

## **PROGRAMME OUTCOME U.G BOTANY**

PO1:-Understand Students knowledge of plant Classification method .

PO2:- Students will be able to understand tell plant botanical nomenclature technique.

PO3:- Students will develop intrested to various pathogen plant disease symptoms to field study.

PO4:- Students Experiment Knowledge of practical concepts of Frequency , Density, Abundance Of Grassland.

PO5:- Students gain practical knowledge Of gram staining Bacteria with curd.

PO6:-Student understand the special various fungal disease plant symptoms Knowledge.

PO7:- Understanding the botany Knowledge Applying the own life and work .

PO4:- student will be able to understand plant physiology various types practical knowledge Determination of Experiment.

## **PROGRAMME SPECIFIC OUTCOME U.G BOTANY**

PSO1:- Understanding the Nature and Basic concepts of all the plant groups thier metabolism Components at the Molecular level,Biochemistry, taxonomy , ecology.

PSO2:- Hands on expertise in Biological sciences.

POS3:- Understand Botany knowledge it is essential for many career opportunities and job Opportunities

## **COURSE OUTCOME U.G BOTANY**

**( Virus, Bacteria, Biotechnology, fungi, Algae, Lichen, Mycoplasma, Blue green algae, Mashroom, Bryophyta, pteridophya , Gymnosperm, Paleobotany)**

CO1:- On completion of the course students will be able to- Understand the diversity among Virus thier multiplication as nd life cycle and economic Importance of virus.

CO2:- Students Understand the Bacteria Diversity and economic importance.

CO3:- The students will be able to understand Fungus classification and various type fungus Disease and fungus symptoms.

CO4:- The students will be able to after this course is completed Recombinant DNA Technology tools steps Significance and use of Recombinant DNA Technology.

CO5:- Understand the students various type of algae and knowledge of Students Home present algae structure.

CO6:- Understand the Lichen and Mashroom economic importance.

CO7:- The students understand riccia and marchantia bryophyte life cycle.

CO8:- The students understand pteridophytic member and knowledge some member used Vegetable in daily life.

CO9:- Understand the students pinus cycas and ephreda life cycle and Fossil Gymnosperm ,Fossil pteridophytic plant.

## **(PLANT TAXONOMY, ECONOMIC BOTANY, PLANT ANATOMY AND EMBRYOLOGY)**

### **(ECOLOGY AND PLANT PHYSIOLOGY)**

CO1:- Students Understand the Bentham & hooker classification, binomial nomenclature, IUCN, Preservation of plant material and Herbarium technique. importance botanical garden.

CO2 :- On completion of the course students will be able to :- Understand various angiosperms Families emphasizing thier morphology distinctive features of biolo and know their Economic importance.

CO3 :- On completion of the course students will be able to Understand the role planls in human welfare. gain plant about various plant of economic Know importance of plants & plant product & know the utility of plant resources.

CO4:- On completion of the course students will be able to:-

:- Understand the scope & importance of anatomy . know various type of tissue system and normal and anamalous secondary growth in plants.

:- understand structure and development of plant reproductive organs & megasporogenesis & microsporogenesis. know the process of fertilization and embryology.

CO5:- On completion of the course, students will be able to:-

:- Understand scope of ecology, ecological adaptation in plants and plant communities.

:- Know concepts of ecosystem and biogeochemical cycle.

CO6:- On completion of the course , students will be able to :-

:- Understand the role plants cell in relation of water.

:- Understand the process of photosynthesis & respiration in higher plants.

- Understand the learn about the moveo of sap and adsorption, translocation water and Food.

- Understand the plants hormones,& plants movement.

**(ANALYTICAL TECHNOLOGY,PLANT PATHOLOGY,EXPERIMENTAL EMBRYOLOGY,ELEMENTARY BIOSTATISTICS, ENVIRONMENTAL POLLUTION ANDONSERVATION)**

CO1:- Students will be able to understand after this course is completed

Chromatography,oven,incubater,autoclve,centrifuge,spectrophotometer technique.

CO2:- Understand the students cell wall ,plasma membrane, cytoplasm,ER, mitochondria, Nucleus structure.and giant chromosome cell division,linkage, chromosomal aberration, Mendals laws,gene interaction,gene concepts.

CO3:- Understand the students DNA-RNA structure, replication.and Mutation, genetic code. and understand the mechanism of transcription & translocation in prokaryotes,gene Regulation & expression by operon models.

CO4:-Understand the students tools of recombinant DNA Technology & gene cloning ,PCR Application of biotechnology,G.M plants,DNA fingerprinting.

CO5:-Understand the students protein, carbohydrates,fats, general acount& enzyme Nomenclature and & classification of various enzyme and thier activities.

CO6:- Students Understand the various type of plant tissue culture& microscope.

CO7:- understand the students general symptoms infection fungal,bacterial, virus various type of Plant Disease.

CO8:-Understand the Students pollution ,green house gases,BOD,COD,& plant indicater Concepts of biodiversity, national park & diversity hot spot, conservation strategies and ICUN threat categories.

CO9:-Understand the students Elementary Biostatistics.

Course: course nuclear chemistry is a part of our course curriculum and has been introduced with an objective to present a vignette of the nuclear structure, its stability and induce the students to take up nuclear research in their higher studies.

