explain the difference between a Qualitative and Quantitative study of plants and animals.

**CO4:** Recognize different types of habitats and the animals that live within them; observe how the animals within a habitat depend on each other; examine how animals depend on these natural resources; identify the natural resources within habitats.

**CO5:** List out sources, effects and remedies of environmental pollution; understand that the green revolution is the best solution to stop pollution; suggest different control measures related to Environmental pollution.

**CO6:** Understand and evaluate the global scale of environmental pollution; illustrate depleting nature of Environmental resources and global Environmental crises; illustrate and analyse various case studies related to Environmental legislation; understand over population effects the environment; understand over population effect the human health, human right and value education; deliver public awareness through Information technology.

## NAME OF PROGRAMME: B.A./B.SC. GEOGRAPHY


### Programme Outcome (POs):

The BA/BSc Geography programme concerns mainly of the changes in spatial attributes in a temporal perspective. The Honours programme in Geography is tailored to meet the students' specific educational and professional goals in mind. It focuses on spatial studies, qualitative as well as quantitative, and emphasizes on human-environment relationship. During the first year of the programme (1st and 2nd Semesters), the students are trained on basic thoughts and concepts of geography as a core discipline. The second year (3rd and 4th Semesters) introduces the cartographic techniques to incorporate different geographical studies in the form of practical papers. The third year (5th and 6th Semesters) allows students to concentrate on specific areas of the subject, on which they complete their field reports with advanced practical papers – Cartography, Remote Sensing and GIS. After completing the programme, students will be amply prepared for professional careers in geography and allied disciplines like GIS and Remote Sensing. They will also be able to pursue M.A./M.Sc. Programme in Geography in their higher studies.

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## Programme Specific Outcomes (PSOs):

### **PSO1. Understanding Geography as a core discipline**

Students will be introduced the basic thoughts of geography as a core discipline along with the various stages of development of the subject. The interrelationship with other disciplines will also be learned.

### **PSO2. Acquiring Knowledge of Physical Geography:**

Students will gain the knowledge of physical geography. Student will have a general understanding about the geomorphological and geotechnical process and formation. They will be able to correlate the knowledge of physical geography with the human geography.

### **PSO3. Acquiring Knowledge of Human Geography:**

Students will be able to acquire the knowledge of Human Geography and will correlate it with their practical life.

### **PSO4. Ability of Problem Analysis:**

Students will be able to analyze the problems of physical as well as cultural environments of both rural and urban areas. Moreover they will try to find out the possible measures to solve those problems.

### **PSO5. Conduct Social Survey Project:**

They will be eligible for conducting social survey project which is needed for measuring the status of development of a particular group or section of the society.

### **PSO6. Application of modern instruments:**

Students will be able to learn the application of various modern instruments and by these they will be able to collect primary data.

### **PSO7. Application of GIS and modern Geographical Map Making Techniques:**

They will learn how to prepare map based on GIS by using the modern geographical map making techniques.

### **PSO8. Development of Observation Power:**

As a student of Geography Honours Programme, they will be capable to develop their observation power through field experience and in future they will be able to identify the socio-environmental problems of a locality.

### **PSO9. Development of Communication Skill and Interaction Power:**

After the completion of the project they will be efficient in their communication skill as well as power of social interaction. Some of the students are being able to understand and write effective reports and design credentials, make effective demonstrations, and give and receive clear instructions.

### **PSO10. Enhancement of the ability of Management:**

Students will be able to demonstrate knowledge and understanding of the management principles and apply these to their own work, as a member and leader in a team, to manage projects. They will perform effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

### **PSO11. Understand Environmental Ethics and Sustainability:**

Students will be able to understand the impact of the acquired knowledge in societal and environmental contexts, and demonstrate the knowledge of need for sustainable development.

### **PSO12. Life-long learning:**

Students will also be able to identify the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of societal and environmental change.

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## **SEMESTER – I**

**Course Code: GG-E101**

**Course Name: Introduction to Geography**

**CO1:** To introduce the concepts and nature of geography and its relationship with other disciplines.

**CO2:** To study the contributions of various schools of thought in the emergence of geography as a discipline.

**CO3:** To understand the dualism of geography and its branches.

**CO4:** To understand geography as human ecology, areal study and regional study.

**CO5:** To gain basic ideas of cartography, quantitative techniques, field study, remote sensing and GIS.

## **SEMESTER – II**

**Course Code: GG-E202**

**Course Name: Physical Geography**

**CO1:** To understand different theories of the origin of earth and its dynamic state.

**CO2:** To know about the weathering processes and associated landforms.

**CO3:** To gain knowledge about earth's atmosphere and climate.

**CO4:** To develop an idea about concept of earth's wind systems.

**CO5:** To acquire knowledge about different oceanographic phenomena.

## **SEMESTER – III**

**Course Code: GG-E303 (i)**

**Course Name: Human Geography**

**CO1:** To understand the basic concepts of human geography as a major branch of geography.

**CO2:** To gain knowledge about the division of mankind, spatial distribution of races and linguistic groups.

**CO3:** To develop the idea of various economic activities and their importance.

**Course Code: GG-E303 (ii) P**

**Course Name: Cartography-I (Practical)**

**CO1:** To develop the idea of the various scales used in geographic mapping.

**CO2:** To gain knowledge about landform mapping profiles and analysis.

**CO3:** To acquire experience about incorporating data representations in the study of various geographic parameters primarily climate using relevant instruments.

## **SEMESTER – IV**

**Course Code: GG-E404 (i)**

**Course Name: Population & Settlement Geography**

**CO1:** To gain knowledge different aspects of population geography.

**CO2:** To know about classification and morphology of human settlements.

**CO3:** To build an idea about urban and rural settlements, and its relationship with environment and also different theories related to settlement geography.

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**Course Code: GG-E404 (ii) P**  
**Course Name: Cartography-II (Practical)**

- CO1: To know about diagrammatic data representations like line, bar and circle.
- CO2: To learn and analyze the significance of statistics in geography.
- CO3: To develop an idea about different types of thematic mapping techniques.

**SEMESTER – V**

**Course Code: GG-H505**  
**Course Name: Geomorphology**

- CO1: To develop an idea about geomorphology and different types of fundamental concepts.
- CO2: To explain earth's interior in the backdrop of various theories of origin of the Earth and its dynamism.
- CO3: To study the origin of rocks and minerals and also their importance.
- CO4: To understand the processes of erosion, deposition and resulting landforms.
- CO5: To acquire knowledge about various applications of geomorphological studies.

**Course Code: GG-H506**  
**Course Name: Geography of India**

- CO1: To understand Indian Geography in the context of South and Southeast Asia.
- CO2: To learn about the major resources of India and their distribution.
- CO3: To understand trade, transport and communication in India and also the regional planning in India.
- CO4: To develop an idea about the geography of North East Indian region.
- CO5: To acquire knowledge about the detailed geography of Manipur.

**Course Code: GG-H507 P**  
**Course Name: Cartography-III (Practical)**

- CO1: To learn various profiling techniques of drainage systems.
- CO2: To interpret geological maps and drawings.
- CO3: To bring direct interaction with different types of land surveying techniques like plane table surveying, etc.
- CO4: To acquire knowledge about various map projections.
- CO5: To learn to prepare and use map projections.

**SEMESTER – VI**

**Course Code: GG-H608**  
**Course Name: Economic Geography**

- CO1: To understand economic geography and various sectors of economy.
- CO2: To learn about natural resources with special focus on agricultural resources.
- CO3: To know the minerals and industries and their distribution.
- CO4: To develop an idea about trade and transport.
- CO5: To acquire knowledge about the global distribution and concentration of quaternary activities with special emphasis on India's position in the global economy.

**Course Code: GG-H609**

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**Course Name: World Regional Geography**

- CO1: To understand the overall geography of Asia as a major region of the world.
- CO2: To learn the geographical aspects of European region.
- CO3: To know the geographical aspects of North and South America.
- CO4: To develop an idea about the geographies of Australia, New Zealand and the Pacific Islands.
- CO5: To acquire knowledge about geography of African region.

**Course Code: GG-H610 P**

**Course Name: Cartography-IV (Practical)**

- CO1: To learn Dumpy level techniques for preparation of road profile and contouring and use of Theodolite for measurement of heights and distances.
- CO2: To develop an idea about Remote Sensing, GIS and Satellite image interpretation.
- CO3: To understand the meaning of field work and learn preparation of field report by identifying and conducting a case study.

**NAME OF PROGRAMME: B.A. HISTORY**

**Programme Outcome (POs):**

The Undergraduate Programme in BA History intends to provide the following Program Outcomes

- To gain knowledge and understanding on historical events, backgrounds and development of the different regions of the world.
- To understand background of our religion, culture, institutions, administration, art, architecture, economy, and so on.
- To develop interest in the study of history and further in historical research by acquire the skill for critical review and analysis of the past events.
- To help the student in demonstrating their knowledge of History in competitive exams and career.

**Programme Specific Outcomes (PSOs):**

- To enable the students to know about the history of Ancient India from its earliest time.
- To provide knowledge about the history of the Medieval India to the students.
- To make understand the students about the history of Modern India and Indian National Movement.
- To impart knowledge of the history of different regions of the world especially the history of Modern Europe, South East Asia and America.
- To provide knowledge and understanding of the history of Manipur.
- Application of methodology and tools of social sciences in historical analysis.

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## Course Outcomes (COs)

### **SEMESTER – I**

**Course Code: HIS 101**

**Course Name: History of Ancient India from Early Period to 6th century BC.**

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

**CO1:** Know the different sources of the Ancient Indian History.

**CO2:** Understand the meaning of archaeology and its different methods used in studying the human prehistory and history.

**CO3:** Acquire knowledge about the prehistory period.

**CO4:** Know about the Harappan culture and understand its importance.

**CO5:** Gain knowledge about the Vedic people, its origin, religion, economy, polity, society, literature, caste system and so on.

**CO6:** Acquainted with the Indian religious movement in the 6<sup>th</sup> century BC particularly Buddhism and Jainism.

### **SEMESTER – II**

**Course Code: HIS 201**

**Course Name: History of the Delhi Sultanate (1200-1556)**

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

**CO1:** Know the different sources of the early Medieval Indian History.

**CO2:** Acquire knowledge about Ghori's conquest of India and its consequences.

**CO3:** Familiarize with the different dynasties of the Delhi Sultanate and its economic policies, political and administrative structure.

**CO4:** Learn about the administration and socio-economic aspects of the Vijayanagar Empire and the Bahamani Kingdom of the South.

**CO5:** Understand the culture of India during 13<sup>th</sup>-16<sup>th</sup> century.

**CO6:** Know the concept of Sufism, its principals, leaders, orders, spread in India.

**CO7:** Know the leaders of the Bhakti movement, its principals, spread and its impact on the people.

### **SEMESTER – III**

**Course Code: HIS 301**

**Course Name: History of Modern India (1600-1857)**

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

**CO1:** Understand the European particularly the Portuguese, Dutch, English and French commercial interest in India.

**CO2:** Know how the British expand and consolidate its power in India by occupying Bengal, Carnatic, Marathas and the Sikhs through different wars.

**CO3:** Understand the British expansionist policy that is the subsidiary alliance system and the doctrine of lapse.

**CO4:** Acquire knowledge about the Structure and Administrative Organization of the British East India Company.

**CO5:** Know the nature, causes, courses and impact of the Revolt of 1857.

### **SEMESTER - IV**

**Course Code: 401**

**Course Name: History of Modern Europe (A.D. 1789-1945)**

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After the completion of the course, students will able to

- CO1:** Trace the development, causes, courses and outcome of the French revolution.
- CO2:** Know the emergence, expansion, consolidation and downfall of Napoleon Bonaparte.
- CO3:** Understand the how and why the Congress of Vienna, 1815 was met and its results.
- CO4:** Acquire knowledge about the social and political development between 1815-1848 in Austria.
- CO5:** Gain knowledge about the unification process of Italy and Germany and will also know about the Liberalism and Democracy in Britain.
- CO6:** Know how the countries of Europe made power block and alliance which led to the causing of World War I.
- CO7:** Know about Fascism and Nazism and also the origin of the World War II.

## **SEMESTER - V**

**Course Code: 501**

**Course Name: History of Ancient India from the 6<sup>th</sup> century BC to 12<sup>th</sup> century AD**

After the completion of the course, students will able to

- CO1:** Gain knowledge about the 16 Mahajanapadas, the rise of Magadha and Republics and Monarchies.
- CO2:** Know the impact of Iranian and Macedonian invasion in India.
- CO3:** Acquire knowledge of how the Mauryan empire was started, expand and how Ashoka consolidate the empire through his Dhamma and the decline of the Mauryan Empire.
- CO4:** Understand about the Khusans, the Sungas, the Satavahanas, and the Guptas Empires. They will also learn about achievements of Harshavardhan.
- CO5:** Know and understand the important dynasties of India that is the Chalukyas, Pallavas, Rashtrakutas, Cholas, Gujara-Pratihara and the Palas.
- CO6:** Understand how the Arab conquest Sindh and its results.

**Course Code: 502**

**Course Name: History of the Mughal India A.D. 1526-1707**

After the completion of the course, students will able to

- CO1:** Know the sources of the Mughal India and the political conditions of North India in 1526.
- CO2:** Know how Babur established the Mughal Empire and the rule of Humayun and Sher Shah.
- CO3:** Acquire knowledge of the problem and difficulties face by Akbar and the regency of Bairam Khan and will also learn Akbar's Rajput and Religious policy.
- CO4:** Understand accession, court politics, religious policy and relation with the Rajputs of Jahangir.
- CO5:** Understand the expansion in the Deccan, relations with Central Asia and Iran during Shahjahan's reign.
- CO6:** Understand the war of succession, religious policy, policy towards the Rajputs and the Deccan of Aurangzeb.
- CO7:** Know about the rise of the Marathas and its struggle with the Mughals.
- CO8:** Acquaint with the Mughal administration and the factors responsible for the decline of the Mughal Empire.

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**Course Code: 503**

**Course Name: History of Indian National Movement (1885-1947)**

After the completion of the course, students will able to

**CO1:** Understand the growth of new ideas and the factors for the rise of Indian nationalism which led to the growth of associations during the second half of the 19<sup>th</sup> century.

**CO2:** Know how the Indian National Congress was formed and its development and split.

**CO3:** Acquire knowledge of the partition of Bengal and the development and process of Swadeshi movement.

**CO4:** Understand the rise of Communalism and the Home Rule Movement.

**CO5:** Know the how the process of Indian national has change with the coming of the Gandhi into the national politics and the different movement launch by the Gandhi.

**CO6:** Understand the how the INA works for the liberation of India from the British rule.

**CO7:** Understand the partition of India.

**SEMESTER - VI**

**Course Code: 601**

**Course Name: History of Manipur from 33 AD to 1891**

After the completion of the course, students will able to

**CO1:** Know the different sources of the history of Manipur.

**CO2:** Make the interpretation of history from different perspectives.

**CO3:** Understand the evolution and expansion of the kingdom of Manipur from the time of Nongda Lairen Pakhangba till Khagemba.

**CO4:** Gain knowledge of how Sanskritisation took place during the reign of Garibniwaz and Bhaigachandra.

**CO5:** Acquire knowledge of treaty of 1762, 7 years devastation in Manipur and the establishment of relationship with the British.

**CO6:** Understand the causes, courses and the consequences of the Anglo-Manipur war, 1891.

**Course Code: 602**

**Course Name: Southeast Asia, 1800-1945**

After the completion of the course, students will able to

**CO1:** Know about the land and the people of the Southeast Asia.

**CO2:** Understand the European interest in the Southeast Asian countries and the pattern of European settlement.

**CO3:** Understand the Dutch colonial interest in Java, British policy in Malaysia and Anglo Burmese relation.

**CO4:** Know how the Spanish, USA and French expand their colonies in Philippines, Laos, Cambodia, Vietnam and China.

**CO5:** Learn about the resurgence of Thailand.

**CO6:** Gain knowledge about the growth of Filipino national movement, Burmese nationalism between the wars, beginning of nationalist agitation in Indo-China (Vietnam) and political movements in Indonesia.

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**Course Code: 603**

**Course Name: History of America**



After the completion of the course, students will able to

**CO1:** Understand why the Americans started the revolution and how they got their independence.

**CO2:** Understand the making of the American Constitution.

**CO3:** Know about the sectional conflicts and civil war of America and the emancipation of slavery.

**CO4:** Gain knowledge of the reconstruction period of America and the emergence of the New South.

**CO5:** Understand the great Economic Depression and New Deal policy and how America entered into the World War II and its consequences.

**NAME OF PROGRAMME: B.A./BSC. HOME SCIENCE**

**Programme Outcome (POs):**

**PO1:** To eliminate mass illiteracy among women and teach them problem solving competencies in life skills in their overall families' health, food and nutrition and other household management.

**PO2:** To enhance quality and standard of living by raising and imparting education to their children in best ways extensively in both rural and urban areas to know work culture and traditions as a whole.

**PO3:** To promote and acquire entrepreneurial skills for economic development for the welfare of the individual self in particular and community in general with all human resources.

**PO4:** To understand and appreciate the role of interdisciplinary science in the development and well-being of individual family and community.

**PO5:** To develop professional skills in textile science, clothing construction, housing, product making and communication technologies and human development.

**Programme Specific Outcomes (PSOs):**

After the completion of the programme, students are expected to

**PSO1:** Be self-reliant with needy proficiencies for a wide variety of career with entrepreneurial skills and placements.

**PSO2:** Know about the establishment of Home make education in schools, training colleges and universities and out of school programmes.

**PSO3:** Be knowledgeable and skilled to become dietician in private and Government health clinics, fitness centres and hospitals.

**PSO4:** Acquire knowledge that is employable in food factories, tourism and hospitality management, textile industries, child care centres, child guidance, family counselling centre etc. with relevant skill oriented courses.

**PSO5:** Empower women and family for problem solving and deal with everyday challenges and difficulties.

**PSO6:** Have focussed knowledge on practical training, exposure through field visits, project works, lectures and demonstrations on areas of food industries, crèche-centres, textile industries, garment construction, home decoration and extensive education fields.

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PSO7: Acquire knowledge of proper decision- making in different household short and long-term goals in proper managerial processes with available resources.

PSO8: Garner knowledge in interior and furniture designer, colour consultants, event manager, kitchen planners and designers, hotel management, gardening, rangoli, and flower arrangement, floor decoration, etc.

### Course Outcomes (Cos)

#### SEMESTER – I

Course Code: HS (E) 101

Course Name: Food and Nutrition

#### Course Objective:

- To gain knowledge about food and nutrition, food preparation and food groups, nutritional requirements, meal planning, food habits and nutrition education and study of energy.

On completion of the course, students will be able to

**CO1:** Know about the functions, classifications, sources of food, nutrition and its relation to health and well-being, balanced diet and metabolic activities in human body.

**CO2:** Acquire awareness about food preparation methods, basic food groups, consumer protection and about food legislation and standard of products.

**CO3:** Gain knowledge about meal planning, nutritional requirements of different stages of human life.

**CO4:** Know about the food adulteration, malnutrition, nutrition education, and about national organisations like ICAR, ICMR etc. and international organisations like FAO, WHO, UNICEF and CARE in community nutrition and health sectors.

**CO5:** Aware of the physiological fuel values, BMR and body energy requirements for different persons –women and men.

Course Code: HS (E) 101 P

Course Name: Food and Nutrition (Practical)

#### Course Objective:

- To find out deficiency symptoms of various malnutrition, planning meals for different age groups,
- To measure weight and height of students by comparing the standards.

After completion of the course students are expected to

**CO1:** Gain knowledge about deficiency symptoms of various deficiency diseases.

**CO2:** Acquire knowledge about the calculation of food (cost of meals planned for different age-groups)

**CO3:** Aware about the normal weight and height of different age-groups in comparison with standards.

#### SEMESTER – II

Course Code: HS (E) 202

Course Name: Family Resource Management

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### Course Objective:

- To make aware about the principle knowledge of house planning, management of resources, decision making, interior decoration and household equipment.

After the completion of this course students will be able to

**CO1:** Acquire knowledge about the principles and planning of house for different income groups like different rooms, and kitchen plans etc.