There are lots of scope opportunity, research and development in this subject, since a lot still remains unexplored in this arena

## **B.sc. part 1**

### **Paper - 1 ( inorganic chemistry)**

Unit 1- To study atomic structure and periodic property to explain the chemical behavior ...

Unit 2- To discuss chemical bonding, valence bond theory and shape of some inorganic molecules...

Unit 3- To study chemical bonding and ionic structure...

Unit 4- comparative study and features of s block & p block elements...

Unit 5- To study chemical properties of noble gases and inorganic chemical analysis....

### **Paper - 2 nd { organic chemistry }**

Unit 1 - To study electronic structure and binding of organic reactions.

Unit 2 - To discuss stereochemistry of organic compounds.

Unit 3 - To study aliphatic and aromatic ring components of cyclonkanes.

Unit 4 - Discuss the mechanism of alkanes, dienes, and alkynes.

Unit 5 - To study aromatic hydrocarbons, Huckel rule and substitution reactions.

### **Paper - 3rd { Physical chemistry }**

Unit 1 - To study the Mathematical Concept, Permutation & Combination & Probability

Unit 2 - Discuss the gaseous state and molecular velocities of gaseous molecules

Unit 3 - To study the liquid state, properties and colloquials and surface chemistry

Unit 4 - Discuss solid state chemistry and X - ray diffraction.

Unit 5 - study the chemical kinetics Arrhenius theory & catalysis

Learning Outcomes: After completing the course the student will be expected to be able to:

\* Understand chemical bonding in compound and ionic structure.

- \* Understand the concept of saturation, unsaturation and aromaticity.
- \* Solve mathematical calculation applied in chemistry.
- \* Apply integrated rate equations to solve for the concentration of chemical species during reaction of different order, recall, manipulate and properly employ Arrhenius law, plot equations and functions representing kinetic behaviour of chemical systems, explain potential energy surface.
- \* Solve the problems in solid, liquid and colloidal state.

## **B.sc part 2**

### **Paper 1st { Inorganic chemistry }**

Unit 1 - Discuss the chemistry of elements of transition series.

Unit 2 - Study the oxidation & reduction and coordination compounds

Unit 3 - To study coordination chemistry.

Unit 4 - Study of chemistry of lanthanide elements.

Unit 5 - Study the acid and bases.

### **Paper - 2 nd { Organic chemistry }**

Unit 1 - To study chemistry of organic halides.

Unit 2 - To study alcohols, phenols & ether.

Unit 3 - To study of aldehyde & Ketone.

Unit 4 - To discuss the carboxylic acid and its derivatives.

Unit 5 - To discuss the organic compounds of nitrogen

### **Paper - 3rd { Physical chemistry }**

Unit 1 - to study fundamentals of thermodynamics system and surroundings and thermochemistry.

Unit 2 - To study change in entropy of different processes through thermodynamics.

Unit 3 - To discuss chemical and ionic equilibrium.

Unit 4 - To study phase rule, phase component & nernst distribution law

Unit 5 - To study about the theories and principles of photochemical reactions  
{ photochemistry }

Learning Outcomes: After completing the course the student will be expected to be to:

- \* Student should learn the synthesis, structures, bonding and reactivity of lanthanides and actinides element. Industrial application as well as medicinal importance of these components will also be discussed.

\* Be also to identify and rationalize type of redox reaction with suitable mechanism. Able to do some quantitative analysis.

\* Able to discuss the concept of entropy in different thermodynamics system and chemical & ionic equilibrium in solution and gas phase.

### **B.sc part 3**

#### **Paper 1st { Inorganic chemistry }**

Unit 1 - To study metal - ligend bonding in translation metal complexes and thermodynamics & kinetics aspects of transition metal complexes.

Unit - 2 To discuss magnetic properties and electronic spectra of transition metal complexes

Unit - 3. To study nomenclature, classification, preparation and bonding in organometallic compounds.

Unit - 4 To study bioinorganic chemistry essential and trace in biological processes.

Unit - 5 To study hard and soft acids and bases concept in chemistry.

#### **Paper 2nd { organic chemistry }**

Unit - 1 To study organometallic & organolithium, organo sulphur compounds. Discussion on organic synthesis via enolates formation.

Unit - 2 To study biomolecules classification and there constitutions.

Unit - 3 To study synthetic polymers and systhesis dyes.

Unit - 4 To discuss principles and applications of mass UV- visible and IR spectroscopy.

Unit - 5 To study NMR and <sup>13</sup>CMR spectroscopy and applications in MRI { introductions }.

#### **Paper 3rd { physical chemistry }**

Unit - 1 To study Quantum mechanics.

Unit - 2 To discuss Quantum mechanics approach of molecular orbit theory.

Unit - 3 To study electromagnetic radiation, vibration and Raman spectra.

Unit - 4 To study electronic spectra of diatomic molecules and photochemistry.

Unit - 5 To study principles and applications of thermodynamics. Physical properties and molecular structure and magnetic properties of solid.

Learning Outcomes: After completing the course the student will be expected to be able to:

\* Apply NMR, IR, MS, UV, -Vis spectroscopic techniques in solving structure of organic molecules and in determination of their stereochemistry, explain the spectral transitions.

\* Determine bond length from rotational spectral data, identify functional group in vibration spectra interpret the above spectroscopic data of unknown compounds and determine the nature of proton and determine number of equivalent proton in a molecule from proton NMR spectra.

\* Explain the use the central concepts, theoretical description, and fundamental approximation applied to atoms.

\* Treat the quantum mechanical formalism for identical particles and apply these to the structure of atoms, explain fundamentals of photochemistry and the laws governing it, explain Jablonski diagram and describe and non - radiation transition.

## **PROGRAMME OUTCOME U.G ZOOLOGY**

PO1: Student gain knowledge comparative anatomy of various organ system of vertebrate.

PO2: Students will understand the detail of the animal kingdom and the action in it.

PO3: Students will be able to tell the developmental process in organism.

PO4: Students will know about the environment in their lives and conserve the individuals by Making them aware.

PO5: Student gain practical knowledge in R.Bc,W.Bc counting & blood group test in human being.

PO6: Student improve scientific knowledge in zoology with special evidence.

PO7: Understand about various concept of cell, cell division ,cell organelles and non chordata.

PO8: Student gain practical knowledge (Dissection) in making clay modeling.

PO9: Students will develop interest and kindness towards organism.

PO10: Applying the understanding zoology knowledge his own life and work.

## **COURSE OUTCOME UG ZOOLOGY**

### **(Cell Biology and Non-chordata)**

CO1: The students will be able to understand after this course is completed The cell (Prokaryotic and Eukaryotic), Organization of Cell: Extra-nuclear and nuclear ,Plasma membrane, Mitochondria, Endoplasmic reticulum, Golgi body, Ribosome.

CO2: The students will be able to understand after this course is completed Cell division (Mitosis and Meiosis), An elementary idea of Cancer cells And Cell transformation, Immunity: Innate & Acquired Immunity, Lymphoid organs.

CO3: The students will be able to understand after this course is completed General characters and classification of Phylum Protozoa, Porifera, and Coelenterata up to order & type study - Paramecium, Sycon, Obelia.

CO4: The students will be able to understand after this course is completed General characters and classification of Phylum Platyhelminthes, Nematelminthes, Annelida and Arthropoda up to order & type study - Fasciola, Ascaris, Pheretima, Palaemone.

CO5: The students will be able to understand after this course is completed General characters and classification of Phylum Mollusca and Echinodermata up to order & type study- Pila, Asterias (Starfish).

## **(CHORDATA AND EMBRYOLOGY)**

CO1: The students will be able to understand after this course is completed Classification of hemichordata, Hemichordata :type study -Balanoglossus Classification upto orders, Protochordata :type study-Amphioxus, A comparative of petromyzon and myxine.

CO2: The students will be able to understand after this course is completed Fishes-skin and scale, migration in fishes, parental care in fish, Amphibia-Parental care and neoteny Reptilia-Poisonous and non poisonous snakes, poison apparatus, snake venom and extinct reptiles.

CO3:The students will be able to understand after this course is completed Birds-Flight adaptation, migration and perching mechanism, discuss -Birds are glorified reptiles , Mammals-Comparative account of prototheria, metatheria, eutheria and affinities aquatic mammals and their adaptation

CO4: The students will be able to understand after this course is completed Fertilization, gametogenesis, structure of gamete and types of eggs cleavage, development of frog up to formation of three germ layers parthenogenesis.

CO5: The students will be able to understand after this course is completed Embryonic

induction, differentiation and regeneration, development of chick(A) up to formation of three germ layers, (B) Extra -Embryonic membranes placenta in mammals.

## **(ANATOMY AND PHYSIOLOGY)**

CO1: The students will be able to understand after this course is completed Integument and its derivatives, function of skin epidermal derivatives( soft and hard) structure of scales, hair and feature, alimentary canal and digestive gland in vertebrates , respiratory organs (gill and lung), Air sac in bird.

CO2: The students will be able to understand after this course is completed Endoskeleton A. Axial skeleton (Skull and vertebrae) B. Appendicular skeleton -Limbs and girdles, Circulatory system -Evolution of heart and aortic arches, Urinogenital system-Kidney and excretory ducts

CO3: The students will be able to understand after this course is completed Nervous system - General plan of brain and spinal cord, Ear and Eye -Structure and function , Gonads and genital ducts.



CO4: The students will be able to understand after this course is completed Digestive and absorption of dietary components, Physiology of heart cardiac cycle and ECG, Blood regulation Respiration -Mechanism and control of breathing

CO5: The students will be able to understand after this course is completed Excretion - Physiology of Excretion, osmoregulation, Physiology of muscle contraction (Sliding theory of muscles contraction, molecular theory of muscle contraction ), Physiology of nerve impulse, Synaptic transmission.

## **(VERTEBRATES ENDOCRINOLOGY, REPRODUCTIVE, BIOLOGY ,BEHAVIOUR, EVOLUTION AND APPLIED ZOOLOGY)**

CO1: The students will be able to understand after this course is completed Structure and function of endocrine glands, Hormone receptor, Biosynthesis and secretion of thyroid, adrenal, Ovarian and testicular hormones, Endocrine disorder of pituitary, thyroid, adrenal and pancreas

CO2: The students will be able to understand after this course is completed Reproductive cycle in vertebrate, Menstruation, lactation and pregnancy Mechanism of parturition, hormonal regulation of gametogenesis

CO3: The students will be able to understand after this course is completed Evidences of organic evolution, Theories of organic evolution(Lamarckism and darwinism), Variation, mutation, isolation and natural selection, Evolution of horse

CO4: The students will be able to understand after this course is completed Introduction of ethology:Branches and concept of ethology, Patterns of behaviour taxis, reflexes drives and stereotyped behaviour, Reproductive, hormones and behaviour

CO5: The students will be able to understand after this course is completed Prawn culture, Sericulture, Apiculture, Pisciculture (Fish culture) poultry keeping, Element of pest control - 1Chemical control , 2 Biological control.