**CO2:** Gain knowledge about the management processes, stages of family life cycles, family types and life stages.

**CO3:** Gain knowledge about goal setting and making decisions of life – short and long terms with available resources.

**CO4:** Gain awareness about the interior decoration, colour schemes, flower and floor arrangements, lighting in the house

**CO5:** Gain knowledge about the different equipment like – Oven, Refrigerator, Washing Machines, Vacuum-Cleaner, solar cooker etc.

**Course Code: HS (E) 202 P**

**Course Name: Family Resource Management (Practical)**

### Course Objective:

- To gain knowledge about house plans, kitchen shapes, flower and floor arrangements.
- To study the work culture for Rural and Urban life styles and their flower and floor arrangements.

After the completion of this course students will be able to

**CO1:** Gain knowledge about the house plans, diagrams of different kitchen shapes.

**CO2:** Understand flower and floor arrangements like rangoli, mass management etc.

**CO3:** Aware about the work culture of Rural and Urban families.

**CO4:** Gain knowledge about using of different types of household equipments like – pressure cooker, fridge, washing machine etc.

### SEMESTER – III

**Course Code: HS (E) 303**

**Course Name: Human Development**

### Course Objective:

- To make students understand the stages of human development, different developmental patterns.
- To make aware about the children with special needs.
- To acquire knowledge about the child welfare services.

On completion of the course students will be able to

**CO1:** Understand the principles of different stages of human development and developmental stages.

**CO2:** Acquire knowledge about characteristics, developmental task of different stages of life, programme planning of nursing school.

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- CO3: Gain knowledge about the educational provisions of exceptional children.
- CO4: Aware of the child welfare working services like WHO, UNICEF, UNESCO, FAO etc.

**Course Code: HS (E) 303 P**

**Course Name: Human Development (Practical)**

**Course Objective:**

- To understand the anthropological measurements of human body.
- To make aware of the programmes and lesson plans of nursery schools.

After the completion of this course students will be able to

CO1: Acquire knowledge about the anthropometric measurement of infants.

CO2: Gain knowledge about the different programmes, activities and plans of nursery schools.

CO3: Aware of the exceptional children, needs, and provisions by visiting them in the institutions

CO4:

**SEMESTER – IV**

**Course Code: HS (E) 404**

**Course Name: Textile and Clothing and Home Science Extension**

**Course Objective:**

- To understand the textile fibres, weaving and stitches.
- To understand the textile fibres, weaving and stitches.
- To make aware of the knowledge of fashion designing and garment technology.
- To acquire knowledge about extension education concepts and communication processes.
- To know the extension teaching methods and different aids.

After the completion of this course students will be able to

CO1: Understand the classification of textile fibres and its properties and yarn spinning.

CO2: Acquire knowledge about the weaving processes, woven and decorative fabrics and embroidery stitches.

CO3: Aware about the fashion merchandising sales and marketing, pattern making principles and its application for different garments.

CO4: Understand about extension education, communication models, techniques of motivation in extension work

CO5: Gain knowledge about the selection of effective teaching methods, appropriate teaching aids and acquired knowledge of adult education.

**Course Code: HS (E) 404 P**

**Course Name: Textile and Clothing and Home Science Extension (Practical)**

**Course Objective:**

- Aim to understand different fabrics by different identification method

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- To study basic and embroidery stitches in practicals.
- Drafting and stitching knowledge of different garments.
- Aim to handle and operating of OHP.



After the completion of this course students will be able to

**CO1:** Acquire knowledge of different fibre identification with different methods.

**C22:** Gain knowledge of drafting and stitching of different garments.

**CO3:** Aware of the knowledge of different adult education centres by visiting the centres.

**CO4:** Understand handling and operation of OHP (Overhead Projector)

#### **SEMESTER – V**

**Course Code: HS (E) 505**

**Course Name: Food Science and Nutrition**

#### **Course Objective:**

- To study about Food Microbiology and diet therapy.
- To understand weight management and diabetic mellitus.
- To make aware about human nutrition and modes of feeding during emergencies.

After the completion of this course students will be able to

**CO1:** Understand the principles of food spoilage and preservation and its methods.

**CO2:** Acquire knowledge about diet therapy like normal diet, diet for different gastro-intestinal disorders.

**CP3:** Aware about the weight management of diabetic mellitus, overweight, obesity etc.

**CO4:** Gain knowledge about human nutrition, modes of feeding diet management of different persons.

**Course Code: HS (E) 506**

**Course Name: Family Resource and Management**

#### **Course Objective:**

- To make aware about the management of resources.
- To make aware about the management of resources.
- To study about consumer education, its aims and purposes.
- To understand the management principles and its application to experimental house.

After the completion of this course students will be able to

**CO1:** Acquire knowledge about the time plans, management of energy and money.

**CO2:** Understand consumer problems faced in rural and urban areas

**CO3:** Aware of food adulteration, consumer information, and aids and, buying practices.

**CO4:** Gain knowledge about work simplification through menu planning

**Course Code: HS (E) 507**

**Course Name: Food Science and Nutrition, Family Resource Management Planning (Practical)**

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### Course Objective:

- To study about the preparation and calculation of different meals.
- To understand preparation and evaluation of therapeutic diet.
- To acquire knowledge about planning, preparation and calculation of therapeutic diets.
- To understand preparation of budget of a family.
- To make aware of the knowledge of consumer problems, practices in weight and measures

After the completion of this course students will be able to

**CO1:** Aware about the preparation of jam, sauce, pickles and squash

**CO2:** Understand the planning, calculation and preparation of meals for different age-groups.

**CO3:** Acquire knowledge about the preparation and evaluation of therapeutic adaptation to the normal diets and related to disorders.

**CO4:** Study of the planning and calculation of different disorders like peptic ulcer, diarrhoea, constipation, fever and renal disorders.

**CO5:** Understand the planning of family budget.

**CO6:** Aware of the knowledge to consumer about food adulteration

**CO7:** Acquire knowledge about the principles of interior decoration, housing and household equipment.

### SEMESTER – VI

**Course Code: HS (H) 608**

**Course Name: Adolescence, Dynamics of Marriage and Counselling**

### Course Objective:

- To understand about Adolescence and Adulthood period.
- To understand about marriage and family, guidance and counselling, intervention programme for family and community.

After the completion of this course students will be able to

**CO1:** Understand the developmental tasks, sex role typing, sex education

**CO2:** Acquire knowledge about the adulthood characteristics, adjustment to physical changes, and adjustment to retirement.

**CO3:** Gain knowledge about marriage and family, marital adjustments, divorce and awareness of planning for parenthood, parent and child relationship, husband and wife relationship.

**CO4:** Understand about guidance and counselling and its techniques.

**CO5:** Awareness of intervention programme for family and community, family life education.

**Course Code: HS (H) 609**

**Course Name: Textile and Clothing and Home Science Extension**

### Course Objective:

- To understand dyeing, printing and finishing.
- To understand about Indian traditional textiles and embroidery.
- To acquire knowledge of stain removal and laundry.
- To study theories of leadership, social survey and social organization.

After the completion of this course students will be able to

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- CO1:** Understand the knowledge of dyeing, printing and finishing methods.  
**CO2:** Aware of Indian traditional textiles and embroideries.  
**CO3:** Acquire knowledge of principles and techniques of stain removal, reagents used for various stains.  
**CO4:** Understand the principles and equipment of laundering processes for different fabrics.  
**CO5:** Gain knowledge about theories of leadership in extension, Panchayati Raj concepts, structures and functions.  
**CO6:** Understand about the importance of social survey, tools of data collection, development programmes like IRPD, ICDS, NAEP, DWACRA and TRYSEM.

**Course Code: HS (H) 610**

**Course Name: Human Development, Textile and Clothing and Extension Education**

**Course Objective:**

- To understand the problems of adolescents, old age by visiting the homes.
- To make awareness of the Indian traditional textiles and embroidery.
- To study the dyeing and printing methods in practice.

After the completion of this course students will be able to

- CO1:** Acquire in-depth knowledge regarding counselling, marriage and family problems.  
**CO2:** Understand the problems faced by old-age and adolescents.  
**CO3:** Awareness about the knowledge of India textiles and embroideries  
**CO4:** Understand about village life conducting social survey.  
**CO5:** Study problems exist in the colleges of Manipur offering Home Science and lack of infrastructures in them by giving visits to such institutions.

**NAME OF PROGRAMME: B.A. MANIPURI**

**Programme Outcome (POs):**

- PO1:** To develop reading and writing skill of Meitei mayek which replaced the Bengali script from 2017-2018 Session  
**PO2:** To increase the critical attitude about Manipuri Literary writings in poem, prose, play, novel and short stories  
**PO3:** To learn the importance of translation in Manipuri literature, the history of Manipuri literature, culture, folkloristic and Manipuri folklore  
**PO4:** A depth study of Grammar and linguistic aspects of Manipuri language

**Programme Specific Outcomes (PSOs):**

- PSO1:** Understand the basics of Grammar, composition and comprehend certain forms of literature like poem, prose, novel, drama and short story  
**PSO2:** Understand linguistics and Manipuri literature  
**PSO3:** Apprehend the translation of Indian Literature  
**PSO4:** Knowledge of History of Manipuri literature  
**PSO5:** Knowledge of development of Ancient Manipuri Literature  
**PSO6:** Knowledge of Manipuri Culture, Folkloristic and Manipuri folklore

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**Course Outcomes (COs)**

**SEMESTER – I**

**Course Code: 101**

**Course Name: (Poems and Grammar- Chand Alankar)**

**CO:** After completion of this course students will be able to appreciate the works of poets and writers of Manipuri literature - Lamabam Kamal, Khwairakpam Chaoba, Elangbam Nilkanta, Laishram Somrendra, Sri Biren)

**SEMESTER – II**

**Course Code: 202**

**Course Name: Drama, Novel and Short Story**

**CO:** After completion of this course students will be able to understand and appreciate the works of Khwairakpam Chaoba, Hijam Anganghal, MK Binodini, Lamabam Birmani Singh, Elangbam Dinamani Singh, Keisam Priyokumar Singh)

**SEMESTER – III**

**Course Code: 303**

**Course Name: Introduction to Linguistics and Manipuri language**

After completion of this course, students will be able to understand

**CO1:** Definition, theory of origin of language, Animal and human communication

**CO2:** Descriptive, Historical and comparative Linguistics

**CO3:** Phonology and Morphology

**CO4:** Manipuri language- Vowel, Consonant, Diphthong, tone, word formation, sentence types- simple, complex and compound