## **ECOLOGY,ENVIRONMENTAL BIOLOGY, TOXICOLOGY, MICROBIOLOGY & MEDICAL ZOOLOGY**

CO1: The students will be able to understand after this course is completed Aims and scopes of ecology,Major ecosystems of the world-Brief introduction,Population- Characteristics and regulation of densities,Communities and ecosystem,Bio-geo chemical cycles,Air & water pollution And Ecological succession.

CO2: The students will be able to understand after this course is completed the Laws of limiting factor, Food chain in fresh water ecosystem, Energy flow in ecosystem- Trophic levels, Conservation of natural resources, Environmental impact assessment, Conservation of natural resource and the Environmental impact assessment.

CO3: The students will be able to understand after this course is completed Definition and classification of Toxicants, Basic Concept of toxicology, Principal of systematic toxicology, Heavy metal Toxicity (Arsenic, Mercury, Lead, Cadmium), Animal poisons- snake venom,

scorpion & bee poisoning. Food poisoning.

CO4: The students will be able to understand after this course is completed General and applied microbiology , Microbiology of domestic water and sewage, Microbiology of milk & Industrial microbiology fermentation process and production of penicillin.

CO5: The students will be able to understand after this course is completed introduction to pathogenic microorganisms, Rickettsia, Spirochaetes, AIDS and Typhoid and some parasite of human being.

## **GENETICS, CELL PHYSIOLOGY, BIOCHEMISTRY, BIOTECHNOLOGY AND BIOTECHNIQUES**

CO1: The students will be able to understand after this course is completed Mutation Gene and chromosomal mutation Human genetics chromosomal alteration: Down, Edward, Patau, Turner and Klinefelter, Syndrome Single gene disorders: Alkaptonuria, Phenylketonuria, Sickle cell anemia, albinism and colour.

CO2: The students will be able to understand after this course is completed General idea about pH & buffer, Transport across membrane: Diffusion and Osmosis , Active transport in mitochondria & endoplasmic reticulum, Enzymes-classification and Action.

CO3: The students will be able to understand after this course is completed Amino acids & peptides- Basic structure & biological function Carbohydrates & its metabolism- Glycogenesis; Gluconeogenesis; Glycolysis, Glycogenolysis; Cose-cycle.

CO4: The students will be able to understand after this course is completed Application of Biotechnology, Recombinant DNA & Gene cloning, Cloned genes & other tools of biotechnology (Tissue culture, Hybridoma, Transgenic Animals and Gene library)

CO5: The students will be able to understand after this course is completed the Principles & techniques about the following:(i) pH meter (ii) Colorimeter (iii) Microscopy- Light microscopes: Compound, Phase contrast & Electron microscopes (iv) Centrifuge (v) Separation of biomolecules by chromatography.

### **PROGRAMME OUTCOME P.G ZOOLOGY SEMESTER**

PO1: Student will gain knowledge about invertebrates' structure and function

PO2: Students will know about the various behaviour of animals.

PO3: Student will gain knowledge of mean ,mode, median, chi- square test etc. and use in their academics.

PO4: Students will know about the role of environment in their lives and encourage them to conserve the environment.

PO5: Understand about various concept of general and comparative endocrinology systems in Organism.

PO6: Student gain deeply knowledge in gamete biology and reproductive physiology in human being.

PO7: Understand about various concept of cell, cell cycle, cell organelles and cancer cell.

PO8: Student gain knowledge about tools and techniques (microscope, centrifuge, pH meter, colorimeter, Spectrophotometer) and uses in laboratory.

PO9: Student gain knowledge of comparative anatomy of various organ system of vertebrates.

PO10: Student will understand deeply study of immune system in humans.

PO11: Student gain knowledge of genes and evolutionary process in organism with suitable example and evidence.

PO12: Student gain knowledge of different kind of fishes and their structures.

PO12: Students will develop interest and kindness towards organism.

PO13: Applying the understandings of zoological knowledge in their own life.

## **COURSE OUTCOME P.G ZOOLOGY SEMESTER**

### **INVERTEBRATES STRUCTURE AND FUNCTION MINOR PHyla**

CO1: The students will be able to understand after this course is completed the origin of life Unicellular and multicellular organism, body cavity coelom, acoelom, coelom, pseudocoelom, ultra structure of cilia and flagella.

CO2: The students will be able to understand after this course is completed respiratory organ gill, trachea and lung, physiology of respiratory pigment in invertebrates, filter feeding in - mollusca, polychaete, echinodermata., respiratory pigment in invertebrate.

CO3: The students will be able to understand after this course is completed higher invertebrates (nephridia, coxal gland, green gland), mechanism of excretion. Primitive and advanced nervous system, torsion in Gastropoda.

CO4: The students will be able to understand after this course is completed invertebrate larval forms - trematode, Cestoda, crustaceans, mollusca, echinodermata and minor phyla organization and character of - ctenophora, rotifera, branchiopoda, acanthocephala.

### **ANIMAL BEHAVIOUR**

CO1: The students will be able to understand after this course is completed Introduction to ethology, history of ethology, ethology as branch and its significance, method of studying behaviour, Antipredator defences, aggression and innate behaviour.

CO2: The students will be able to understand after this course is completed perception of environment-mechanical, electrical, olfactory, auditory, Communication -Visual, chemical, light, audio, evolution of songs.

CO3: The students will be able to understand after this course is completed social behaviour, aggregation-schooling in fishes, harding in animal, flocking in birds, group selection-Kin selection, altruism, Reproductive behaviour-mating system ,courtship, sexual selection.

CO4: The students will be able to understand after this course is completed Biological rhythms-circadian, and circannual rhythms migration of fishes and birds, larning and memory-conditioning, habituation, insight larning and reasoning.

### **QUANTITATIVE BIOLOGY**

CO1: The students will be able to understand after this course is completed Matrices and vectors , exponential functions, collection and presentation of data, tabulation, diagrammatic and graphical presentation.

CO2: The students will be able to understand after this course is completed General ideal about normal, binominal and poisson diatribution, measures of central tendencies-Mean, median, mode, standard error, mean and standard deviation, Variance, hypothesis testing -t test, chisquare test, f test.

CO3: The students will be able to understand after this course is completed probability theory, distribution and their properties, correlation, regression, Analysis of variance.

CO4: The students will be able to understand after this course is completed Types of models - statistical, empirical and mechanistic, simulation, properties of models-generality, precision and realiam, detailed treatment of model of cycling of nutrients in an ecosystem.

### **ECOLOGY AND ENVIRONMENTAL PHYSIOLOGY**

CO1: The students will be able to understand after this course is completed Abiotic and biotic factors, edaphic factor, limiting factors, climatic factors, biogeochemical cycle,community structure, adaptation-Type of adaptation, level of adaptation ,significane of body size, , physiological adaptation to different environment.

CO2: The students will be able to understand after this course is completed exponential growth and logistic growth modal, life table, Net reproductive rate, Reproductive value, population regulation-Extrinsic and intrinsic machanism.

CO3: The students will be able to understand after this course is completed Definition and type of polllution, biotic indicator of pollution , environmental and impact assessment, toxic chemicals, toxicity, green house gases, , ozone Depletion and environmental awareness.

CO4: The students will be able to understand after this course is completed Basic concepts of stress and strain, adaptation, concept of homeostasis, physiological response to oxygen deficient stress, meditation, yoga and their effect,physiological response to body exercise.

### **GENERAL AND COMPARATIVE ENDOCRINOLOGY OF VERTEBRATE**

CO1: The students will be able to understand after this course is completed Discovery of hormones , Classification of endocrine gland and hormones, experimental method of hormones research, pituitry gland, thyroid gland, adrenal gland, gastrointestinal tract.

CO2: The students will be able to understand after this course is completed biosynthesis of hormones, biosynthesis of simple peptide hormones, biosynthesis of amino acid derived small size hormones, biosynthesis of steroid hormones, release of hormone from endocrine gland.

CO3: The students will be able to understand after this course is completed neuroendocrine system-type of neuro hormones, synthesis and function of endorphin, enkephaline, and hypothalamic hormones, pituitary hormone, adrenal hormone, thyroid and parathyroid hormones, gastrointestinal hormone.

CO4: The students will be able to understand after this course is completed hormonal regulation and its metabolic activity -Protein metabolism, calcium metabolic, fat metabolism, role of hormone in fasting, hormone and behaviour, role of hormone in growth and development.

## **MOLECULAR CELL BIOLOGY**

CO1: The students will be able to understand after this course is completed structure, molecular composition, and function of plasma membrane, specialization of plasma membrane, transport across cell membrane, diffusion, active transport and pump uniport, symport, antiport.

CO2: The students will be able to understand after this course is completed Microfilament and microtubules-structure and dynamic, role of microtubule in mitosis, cell movement, signal transduction mechanism, cilia and flagella.

CO3: The students will be able to understand after this course is completed cell cycle, cell-cell signalling general idea, cell-cell adhesion and communication, cell matrix and adhesion, integrins and collagens, cell organelles-structure and function of mitochondria, ribosomes, ribosomes, golgi bodies, endoplasmic reticulum.

CO4: The students will be able to understand after this course is completed Morphological and functional elements of eukaryotic chromosome, morphology of giant chromosome, DNA structure replication and genetic codes, RNA structure, transcription and transposon, protein synthesis on free and bound.

## **GAMETE BIOLOGY AND REPRODUCTIVE PHYSIOLOGY IN HUMAN BEINGS**

CO1: The students will be able to understand after this course is completed chromosomal basis in sex differentiation, gonadal sex, brain sex differentiation, adrenarche, pubarche and puberty, formation of ova, menstruation cycle.

CO2: The students will be able to understand after this course is completed anatomy physiology and morphology of male reproductive system, spermatogenesis and development of spermatozoa, biochemistry of semen, chemistry and biosynthesis of androgen, secretion transport and metabolism of testes hormone and secondary sex character.

CO3: The students will be able to understand after this course is completed female reproductive system (ovary, fallopian tube, uterus, oogenesis), ovarian hormone - chemistry, biosynthesis, secretion, transport, function action and metabolism of estrogen progesterone and relaxing.

CO4: The students will be able to understand after this course is completed pre and post fertilization event, biochemistry of fertilization, role of hormone in parturition and lactation, formation and development of placenta and its endocrine function, hormonal and immune contraception.