**SEMESTER – IV**

**Course Code: 404**

**Course Name: Discussion of Literature**

After completion of this course students will be able to acquire knowledge about:

**CO1:** Poetry cult and epics of Indian Literature

**CO2:** Criticism of western literature-ancient (Aristotle)

**CO3:** Works of Wordsworth on Romantic - Criticism, works of St Coleridge, TS Eliot

**SEMESTER – V**

**Course Code: 505**

**Course Name: Epics and drama of Manipuri Literature**

After completion of this course students will be able to

**CO1:** Learn about epics of Manipur titled K”hamba Thoibi” and “Khongjom Tirtha”

**CO2:** Know about Manipuri drama titled “Judge Sahebki Imung” (meaning the family of Judge Saheb) and “Tamna”

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**Course Code: 506**

**Course Name: Indian literature translation**

After completion of this course students will be able to

**CO:** Learn about the short story of Indian literature namely “Bolramgi thawai, Awabagi marup nungaiba, Pukchel chaobagi dandi, Maithibagi Jai; Karn-Kunti wari sanaba (Karna-kunti concersation), Madhusala, Brischiki ahing

**SEMESTER – VI**

**Course Code: 507**

**Course Name: History of Manipuri Literature**

After the completion of the course students will be able to understand and appreciate the

**CO1:** Works of Hijam Anganghal, Nilabir Sharma, Arambam Somrendra, Haobam Tomba

**CO2:** Knowledge of Manipuri language and ancient Manipuri literature

**CO3:** Works of Elangbam Dinamani, Shyamsunder Singh

**SEMESTER – VI**

**Course Code: 608**

**Course Name: Ancient Manipuri Literature**

After completion of this course students will be able to

**CO:** Learn about the ancient Manipuri literature namely “Numit kappa by O. Bhogeshor Singh; “Chothe Thangwai Pakhangba” by N. Khelchandra Singh, “Tutenglon” by N. Manaoyaima Singh, and “Chandrakirti jilla Changba” by Bhogeshor Singh

**Course Code: 609**

**Course Name: Manipur Culture**

After the completion of the course students will be able to

**CO1:** Know the meaning of Culture; identify the boundary, profession, etc. of Manipur

**CO2:** Know about the economic, commercial, transportation of Manipur

**CO3:** Identify the religious belief in the 18<sup>th</sup> and 19<sup>th</sup> century; influence of Indian culture in Manipur culture

**CO4:** To learn about culture, games and sports like polo, *Yubi lakpi*, Boat Race (*hiyang tanaba*)

**CO5:** To understand about housing, dressing, art, sculpture, etc.

**Course Code: 610**

**Folkloristic and Manipuri Folklore**

**CO:** After the completion of the course students will be able to acquire knowledge about the definition of Folklore Nature, Scope and Function, Folklore Theories and Folklore Field Method and the Manipuri Folklore

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**NAME OF PROGRAMME: B.A. / B.SC. MATHEMATICS**



**Programme Outcome (POs):**

By the end of a BA/B.Sc. program, a student will able to:

- PO1:** Analyze, interpret and form independent judgment in both academic an non-academic contexts.
- PO2:** Possess basic subject knowledge required for higher studies, professional, applied courses like management studies etc.
- PO3:** Exhibit positive attitudes and values toward the discipline, so that they can contribute to an increasingly complex and dynamic society.
- PO4:** Become employable either in Govt. or Private; they will be eligible for career opportunities in Companies, Industries or will be able to opt for entrepreneurship.
- PO5:** Acquire basic practical skills and technical knowledge along with domain knowledge of different subjects in the Science.
- PO6:** Recognize and appreciate the connections between theory and applications.
- PO7:** Develop scientific temper.
- PO8:** Develop communication skills effectively in English, regional and national language.

**Programme Specific Outcomes (PSOs):**

By the end of BA/ B.Sc. program in Mathematics, a student will able to:

- PSO1:** Think in critical manner and communicate clearly mathematical concepts and solutions to real-world problems.
- PSO2:** Recognize what constitutes mathematical thinking, including the ability to produce and judge the validity of rigorous mathematical arguments.
- PSO3:** Acquire good knowledge and understanding to solve specific theoretical and applied problems in advanced areas of mathematics and statistics.
- PSO4:** Be able to formulate and develop mathematical arguments in a logical manner.
- PSO5:** Identify suitable existing methods of analysis, if any, and assess his/her strengths and weaknesses in the context of the problem being considered.
- PSO6:** Gain sufficient knowledge and skills enabling them to undertake further studies in mathematics and its allied areas on multiple disciplines concerned with mathematics.
- PSO7:** Develop a positive attitude towards mathematics as an interesting and valuable subject of study.
- PSO8:** Develop the skills necessary to formulate and understand proofs and to provide justification.
- PSO9:** Encourage the students to develop a range of generic skills helpful in employment, internships and social activities.
- PSO10:** Be a life-long learner who is able to independently expand his/her mathematical or statistical expertise when needed.
- PSO11:** Equipped with mathematical modeling ability. Problem solving skill, creative talent and power of communication necessary for various kinds of employment and other contexts.

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## Course Outcomes (COs)

### **SEMESTER – I**

**Course Code: BMath: 101**

**Course Name: Algebra - I**



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

**CO1:** Understand the fundamental theorem of Algebra, Define Geometric and Arithmetic mean, find the relationship between them, solve problems on them; state and prove Cauchy-Schwarz, Holder's and Minkowski's inequalities; solve the problems of Inequalities; understand Descartes rule of signs and Fundamental theorem of Algebra; relation between roots and coefficients; and find solution of cubic equations by Cardan's method and biquadratic equations by Ferrari's method.

**CO2:** Learn about infinite series; Cauchy's general principle for convergence examples for convergence and divergence series; different test of convergence and divergence of p-series; and Conditional and Absolute convergence, and verify the given series in either convergent or divergent by using different test.

**CO3:** Know about mappings, Equivalence relations and partitions, Congruence modulo n; Group and Sub-groups, their properties and types, order of a group permutation, Lagrange's theorem, Cayley's Theorem, etc.

**CO4:** Learn about Matrices, types and its elementary operations, Inverse of a matrix, Cayley Hamilton theorem and its use in finding inverse of a matrix

**CO5:** Learn about De Moivre's theorem and its applications; different types of functions and its basic operations.

### **SEMESTER – II**

**Course Code: BMath: 202**

**Course Name: Calculus and Ordinary Differential Equations**

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

**CO1:** Learn about differentiation - Limit and continuity of the functions, Check the existence of limit and continuity of given functions; Rolle's Theorem, Lagrange's and Cauchy's Mean Value theorems, Taylor's and Maclaurin's theorem with Lagrange's and Cauchy's form of remainders, Indeterminate forms, L-Hospital's rule, Expansion of standard functions

**CO2:** Understand about Partial differentiation, Euler's theorem on Homogeneous functions of two and three variables, Maxima and Minima of functions of two variables and applications of partial derivatives to find Curvature, radius of curvature for the Cartesian, parametric, implicit and polar equations and Asymptotes.

**CO3:** Know about integration, its fundamental theorems and applications.

**CO4:** Have working knowledge of double integrals, Jacobian, change of variable in double integrals, Application of double integral and its application.

**CO5:** Write the integrating factors and conditions for Exactness of first order and first degree equations. Extract the solution of first order and first degree differential equations and equations reducible to linear form by variable separable, homogeneous and non-homogeneous methods. Solve simultaneous linear equations with constant coefficients and total differential equations. Understand different methods of solutions and their geometrical interpretations as well as orthogonal trajectory. Find a solution of differential equations of first order and of higher degree; Find a solution of linear

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second order differential equations; Compute complementary functions and particular integrals of linear second order differential equations.



### **SEMESTER – III**

**Course Code: BMath: 303**

**Course Name: Vector, Geometry and Probability**

Students will able to:

**CO1:** Write formulae for Scalar and vector products; solve their problems; find and interpret the Gradient, Divergence and Curl of a vector function; and evaluate integrals by using Gauss's, Green's and Stoke's theorems.

**CO2:** Learn about two-dimensional Geometry and application –pair of straight lines, system of conics, confocal conics and their properties.

**CO3:** Learn about three-dimensional Geometry – cone, cylinder, central conicoids, confocal conicoids, paraboloids, etc. their equations and properties.

**CO4:** Learn about various probability distributions, characteristics, theorems and applications.

### **SEMESTER – IV**

**Course Code: BMath: 404**

**Course Name: Mechanics (Dynamics, Statics, Rigid Dynamics)**

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

**CO1:** Know about Dynamics - components of velocities and accelerations; simple Harmonic motions; motion; and acceleration in different coordinate system.

**CO2:** Learn about statics – equilibrium conditions of different situations like Equilibrium condition of co-planner forces, Equilibrium of strings, stable and unstable equilibrium, etc.

**CO3:** Understand about dynamics of rigid bodies - Moments and products of inertia, Momental Ellipsoid, D'Alembert's Principle, Motion of centre of inertia, Motion in 2 dimension, Conservation of momentum and Energy.

### **SEMESTER – V**

**Course Code: BMath: 505**

**Course Name: Abstract Algebra and Linear Algebra**

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


**CO1:** Define Normal subgroups, Quotient Groups Homomorphism, Isomorphism and Auto-morphism of groups and Kernel of a homomorphism; Solve the problems related with normal subgroups, Homomorphism, Isomorphism, Auto-morphism of a group; Prove Isomorphism theorems and Cayley's theorem, the fundamental theorem of homomorphism for groups;

Define Conjugacy relation, Conjugate class, Counting principle, Class equation of a finite groups, Normalizer, Centralizer and prove related theorems; Prove and use Cauchy, Sylow and p-Sylow theorems to characterize certain finite groups and subgroups.

**CO2:** Understand the basic concepts of Rings and their elementary properties.

**CO3:** Understand the concepts of Vector Spaces, Subspaces, Basis, Dimension, Linear Dependence and Linear Independence and their properties.

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**CO4:** Prove and solve theorems and problems associated with Inner Product Spaces.



**Course Code: BMath: 506**

**Course Name: Analysis – I (Real Analysis)**

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

**CO1:** Understand statement of Order completeness in  $\mathbb{R}$ ; Archimedean property, Theorems of Open and Closed Sets, Limit Points and Heine-Borel theorem.