### **TOOLS AND TECHNIQUES FOR BIOLOGY**

CO1: The students will be able to understand after this course is completed pH meter, colorimeter, Spectrophotometer, ultra centrifuge, principle of light transmission, electron (SEM,TEM), phase contrast and fluorescence.

CO2: The students will be able to understand after this course is completed media preparation and sterilization, inoculation and growth monitoring, design and function of tissue culture in laboratory, cell harvesting method.

CO3: The students will be able to understand after this course is completed cryopreservation for cell tissue and organism, cryotechniques for light and electron microscopy, immunological technique for antigen antibody interaction agglutination and precipitation reaction, biosensor.

CO4: The students will be able to understand after this course is completed separation technique in biology - chromatography, electrophoresis ( paper and gel), centrifugation.

### **COMPARATIVE ANATOMY OF VERTEBRATE**

CO1: The students will be able to understand after this course is completed the origin of chordates - amphibia, reptiles, aves, mammal, classification of vertebrates up to order with example.

CO2: The students will be able to understand after this course is completed evolution of heart, evolution of aortic arches, vertebrate integument and its derivatives, structure and function skin and derivatives - gland, scale, horn, nail, hoof, feathers and hair.

CO3: The students will be able to understand after this course is completed comparative account of digestive organ, respiratory organ and skeleton system.

CO4: The students will be able to understand after this course is completed comparative account of vertebrate - urinogenital system, brain and spinal cord. , Sensory receptor.

### **BIOSYSTEMATICS AND TAXONOMY**

CO1: The students will be able to understand after this course is completed historical resume of systematics, important and application of biosystematics in biology, chemotaxonomy, cytotoxicology, molecular taxonomy.

CO2: The students will be able to understand after this course is completed mechanism of speciation in panmictic and apomictic species, species concepts and species category, theories of biological Classification, taxonomic characters and different kinds.

CO3: The students will be able to understand after this course is completed taxonomic procedures, taxonomic key -different kinds of taxonomic keys, their merits and

demerits ,process of typification and different zoological types, international code of zoological nomenclature.

CO4: The students will be able to understand after this course is completed Types of biodiversity, hot spots of biodiversity, threat to biodiversity, conservation of biodiversity, shanon -Weiner index.

### **IMMUNOLOGY AND DEVELOPMENTAL BIOLOGY**

CO1: The students will be able to understand after this course is completed innate and acquired immunity, nature of immune response, antigenicity and immunogenicity, factor influencing immunogenicity, antigenic determinant epitope and paratope and cell and organ of immune system.

CO2: The students will be able to understand after this course is completed structure and function of antibody , immunoglobulin class and sub class, B cell activation, maturation, differentiation, T cell activation, maturation and differentiation.

CO3: The students will be able to understand after this course is completed complement system and it's regulation, major and minor histocompatibility complex (structure, peptide interaction, susceptibility diseases) and hypersensitivity.

CO4: The students will be able to understand after this course is completed cleavage and it's significance, tribulation and extension of the major organ forming area, development of primitive body form , histogenesis and the morphogenesis of the organ system( cardiovascular system and nervous system).

### **POPULATION GENETICS AND EVOLUTION**

CO1: The students will be able to understand after this course is completed hardy Weinberg law of genetic equilibrium, natural selection, mutation, genetic drift, migration, meiotic drive.

CO2: The students will be able to understand after this course is completed model of speciation(allopatric, sympatric, parapatric) , pattern and mechanism of reproductive isolation, inbreeding depression and heterosis.

CO3: The students will be able to understand after this course is completed how to construct phylogenetic tree, amino acid sequence and phylogeny, gene evolution, origin of higher categories, macro and micro evolution.

CO4: The students will be able to understand after this course is completed the genetic structure of natural population, phenotypic variation, pattern of change in nucleotide and amino acid sequence, neutral theory and metapopulation.

### **NEURO PHYSIOLOGY AND GENERAL PHYSIOLOGY**

CO1: The students will be able to understand after this course is completed central nervous system, gross anatomy of spinal cord, nerve endings (bio analyzers), the meninges, neurotrophin, cerebrospinal fluid and it's function.

CO2: The students will be able to understand after this course is completed synapse- structure, properties, reputable mechanism, the cranial and spinal nerve, neurotransmitters- structure function and metabolism.

CO3: The students will be able to understand after this course is completed physiology of digestion of carbohydrates, fat, protein and nucleic acid, structure of heart and function, synthesis and composition of blood, blood group system and blood coagulation.

CO4: The students will be able to understand after this course is completed properties of skeletal smooth and cardiac muscles, theory and physiology of muscle contraction, physiology of liver for excretion, structure of kidney and its excretory physiology and formation of urine.

#### **BIOCHEMISTRY AND METABOLIC REGULATION AND CELL FUNCTION**

CO1: The students will be able to understand after this course is completed chemistry of water function and regulation of water balance, formation of monosaccharide (glucose) - linear form, ring form, howarth perspective form, metabolism of carbohydrates.

CO2: The students will be able to understand after this course is completed protein configuration- primary, secondary, tertiary, quaternary structure., Biosynthesis of amino acid structure and properties, macro and micro minerals.

CO3: The students will be able to understand after this course is completed chemistry of DNA and RNA, metabolism of nucleic acid, eicosonoids and vitamin( fat and Water soluble).