**CO2:** Understand types of discontinuities, properties of continuous functions on a closed interval and Uniform continuity.

**CO3:** Improper Integrals and types and problems of Improper Integrals.

**CO4:** Derive Beta and Gamma functions and their relations.

**CO5:** Derivative formula for functions of several variables and Partial derivatives of higher order. Solve problems of higher order derivatives, partial derivatives and derivatives of function of functions.

**CO6:** Solve Line integrals, Double integral by directly and by change of order of integration, Surface area and volume of any given problem.

**Course Code: BMath: 507**

**Course Name: Numerical Analysis and Computer Programming in C**

After completion of the course, it is expected to enable the students to,

**CO1:** Learn about Finite difference, relation between the operators, ordinary and divided differences, Newton's forward and Backward interpolation formulae, Newton's divided difference formulae and their properties, Lagrange's and Hermite's interpolation formulae, Least square polynomial approximation

**CO2:** Understand about numerical differentiation and integration, Trapezoidal rule, Simpson's rule, System of linear algebraic equation using Gauss elimination method

**CO3:** Gain the knowledge of Basic model of a computer, Algorithm, Flow Chart, Programming language, Compilers and operating system, Character set, Identifiers and keyword etc. which are terms require for studying C-programming; understand conditional statements and loops.

**CO4:** Understand about arrays such as declaration and initialization of one-dimensional arrays, insertion and deletion of an element from an array, sorting an array and two-dimensional arrays.

#### **SEMESTER-VI**

**Course Code: BMath: 605**

**Course Name: Partial Differential Equations, Laplace Transform, Calculus of Variation**

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

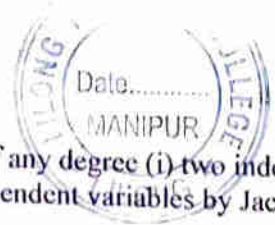
**CO1:** Understand origin of Partial Differential Equations (PDE) and use of Lagrange's method in solving PDE, solve Cauchy's problem of first order equation, and define complete Integral, Particular Integral, Singular Integral and General Integral of PDE, solve standard forms of non-linear PDE

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**CO2:** Understand and solve PDEs of first order but of any degree (i) two independent variables by Charpit's method (ii) three or more independent variables by Jacobi's method.

**CO3:** Understand higher order PDS (constant coefficients only) and origin of second order equations; Find the solution of linear homogeneous PDE with constant coefficients.

**CO4:** Define Laplace transformations and Kernel of the Integral transformation – properties, application of some elementary functions.

**CO5:** Understand Fundamental theorem on Calculus of Variation, Necessary and sufficient condition for extremum of higher order variations, Legendre condition for extremum and Extension of the variational case.

**Course Code: BMath: 606**

**Course Name: Analysis – II [Metric Space & Complex Analysis]**

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

**CO1:** Define Metric space, Diameter and boundedness of sets, Distance between two subspace, Open spheres, Open sets, Closed sets, neighbourhood of a point, limit points, adherent point, Interior, Exterior and Frontier points, closure of a set and dense subsets.

**CO2:** Define Metric space, Diameter and boundedness of sets, Distance between two subspace, Open spheres, Open sets, Closed sets, neighbourhood of a point, limit points, adherent point, Interior, Exterior and Frontier points, closure of a set and dense subsets.

**CO3:** Understand Compact metric spaces, Sequential Compactness, Bolzano Weirstrass property, totally boundedness, and Finite intersection property, Equivalence among the kinds of compactness, Continuous functions and compact sets.

**CO4:** Derive the necessary and sufficient condition for a function  $f(z)$  to be analytic, Method of constructing a regular function, Polar form of Cauchy-Riemann equations and Complex equations of a straight line and circle.

**CO5:** Define Jacobian of transformation, Conformal mapping, Bilinear transformation and fixed points; Problems of conformal mapping, Bilinear transformation and circles and straight lines under bilinear transformation.

**SEMESTER-VI Course Code: B.Math 60705**

**Course Name: Spherical Trigonometry and Astronomy (Optional Paper)**

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

**CO1:** Digest with the concepts of spherical angle & triangle; properties of polar and spherical triangles, derive Sine, Cosine, Four parts, Sine cosine, Cotangent formulae and Nepler's and Delambre's analogies; write right angled spherical triangle, formulae relating to the right spherical triangles, areas of spherical triangle and polygon.

**CO2:** Define Celestial Sphere, Celestial horizon, pole, Equator, meridian, Zenith and Nadir, Azimuth, Hour angle, Ecliptic etc. which associates with astronomy.

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**CO3:** Derive Cassini's hypothesis, Simpson's hypothesis, Bradely formula; describe effect of refraction (i) on sunrise and sunset, (ii) the right ascension and declination of a star, (iii) in the distance between two neighbouring stars and (iv) on the shape of the disc of the Sun; define Precession and Nutation; describe physical causes of Precession, Nutation and Precession and Nutation both on the right ascension and declination of a star.

**CO4:** Define Aberration and Parallax; describe annual aberration in (i) ecliptic longitude and latitude (ii) right ascension and declination of a star and Diurnal aberration in (i) hour angle and declination (ii) zenith distance and azimuth; describe Geocentric parallax in (i) right ascension and declination (ii) the distance between two planets (iii) azimuth and zenith distance and annual parallax in (i) latitude and longitude (ii) right ascension and declination.

**CO5:** Write Synodic and orbital period and Kepler's laws; deduce Kepler's laws from Newton's laws of Gravitation.

### **NAME OF PROGRAMME: B.A. PHILOSOPHY**


#### **Programme Outcome (POs):**

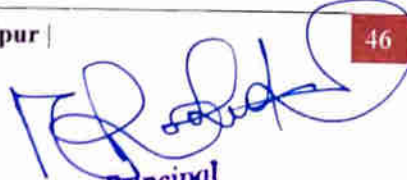
- To introduce students to the great philosophers of both Indian and Western and their ideas, and also imbibes them of how to think of the contemporary problems through the lens of their theories.
- It is intended to enable the students to explore Philosophy of logic, moral philosophy, philosophy of religion, etc.
- This would enable the students of B.A. Philosophy to get acquaintance with the use of logical rules for identifying a valid argument, constructing formal proof of validity, proving invalidity, Quantification theory.
- Inculcate the students with critical thinking to carry out philosophical investigation objectively without being biased with preconceived notions

#### **Programme Specific Outcomes (PSOs):**

Upon completion of the programme, students are intended to

- Learn about Greek philosophy, Indian philosophers as well as western philosophers
- Acquaint with the use of logical rules for identifying a valid argument, constructing formal proof of validity, proving invalidity, etc.
- Develop the ability to think logically, to analyse and solve problems, to assess proposed solutions, to write and speak clearly, etc.
- Enrich one's thinking skill and sharpens one's analytical abilities.
- Helps students to gain their ability to make moral judgement and helps in making themselves to become a proper social being.
- Improve reasoning and critical skills, teaches how to put good questions properly
- Understand the nature and scope of philosophy of religion, attributes of God, his relationship to man and the world, and also of the substitutes for religion.
- Learn about Greek Political philosophy namely the philosophies of Plato, Aristotle, Hobbes, Locke, Rousseau, JS Mill, Karl Marx, etc.

  
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## Course Outcomes (COs)

### **SEMESTER – I**

**Course Code: E1-101**

**Course Name: Greek Philosophy**



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

**CO1:** Learn about the contributions of Thales in the field of Philosophy

**CO2:** Know about Heraclitus, the Atomists, the Sophists, etc

**CO3:** Understand about the Socrates and its methods

**CO4:** Learn about Plato and his ideas,

**CO5:** Learn about Aristotle, criticism of platonic theory of ideas, metaphysics, etc.

### **SEMESTER – II**

**Course Code: E1-202**

**Course Name: Indian Philosophy I**

On completion of this course, students are expected to

**CO1:** Learn about the meaning and scope of Indian Philosophy, characteristics of Indian schools

**CO2:** Learn about Carvaka, Jainism and Buddhism,

**CO3:** Understand about schools of Buddhism - Madhyamika and Vaibhasika

### **SEMESTER – III**

**Course Code: E1-303**

**Course Name: Logic**

After the completion of this course, students will be able to

**CO1:** Know about the nature and premises and conclusions of logical argument and diagrams representing them

**CO2:** Learn about sentences and propositions, distinction between a proposition and a sentence

**CO3:** Know about the various formal concepts of logic –forms and matter; variables and types; Functions and types; arguments form, methods of proving the validity of proving

**CO4:** Learn about the methods of deduction – formal proof of validity, rule of conditional proof, rule of indirect proof, proving of invalidity

### **SEMESTER – IV**

**Course Code: E1-404**

**Course Name: Moral Philosophy**

After the completion of this course, students will be able to

**CO1:** Know about the nature and scope of ethics

**CO2:** Learn about moral and non-moral actions, nature and object of moral judgement

**CO3:** Understand the theories of moral standard – naturalistic & non-naturalistic ethics; Hedonism; Utilitarianism; Intuitionism

**CO4:** Learn about moral law as a law of reason, Kant's ethical theory

**CO5:** Know about value of life, theories of punishment, expression of dissent, moral attitude to environment and animals

**SEMESTER – V**

**Course Code: H-505**

**Course Name: History of Western Philosophy I**



After the completion of this course, students will be able to

- CO1: Learn about the characteristics and stages of Scholasticism
- CO2: Know about the philosophies of St. Augustine and Thomas Aquinas
- CO3: Know about Descartes; relationship between body and mind
- CO4: Understand about Spinoza, Leibnitz, etc.

**Course Code: H-506**

**Course Name: History of Western Philosophy II**

After the completion of this course, students will be able to know about Western philosophers like Locke, Berkley, Hume, Kant and Hegel and their important ideas

**Course Code: H-507**

**Course Name: Contemporary Western Philosophy**

After the completion of this course, students will be able to

- CO1: Know about ideal language and ordinary language debate, ordinary language philosophy, early realism, logical atomism, logical positivism, etc.
- CO2: Understand about various methods of philosophical analysis like analysis of language, common sense, approach, application of logic in philosophy
- CO3: Understand about various theories of meaning by Frege, Russell, Wittgenstein, and about verification theory of meaning
- CO4: Learn about logical positivism and existentialist movements

**SEMESTER – VI**

**Course Code: H-608**

**Course Name: Indian Philosophy II**

Once the course is completed, students are expected to know about various philosophical systems of Indian origin like Nyaya, Vaishesika, Sankhaya-Yoga, Mimamsa, and Vedanta.