CO4: The students will be able to understand after this course is completed enzyme - nomenclature, classification, coenzyme and isoenzyme or isozymes and lysozyme, oxidative phosphorylation, utilization of krebs cycle.

#### **FISH (ICHTHOLOGY) STRUCTURE AND FUNCTION**

CO1: The students will be able to understand after this course is completed Origin and evolution of fishes, Classification of fishes as proposed by berg, fish Integument, locomotion, alimentary canal and digestion.

CO2: The students will be able to understand after this course is completed accessory respiratory organs, air bladder and its function, excretion and osmoregulation, acoustic lateral line system.

CO3: The students will be able to understand after this course is completed luminous organs, colouration in fishes, sound producing organ, deep sea adaptation, hill stream adaptations.

CO4: The students will be able to understand after this course is completed migration in fishes, sexual cycle and fecundity, early development and hatching, poisonous fishes, parental care in fishes.

#### **APPLIED FISHERIES**

CO1: The students will be able to understand after this course is completed Introduction, colouration in fishes common diseases of fishes and their care, economic value of fishes, fishes as human food, fish of cattle, fishmanure, fish glue and insinglass fish.



CO2: The students will be able to understand after this course is completed, fresh water fishes of chhattisgarh and their culture, maintenance of nursery rearing stocking ponds, marine fisheries -Deep sea, coastal and off shore fisheries riverine and cold water fisheries.

CO3: The students will be able to understand after this course is completed Distribution of reservoir fisheries, lake type, principle lake fisheries, esturine fisheries, fish farming, principal cultivable fishes.

CO4: The students will be able to understand after this course is completed larvivorous fishes, exotic and transplanted fishes, planktons it's role in pollution of water and fisheries, preparation and maintenance of aquarium.

### **PROGRAMME OUTCOME U. G PHYSICS**

Student having B. Sc. Program in various branches. After the completion of the B. Sc. degree there are options available for the science students, they can pursue Master degree in science. M.Sc. and work in research related fields and can Even look for professional job oriented course. The student is also eligible for the job of various government exams conducted by Upsc. Psc. Ssc. and Banking field.

### **Program specific outcome of U. G. Physics**

PSO1: Graduates will acquire a comprehensive knowledge and sound understanding of fundamentals of physics.

PSO2: Graduates will be prepared to acquire a range of general skills to solve problem to evaluate information to use computers productively to communicate with society and effectively learn Independently.

PSO3: Graduates Will acquire a job efficiently in diverse field such as science and Engineering, Education, Banking public services, Business etc.

PSO4: The graduates will have continuous learning attitude to adopt new skills and techniques to overcome the challenges related will new technologies.

PSO5: Students will be able to understand the fundamental theories, consents and application in basic areas of research development the ability to explore nwe areas of research.

### **Course outcome of U. G. Physics**

CO1: Machine, Oscillation and properties of matter students will have understanding relative motion, Inertial and non-Inertial frames, study of the interaction of forces between solid in mechanical systems center of mass of mechanical system law of motion and conservative strain and stress Viscosity and surface tension and elasticity.

### **Electricity and magnetism**

CO2: Student will be able to:-

\* Understand the relationship between electrical charge, electrical field, potential and magnetism.

\* Understand the dielectric constant, magnetic field and magnetic flux.

\* Understand the Biot-sevart and Ampers law's, grass law etc.

### **Thermodynamics and statistical physics**

CO3: Completion of this course will enable the student to:-

- \* Know the basics the thermal physics
- \* Understand the behavior of real gases
- \* Understand the kinetic theory of gases:Maxwell-Boltzmann, Bose-Einstein, Fermi-Dirac statics.
- \* Understand the probability and thermodynamics probability.

### **Wave, Acoustics and optics**

CO4: Students will be able to:-

- \* Understand the role of the wave equation.
- \* Understand superposition of harmonic waves.
- \* Understand optical phenomena such a interference and difference.
- \* Optical phenomena such as polarization.
- \* Understand the laser system and various application of laser.

### **Relativity, Quantum mechanics, atomic, molecular and nuclear physics**

CO5: Completion of this course will enables the students to:-

- \* Understand of important of quantum mechanics compared to classical mechanics.
- \* Understand bof Schrodinger's equation.
- \* Basic properties of nucleus and nuclear models to study the nuclear structures properties.
- \* Nuclear fission and fusion.

### **Solid state physics**

CO6: students will have understanding of:-

- \* Structures in solids and their determination using XRD.
- \* Behavior of electrons in solid including the concept of energy bonds.

### **Electronics device**

- \* The semiconductors, diodes, and various transistor.
- \* In brif discuss the rectifier, and amplifiers.

## **Program Outcome of Mathematics**

PO1:- understanding of the fundamental axiom in mathematics and capability of developing ideas based on them .

PO2:- A student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notions ,terminology.

PO3:-A student should get adequate exposure to global and local concerns that explore them many aspects of mathematical science.

## **Course outcomes of B.Sc. 1st year**

### **Algebra and trigonometry**

Co1 :- student skills to solve inverse of matrix ,rank,Eigen valueEigen vectors .

CO2 :- student skills to solve system of linear equation both homogeneous and non homogeneous .

Co3:- student will learn convergence modulo,group theory subgroup ,cyclic group ,coset ,normal subgroup ,Quotient group even and odd permutation .

Co4 :- student will learn homogeneous and isomorphism group ring ,subring integral domain and field etc.