**Course Code: H-609**

**Course Name: Philosophy of Religion**

Once the course is completed, students will be able to

- CO1: Know the nature and scope of philosophy of religion, its origin and development
- CO2: Learn about nature and attributes of God, personalities of God and the proof for existence of God, etc.
- CO3: Learn about God and His relation to the world and man
- CO4: Understand about the problems of evil, destiny of man, immortality of the self
- CO5: Know about substitutes of religion –materialism, Marxism and Freudianism

**Course Code: H-610**

**Course Name: Political Philosophy**

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Once the course is completed, students will be able to

- CO1: Understand about the political philosophies of famous Greek philosophers like Plato and Aristotle
- CO2: Learn about political philosophies of Hobbes, Locke and Rousseau
- CO3: Understand about political philosophy of JS Mill and Karl Marx
- CO4: Know about Rawls' theory of justice – main idea of theory of justice, distinction between Utilitarian and Contractarian theory of Justice

## **NAME OF PROGRAMME: POLITICAL SCIENCE**

### **Programme Outcome (POs):**

- To provide a firm grounding in the Subject, imbibe analytical skills and to develop a realistic and pragmatic perspective on the local, national, regional and international issues
- To enable the students know about their constitutional rights and duties and also aware of the way how government functions in their own state/countries and in other states/countries.

### **Programme Specific Outcomes (PSOs):**

- To learn about the basics of political theory
- To know western political thought as well as Indian political thought
- To understand about Indian political system
- To acquire knowledge about different political system in the world
- To learn about international politics
- To understand the politics of North East India
- To study Gandhian thought

### **Course Outcomes (Cos)**

#### **SEMESTER – I**

**Course Code: 101**

**Course Name: Political Theory**

After completion of the course, students are expected to

- CO1: Know the nature and scope of political theory
- CO2: Learn about the theories of State, its purpose and its limitations
- CO3: Learn about democracy - concepts and kinds, basic concepts of Liberty, Equality, Rights and Duties.
- CO4: Understand the different principles - Socialism, Communalism, Liberalism and Fascism.
- CO5: Know about modern political theory - behaviouralism and Post-Behaviouralism, political culture and political socialisation.

#### **SEMESTER – II**

**Course Code: 202**

**Course Name: Western Political Thought**

After completion of the course, students are to know about

- CO1: Plato's theory of ideal state, theory of justice, nature of education, theory of communism and philosopher king.

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- CO2:** Aristotle's - origin of state, theory of justice, nature of citizenship, causes of slavery and revolution
- CO3:** The important basic principles of Machiavelli, Bodin and their contributions
- CO4:** Hobbes, Lock and Rousseau's contributions
- CO5:** The contributions of Hegel (dialectics and state), Marx (dialectical materialism & materialistic interpretation of history) and Lenin (theory of imperialism)



### **SEMESTER – III**

**Course Code: 303**

**Course Name: Indian Government and Politics**

On completion of the course students will be able to

- CO1:** Know the socio-historical background of India's freedom struggle
- CO2:** Understand the constitutional structure of India
- CO3:** Learn about Centre-State relationship, Planning Commission, Panchayati Raj and women empowerment
- CO4:** Understand about the party system, political behaviour, caste and politics
- CO5:** Learn about communalism, role of regionalism in Indian politics, regionalism and importance of national integration of a country.

### **SEMESTER – IV**

**Course Code: 404**

**Course Name: Comparative Government and Politics**

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

- CO1:** Understand the Sources of the British Constitution, parliamentary government of United Kingdom and British Monarchy system, British Cabinet and parliament and political parties of United Kingdom
- CO2:** Understand the American Federal system of constitution and American Government agencies like - President, Congress, Supreme Court, separation of powers and checks and balances, political parties
- CO3:** Learn about the Emperor of Japan, the constitution of 1947, system of Diet., different political parties and factional politics in Japan.
- CO4:** Understand about the Constitution of People's Republic of China, Cultural Revolution in China, Political system in China and National People's Congress
- CO5:** Understand the federal system of constitution in Switzerland, different agency of Swiss-Government - Legislature, Referendum, Initiative, Recall and Political Parties.

### **SEMESTER – V**

**Course Code: 505**

**Course Name: International Politics**

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

- CO1:** Explain the nature and scope of International politics, systems and its theories
- CO2:** Analyse national power - components and limitations; balance of power – its principles and methods
- CO3:** Understand the League of Nations, its structure and functions, causes for the failure.

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**CO4:** Understand the factors influencing Indian Foreign policy and basic principles of India's Foreign policy.

**CO5:** Know about key issues of Indian Foreign policy such as Kashmir issue, causes of Sino-Indian war of 1962 and its impact, US stand on Sino-Indian War of 1962, Indo-Pak Wars of 1965 and 1972, and Soviet stand on Sino-Indian war of 1962, Indo-Pak wars of 1965 and 1971

**Course Code: 506**

**Course Name: International Politics**

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

**CO1:** Understand the Utopian Socialism - main ideas of Robert Owen and Charles Fourier

**CO2:** Understand the main ideas of Marx, Engels and Lenin

**CO3:** Know about Stalin and Mao

**CO4:** Understand the Mao's theory of revolution and Cultural revolution

**CO5:** Know the main principles of Anarchism and Fascism.

**Course Code: 507**

**Course Name: Public Administration**

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

**CO1:** Know about meaning, nature and scope of public administration, relationship between politics and public administration

**CO2:** Know about the working of administrative organisation, hierarchy, command, control and leadership; power, function and responsibilities of chief executive

**CO3:** Learn about administrative units; department and corporation; centralisation and decentralisation; and field – headquarters relationship

**CO4:** Know about personnel administration, civil service commission, recruitment and training and administrative accountability

**CO5:** Know about agencies of financial administration, budget making principles, Comptroller and Auditor General of India, Power and functions

**SEMESTER – VI**

**Course Code: 608**

**Course Name: Government and Politics of North East India**

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

**CO1:** Know the features of North East India - Traditional political Institutions

**CO2:** Learn about the relations between the North East India and the British and political status of the states and Hill Areas before Independence

**CO3:** Learn about Sixth schedule of the Indian constitution, formation of states – Nagaland, Meghalaya, Mizoram and Arunachal Pradesh

**CO4:** Learn about political parties – National and regional, their roles in the politics of North East India

**CO5:** Relationship between Centre and Region, North Eastern Council (NEC) and Political Movement

**Course Code: 609**

**Course Name: Gandhian Studies**

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On completion of the course, students will be able to

- CO1:** Understand the origin of Gandhian philosophy, his understanding of human nature and his views on the spiritualization of politics
- CO2:** Learn about Gandhi's concept of Satyagraha, non-violence, freedom and equality.
- CO3:** Know about Gandhi's views on state, democracy and socialism.
- CO4:** Understand the Gandhi's concept of trusteeship essentials of Gandhian economics and it views on science and technology.
- CO5:** Understand the Gandhi and World peace and relevance of Gandhi in modern times.

**Course Code: 610**

**Course Name: Indian Political Thought**

On completion of the course, students will be able to

- CO1:** Understand the historical background of ancient philosophical traditions of India, Manu and Kautilya
- CO2:** Understand the Indian political thought like - Raja Ram Mohan Roy, Swami Vivekananda and Aurobindo Ghosh
- CO3:** Understand the famous Indian political thought like - Bal Gangadhar Tilak, Gopal Krishna Gokhale and M.N. Roy.
- CO4:** Understand special Indian political thoughts like - Md. Iqbal, Jawaharlal Nehru and Subhash Chandra Bose.
- CO5:** Understand the Indian political thought like - Dr. B.R. Ambedkar and Jayprakash Narayan.

**NAME OF PROGRAMME: B.SC. PHYSICS**

**Programme Outcome (POs):**


After completion of three year degree B.Sc. programme in Physics, the following outcomes are expected:

- PO1:** To understand the theories and principles in Physics
- PO2:** To enrich students' knowledge in Physics
- PO3:** To get acquainted with the practical knowledge of Physics
- PO4:** To understand the various applications of Physics in day-to-day life.
- PO5:** To motivate the students' interest in the field of Physics
- PO6:** To help the students in developing a successful career in the new developing of material science.

**Programme Specific Outcomes (PSOs):**

- PSO1:** To enable the students acquire knowledge in the field of mechanics.
- PSO2:** To enable the students understand about the various laws and principles in thermal physics and optics.
- PSO3:** To provide in depth knowledge in electricity and electrodynamics which have a key role in the development of modern technology.
- PSO4:** To provide knowledge about atomic and nuclear physics.
- PSO5:** To provide basic knowledge of circuit analysis, semiconductor diodes, bipolar junction. Transistors field effect transistor and amplifiers.

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- PSO6: To provide knowledge of the various mathematical tools.  
 PSO7: To provide knowledge of quantum mechanics and material physics.  
 PSO8: To gain knowledge of Physics through theories and practical.



**Course Outcomes (COs)**

**SEMESTER – I**

**Course Code: PHY 101**

**Course Name: Mechanics**

After the completion of these courses, students should be able to

**CO1:** Know about the fundamentals of Dynamics - dynamics of a particle, centre of mass, conservation of momentum and work energy theorem, conservative and non-conservative forces, and the experiments of these concepts.

**CO2:** Understand about rotational dynamics: the translational, vibrational and rotational motion; linear and angular momentum; moment of inertia of different shapes and experiments of these concepts; Newton's law of gravitation, potential energy and field due to spherical and solid sphere, energy equation and energy diagram; and know about their practical in laboratories.

**CO3:** Learn about Gravitation and Central Force Motion - simple and compound pendulum; damped harmonic oscillator; understand resonance and its types, linearity and superposition principle, and understand the above concepts through experiments in laboratory.

**CO4:** Know about Oscillatory motion: postulates of special theory of relativity, length contraction and time dilation, Einstein's mass-energy relation, and relativistic Doppler effect and transformation of energy and momentum

**CO5:** Learn about Special theory of Relativity – length contraction and time dilation, Einstein's mass-energy relation, Doppler's effect and transformation of energy and momentum, etc.

**SEMESTER – II**

**Course Code: PHY 202**

**Course Name: Thermal Physics and Optics**

After the completion of these courses, students should be able to

**CO1:** Know the fundamentals of Thermodynamics - laws of thermodynamics, Carnot's heat engine and Carnot's theorem, Maxwell relation and applications, Clausius - Clapeyron's equation, Ehrenfest's equation, Joule-Thompson effect and its theory, and practical related to these concepts

**CO2:** Understand about Kinetic theory of gases and radiation - derivation of Maxwell's law of distribution of velocities, Brownian motion, equation of state for ideal and real gases, Blackbody radiation, law of Wien's displacement, Rayleigh-Jeans and Planck's radiation, and practical for these concepts through experiments in laboratory.

**CO3:** Comprehend about Interference and Diffraction - theory of Newton's rings, Michelson's and Fabry-Perot interferometer, theory plane diffraction grating, and learn through experiments in laboratory.

**CO4:** Know about Polarization and types, Babinet's compensator theory and uses, optical activity and polarimeter, and learn through experiments in laboratory.

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**CO5:** Understand about Elements of Quantum Optics - stimulated and spontaneous emission, Einstein's coefficients, and LASER and its mechanism with applications.



### **SEMESTER – III**

**Course Code: PHY 303**

**Course Name: Electricity and Magnetism**

After the completion of these courses, students should be able to

**CO1:** Learn about the vector and scalar fields, gradient, divergence and curl, and Gauss's, Stoke's and Green's theorem.

**CO2:** Understand about Electric field and electric lines, Gauss's Law and applications, Poisson's and Laplace's equation, Dielectric properties of matter, polarization, Gauss's law and Clausius-Mosseti equation, and learn through experiments in laboratory.

**CO3:** Learn about Magnetic field, force between currents, divergence and curl of B, Calculation of B for straight wire, circular loop and solenoid, different types of magnetic properties of matter, hysteresis and B-H curve, and learn these concepts through experiments in laboratory.

**CO4:** Learn about Electromagnetic induction - alternating current and transient phenomena, Applications of L-R, C-R and L-C-R circuits, Maxwell equations, equation of continuity, wave equation for E and B and Poynting theorem, learn these concepts through experiments in laboratory.

### **SEMESTER – IV**

**Course Code: PHY 404**

**Course Name: Atomic and Nuclear Physics**

After the completion of these courses, students should be able to

**CO1:** Learn about X-ray and its types, X-ray diffraction, Bragg's law, measurement of X-ray wavelength; atomic masses, Bainbridge and Aston mass spectrograph, and learn these concepts through experiments in laboratory.

**CO2:** Understand about Atomic spectra - hydrogen spectrum, Bohr's theory, Sommerfield's modification of Bohr's theory, Pauli's exclusion principle, L-S and j-j coupling schemes and Zeeman effect, and learn these concepts through experiments in laboratory.

**CO3:** Learn about Radioactivity: radio-active decay and half-life, theory of successive transformation, carbon dating, artificial radioactivity, radio-isotopes and their uses, theory of alpha, beta, gamma decay and neutrino hypothesis.

**CO4:** Learn about different types of particle accelerator, nuclear detectors, nuclei and their various properties, different types of nuclear models with applications and different types of nuclear reaction.

### **SEMESTER – V**

**Course Code: PHY 505**

**Course Name: Electronics**

After the completion of these courses, students should be able to

**CO1:** Know about basic circuit analysis - different models, Kirchoff's law, voltage and current divider rules, principle of superposition, Thevenin and Norton's theorems, and know these through experiments in laboratory.

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- CO2:** Understand about Semiconductor diodes - p-n junction diode, Zener diode with its application, and learn through experiments.
- CO3:** Learn about Bi-polar junction transistors (BJT) - n-p-n structures, common-emitter, common-base configuration, analysis of a transistor using  $\alpha$  and  $h$  parameters, derivation of current gain, input resistance, voltage gain and output resistance of CB, CE amplifier configuration, and learn these through laboratory experiments.
- CO4:** Comprehend about Field effect transistor (FET) - classification of various types of FETS, details of junction field effect transistor, understand MOSFET, and learn through laboratory experiments.
- CO5:** Know about Amplifier: resistance, capacitance and transformer couple amplifiers, differential amplifiers with principles of operational amplifiers along with applications, and their laboratory experiments.
- CO6:** Oscillators - wave-form generators, Barkhausen criterion, RC, Wien Bridge and phase shift oscillator, and experiments in laboratory.
- CO7:** Learn about Digital circuits - binary system, NOR, NAND gates, half and full adders, Derivation using Karnaugh map, Minimize Boolean expression using K-map, and experiments of these concepts.

**Course Code: PHY 506**

**Course Name: Mathematical Physics**

After the completion of these courses, students should be able to

- CO1:** Know about Complex variables and functions of a complex variable - continuity and derivative, Cauchy-Reimann condition, analytic functions, integration of a complex variable, Cauchy integral formula, Taylor and Laurent series, singularities with classification.
- CO2:** Know about Special functions - Gamma and Beta function with recurrence relation, Legendre, Hermite, Laguerre polynomials with generating functions, recurrence and orthogonality relations, and Bessel differential equation with generating, recurrence, orthogonality relation.
- CO3:** Learn about Partial differential equations - derivation of the equation with solution under various initial conditions, vibrations of stretched string, and vibration of rectangular and circular membranes, heat conduction, derivation of the equation for finite rod, semi-infinite rod, classical wave and Laplace equation.
- CO4:** Learn about Fourier series orthogonality of sine and cosine functions, Fourier series of a function, Fourier series expansion of a periodic function, and Parseval's theorem, sine and cosine series.

**Course Code: PHY 507 (P)**

**Course Name: Laboratory**

After the completion of this course, students are expected to know the concepts of electronics through practical such as drawing the characteristics of a transistor in the CE and CB configuration, resonance curve of series and parallel LCR circuit, construction of two input OR and AND logic gates etc.

**SEMESTER – VI**

**Course Code: PHY 508**

**Course Name: Quantum Mechanics**

After the completion of this course, students are expected to

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**CO1:** Know about the Origin of Quantum theory - Black body radiation, Planck's hypothesis, photoelectric and Compton effect, Bohr's postulate, Bohr's atomic model and Bohr-Sommerfeld quantization rule, wave particle duality, De Broglie wave, Davisson Germer, electron and neutron diffraction experiment, and Heisenberg's uncertainty principle.

**CO2:** Understand about the Basic postulates and formalism - Schrodinger's wave equation, and mathematical operators, eigenvalues and its physical meaning, expectation value and Ehrenfest's theorem, commutator algebra, etc.

**CO3:** Know about stationary states, time independent Schrodinger equation, wave functions, free particle and plane wave.

**CO4:** Learn about particle in a one-dimensional box, Know motion of a Understand energy Eigen values and functions, and calculation of expectation values, qualitative estimation of the ground state energy from the uncertainty principle.

**CO5:** Know about linear harmonic oscillator and virial theorem.

**CO6:** Understand about one-dimensional finite potential step, stationary solutions, reflection and transmission coefficients, phenomena of barrier penetration.

**CO7:** Understand solution for the energy spectrum and the Eigen functions, the quantum numbers  $n, l, m$ , degeneracy, expectation values and the virial theorem.

**Course Code: PHY 509**

**Course Name: Physics of Materials**

After the completion of this course, students are expected to

**CO1:** Know about Crystal structure - crystalline and amorphous solids, different crystal structures and X-ray diffraction, and different lattice types, Braggs law.

**CO2:** Learn about Electrical Properties of Materials - free electron model and its limitation, Bloch theorem, Kronig Penney model, effective mass, concept of hole, band gaps, different classification of solids, intrinsic and extrinsic semiconductors, p-type and n-type semiconductors, conductivity of semiconductors, concentration of charged carriers, Fermi level and its temperature dependence, classical Hall effect.

**CO3:** Understand about different types of magnetic materials, classical theory of diamagnetism and paramagnetism, Curies law, Wiess' theory of ferromagnetism, magnetic domains, soft and hard magnetic materials, lattice vibrations, monoatomic and diatomic lattice vibrations, acoustic and optic modes, Einstein's theory of specific heat, density of states and Debye's theory of specific heat.

**CO4:** Learn about lattice vibrations, monoatomic and diatomic lattice vibrations, acoustic and optic modes, Einstein's theory of specific heat, density of states and Debye's theory of specific heat.

**CO5:** Understand the experimental properties, Meissner effect, London's theory and penetration depth, isotope effect, type I and type II superconductors, elementary idea of high to superconductivity.

**CO6:** Know about density of states in low dimension, different types of nanomaterials, the concept of blue shifting, quantum wells, wires, various applications of nanoscience.

**Course Code: PHY 510 (P)**

**Course Name: Laboratory**

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After the completion of this course, students will be able to determine the wavelength of monochromatic light source by Fresner's biprism, draw different types of curves such as ( $\mu$ - $\lambda$ ), (D- $\lambda$ ), B-H curve and also to determine the wavelength etc.



## **NAME OF PROGRAMME: B.SC. ZOOLOGY**

### **Programme Outcome (POs):**

After successful completion of B.Sc. Zoology programme, it is expected to render the following outcomes:

#### **Knowledge outcomes:**

**PO1:** Improve the quality of life with application of the knowledge of the different branches of the subject starting from the knowledge of environment and species conservation, pollution control, prevention of diseases and correct choice of quality food sources.

**PO2:** Demonstrate and apply the fundamental knowledge of the basic principles of major fields of zoology and to solve related issues.

**PO3:** Obtain a graduate degree meant for job and higher studies.

#### **Skill outcomes:**

**PO4:** Foster curiosity in the students for Zoology.

**PO5:** Create awareness amongst students for the basic and applied areas of Zoology.

**PO6:** Orient students about the importance of abiotic and biotic factors of environment and their conservation.

**PO7:** Provide an insight to the aspects of animal diversity.

**PO8:** Inculcate good laboratory practices in students and to train them about proper handling of lab instruments.

#### **Generic outcomes:**

**PO10:** Demonstrate knowledge and understanding of Zoology and management principles and apply these to one's own and social level.

**PO11:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**PO12:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

### **Programme Specific Outcomes (PSOs):**

Once the course is completed, students are expected to

**PSO1:** Understand the nature and basic concepts of cell biology, genetics, taxonomy, physiology, ecology and applied Zoology.


**PSO2:** Analyze the relationships among animals with their ecosystems.


**PSO3:** Perform procedures as per laboratory standards in the areas of Taxonomy, Physiology, Ecology, Cell biology, Genetics, Applied Zoology, Clinical science, tools and techniques of Zoology, Toxicology, Sericulture, Biochemistry, Fish biology, Animal biotechnology, Immunology and research methodology.

**PSO4:** Understand the applications of Zoology in Agriculture, Medicine and daily life or economic Zoology such as sericulture, Apiculture, aquaculture, Industrial microbiology, DNA technology and medicine for their career opportunities.

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- PSO5:** Gains knowledge about research methodologies, effective communication and skills of problem-solving methods.
- PSO-6:** Work his role in nature as a protector, preserver and promoter of life which he has achieved by learning, observing and understanding life.
- PSO7:** Contribute the knowledge for Nation building.

### Course Outcomes (COs)

#### **SEMESTER – I**

**Course Code: ZOO 101**

**Course Name: Principles of classification, Zoogeography and Paleozoology**

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

**CO1:** Describe the classification of animals, concept of species, taxonomy systematics, taxonomical hierarchy, and approaches in taxonomy: morphometric and cytological techniques.

**CO2:** Discuss the international code of zoological nomenclature, concepts of chemotaxonomy and the basic concept of molecular techniques in taxonomy.

**CO3:** Explain the zoogeographical regions of the world with characteristic fauna and marine realms with characteristics; describe the barriers – types and significance; continental drifts and discontinuous distribution.

**CO4:** Have the knowledge of paleozoology- study of fossils, types; trace fossils, living fossils, dating and significance; and Illustrate geological time scale and associated fauna.

#### **SEMESTER – I**

**Course Code: ZOO 101P**

**Course Name: Practical on the Principles of Classification, Zoogeography and Paleozoology (Practical)**

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

**CO1:** Show knowledge and skills of field collection trip in taxonomic procedure, methods, preservation, identification, description, of species.

**CO2:** Demonstrate practical knowledge in zoological time scale.

#### **SEMESTER – II**

**Course Code: ZOO 202**

**Course Name: Practical on the Principles of Classification, Zoogeography and Paleozoology (Practical)**

After successfully completing this course, students will be able to,

**CO1:** Know about Protozoa, Metazoa and Porifera – their distinguishing characteristics and classification.

**CO2:** Understand about Coelenterata, Platyhelminthes and Nematelminthes - its structural organisation and affinities.

**CO3:** Understand non-chordate (invertebrate) groups of animals starting from microscopic and unicellular organisms to low level multi-cellular organisms--phylum protozoa, metazoa, porifera, coelenterata, helminthes, annellida, arthropoda, mollusca, Echinodermata, etc and their classifications.

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CO4: Gain the knowledge of minor phyla.

**Course Code: ZOO 202P**

**Course Name: Practical on Functional anatomy of the Non-chordata**



After successfully completing this course, students will be able to:

CO1: Show skill in dissection of organ systems of the invertebrates.

CO2: Identify the permanent slides and museum specimens of invertebrates.

CO3: Show the preparation of temporary slides with the invertebrates.

**SEMESTER – III**

**Course Code: ZOO 303**

**Course Name: Functional anatomy of Chordata**

After successfully completing this course, students will be able to:

CO1: Describe the general characters of Chordate (vertebrata)

CO2: Explain classification - proto-chordates, cyclostomes, fishes, amphibian, reptiles, birds and mammals with their characters.

CO3: Discuss about the functional anatomy of different organs—kidney, hearts eyes, limbs and girdles.

CO4: Show the comparison of organ systems –integument, digestive, circulatory, skeleton, nervous urino-genital systems and endocrine glands of chordates,

**Course Code: ZOO 303P**

**Course Name: Practical on Functional Anatomy of Chordate**

After successfully completing this course, students will be able to:

CO1: Demonstrate practical skills in dissection of organ systems of the vertebrates.

CO2: Identify the museum specimens of chordates.

CO3: Explain the different structures of bones –analytical comparison.

**SEMESTER – IV**

**Course Code: ZOO-404:**

**Course Name: Biodiversity, Environmental Biology, Applied Zoology and Computer Application**

After successfully completing this course, students will be able to,

CO1: Understand concepts of biodiversity and hot spots; wild life, and conservation in the context of Manipur and India as a whole.

CO2: Explain the concept of ecosystems, different types of ecosystems; biotic and abiotic factors, food chain and energy flow; biological cycles, and biosphere; environmental pollution-types, sources, causes and control and prevention; explain the toxic effect of pesticides and industrial wastes, and the idea of bio-magnifications.

CO3: Gain the concept of population and it working and related laws.

CO4: Have the idea of applied zoology in apiculture, sericulture and pisciculture.

CO5: Gain the knowledge of computer application in biology using software packages.

**Course Code: ZOO-404P**


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**Course Name: Practical on biodiversity, environmental biology, applied zoology and computer application**

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

**CO1:** Identify and explain the biotic and abiotic components of a pond ecosystem, recording of parameters of water quality, demonstrate the tagging experiment of population study.

**CO2:** Study of life history stages of honey bee, silk moth, fish, etc.

**CO3:** Visit and learn about wildlife sanctuaries, zoo/national park and study about the animals available therein.

**SEMESTER –V**

**Course Code: ZOO-505**

**Course Name: Cell Biology and Genetics**

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

**CO1:** Define basic terms in cell biology, knowledge of different types of cells, cellular organization, cell organelles, cell processes and nuclear organization

**CO2:** Explain the different types of cell divisions and their regulation

**CO3:** Describe the processes of protein synthesis, RNA replication, gene action; Lac Operon and Tryptophan Operon model,

**CO4:** Grasp the idea of overall view of genetics, sex determination, blood groups, mutation, genetic diseases, and counselling.

**CO5:** Gain knowledge of molecular genetics and tools-RELP, RAPD, PCR and human genome project; and help enlighten in improvement of human quality and research.

**Course Code ZOO-506:**

**Course Name: Evolution, Adaptation, Ethnology, Biotechnology and Bioinstrumentation**

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

**CO1:** Understand the theories of evolution, role of evidences in support of evolution, theories of organic evolution, origin of life and theories of origin of life.

**CO2:** Know the adaptation of animals with different modes of life and environments. Understand different types of animal behaviours

**CO3:** Describe animal behaviours, their communication types; learn about migration in insects, fishes and birds

**CO4:** Explain the types of biotechnology and its importance; food production using biotechnology, ideas of health- care biotechnology; have the knowledge of in-vitro fertilization in human and other assisted reproductive technologies; cell culture, genetic engineering and production of transgenic animals.

**CO:** Gain the knowledge of different important bio-instruments.

**Course Code ZOO-507P**

**Course Name: Practical on Cell Biology, Genetics, Evolution, Adaptation, Ethnology, Biotechnology and Bioinstrumentation**

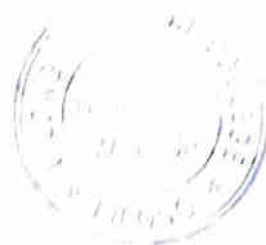
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After completion of the course, the students will be able to,



- CO1: Demonstrate the different stages of mitosis and meiosis using biological matters
- CO2: Demonstrate the sex chromosomes of a grasshopper and a mammal.
- CO3: Do the karyotyping of chromosomes.
- CO4: Demonstrate sex chromatin (barr body) and mitochondria.
- CO5: Gain the knowledge of mimicry in different animals.
- CO6: Explain the different type of nest and parental care.
- CO7: Demonstrate alcohol, soya bean fermentation and curd making using starter culture.
- CO8: Use different bio-instruments with application.
- CO9: Demonstrate the estimation of amino acids and protein using spectrophotometer.
- CO10: Measure cell size using micrometer.
- CO11: Demonstrate the separation of tissue extract using centrifuge, and the process of electrophoresis.

#### SEMESTER – VI

Course Code: ZOO-608:

Course Name: Animal Physiology, Endocrinology, Immunology

After completion of the course, the students should be able to,

- CO1: Discuss nutritional value of micro – macro nutrients including digestion and absorption.
- CO2: Explain blood circulation, heart, composition of blood, blood groups and RH factor.
- CO3: Gain knowledge of respiration, system, oxygen, carbon dioxide, hemoglobin-mechanism and control.
- CO4: Explain the physiology of urine formation, role of kidneys, regulation, salt and acid- base balance.
- CO5: Gain knowledge of muscle, nerve, and sense organs, their structural, chemical, and physiological basis.
- CO6: Define endocrine glands and neurosecretory cells and explain different hormones of the body and their functions.
- CO7: Gain the knowledge of immune system and immunology - innate immunity and acquired immunity and antigen – antibody reaction; and know about HIV and AIDS.

Course Code: ZOO-608:

Course Name: Developmental biology, histology, and biological chemistry

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

- CO1: Discuss formation of eggs, fertilization, parthenogenesis and fertilization processes.
- CO2: Describe the different types of eggs, blastulation, and gastrulation, development of extra embryonic membranes.
- CO3: Describe formation of organs, development of different organs.

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By, Pakeshwar Singh

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- CO4:** Explain the histological techniques, and study of tissues, e.g., kidney, lung, , liver, ovary, testes, skin etc.
- CO5:** Describe the chemistry of carbohydrates, proteins, lipids, nucleic acids.
- CO6:** Define and describe glucogenolysis, and gluconeogenesis.
- CO7:** Understand electron transport system and bioenergetics.

**Course Code: ZOO-610:**

**Course Name: Practical on Animal Physiology, Endocrinology, Immunology, Developmental Biology, Histology and Biochemistry**

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

- CO1:** Do counting of RBC and WBC, estimate haemoglobin percentage, demonstrate coagulation of blood, recording of heart beat, preparation of haemin crystals.
- CO2:** Demonstrate the effects of acetylcholine, atropine and epinephrine on heartbeat of frogs.
- CO3:** Do the determination of ABO and Rh blood groups.
- CO4:** Identify and show carbohydrates, protein and lipid presence.
- CO5:** Proceed calorimetric estimation of protein and amino acid contents.
- CO6:** Demonstrate the section cutting and stretching of ribbon from paraffin block.
- CO7:** Show dissection of endocrine gland in rats/frogs.

**ENDS HERE**

*Ng. Pkeshwor Singh*

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