Co5:- student compute Demoiver theorem and how to find the expansion of trigonometrical function .

### **Differential calculus , Integral calculus,ordinary differential equations.**

Co1 :- student compute theorems and learn how to check continuous, discontinuous and differentiability .

Co2 :- understand Asymptotes curvature and test for concavity and convexity.

Co3 :- understand definite integrals reduction formula, volumes and surface .

Co4:- learn clairauts form ,exact differential equation, singular solution and their solutions.

Co5:- solve the problem on transformation of the equation by changing the dependent / independent variable.

## **Vector analysis and geometry**

Co1:- student skills to solve problem based on gradient , divergent and curl.

CO2 :- student skills to solve problem based on theorem of gauss ,green and stokes.

Co3 :- learn the concept of conics confocal conics .polar equation of a conic .

Co4 :- solves the problems on sphere, cone, cylinder.

## **Course outcomes of B.Sc. 2nd year**

### **Advanced calculus**

Co1:- student will be able to know the sequence, convergence and divergent of sequence.

CO2 :- student skill to solve theorem and problem based on continuity , uniform continuity, mean value theorem .

Co3 :- students compute different theorem Euler ,Taylor's and jacobians .

Co4:- student skills to solve maxima,minima and saddle point of function of two variable.

Co5:- student skills to solve beta and gamma function ,double and triple integrals .

## **Differential equations**

Co1:- the differential equation and solve them .

CO2:- student skills to solve Laplace transformation.

Co3:- the partial differential equation of 1st order and solve them .

Co4:- partial differential equation second and higher order and solve them.

Co5 calculus of variations and solve them.

## **Mechanics**

Co1:- student compute stable and unstable equilibrium.

CO2:- student will have knowledge of null lines and planes.

Co3:- understands the concept of direction,projectile ,central orbits .

## **Course outcomes of B.Sc. 3rd year**

### **Analysis**

Co1:- student will able to know the series of real number . Convergence and divergence of series .

CO2:- determine the Riemann integrability .

Co3:- Aplly the concept of Cauchy rieman equations for analytic function .

Co4:- student will learn limit point, interior point, open and closed set, boundary point, subspace of a metric space.

Co5:- student will learn compactness, connectedness, components.

## **Abstract algebra**

Co1:- student will have the knowledge of conjugacy relation, normaliser, class equation, Sylow subgroup.

CO2:- student understand the quotient ring, unique factorization domain, modules, submodules.

Co3:- learn the concept of vector space, subspace, linear span, dimension of sums of subspace.

Co4:- understand the concept of linear transformation, bilinear and quadratic.

Co5:- inner product space and solve them.

## **Discrete mathematics**

Co1 :- student will learn ordered set, grammars, language, permutation, combinations.

CO2:- student will have the knowledge of partial order relation, lattices, chain and antichain.

Co3:- student skills to solve Boolean lattices, Boolean function and expansion.

### **Program outcome (Commerce)**

PO 1: This program provides knowledge about accounting work related to business and factors affecting business activities.

PO 2: This program acquaints students with accounting concepts, tools and techniques for managerial decision.

PO 3: This program provides knowledge of business law and provisions related to consumer protection.

PO 4:This course develops students communication and Writing skills which helps in getting success in business and personal life.

PO 5:This course provides essential knowledge about business management through management functions which helps in management works.

PO 6:This program helps students to acquire knowledge about statistical tools and techniques for design making as well as decision making.

PO 7:This program helps students to understand The basic concept and the tools used in cost accounting such as labor cost ,contract costing and operating costing.

PO 8:This program provides knowledge about companies laws and regulations and its functions to the students.

PO 9:This program provides knowledge about entrepreneurship to improve thinking of self employed.

PO 10:This program helps students to understand tax collection and calculation by government .

PO 11:This course facilitates understand of the framework of marketing and it's applications in decision making under the various marketing environment.

PO 12:This program provides knowledge to students about international marketing environment to understand the international opportunities and international market.

PO 13:This program provides basic knowledge about auditing for further studies.

PO 14: Capability of the students to make decisions at personal & professional level will increase after completion of this course.

PO 15:This program helps students to understand the banking system in India.

PO 16:This Program helps in understanding the insurance concepts.

PO 17:This program provides knowledge about GST to understand the importance of indirect tax in India and global economy and it's contribution to the economic development.

PO 18: This program helps to understand and appreciate the basic micro and macro economics and their application to the business.

PO 19: This program provides mathematical information which helps in business activates.

### **Special program outcome**

SPO 1:Students will be able to do their higher education and can make research in the field of finance and commerce.

SPO 2:The students can get the knowledge, skills and attitudes regarding business works during the end of the b.com degree course.

SPO 3:Students will prove themselves in different professional exams like, CA,CS,CMA etc.

SPO 4: The students will acquire the knowledge, skill in different areas of communication, decision making, innovation, problem solving in day to day business activities.

SPO 5: Students will understand the importance of social responsibilities and it's a part of business objectives.

## **Course Outcome**

### **Financial accounting**

CO 1: Understand the accounting principles, concepts and convention and to identify various subsidiary books in accountancy.

CO 2: Knowledge about business profit and loss account and balance sheet.

CO 3: Understand the various methods of calculating depreciation.

CO 4: To enable students to learn the basic concepts of Partnership Accounting, and allied aspects of accounting.

### **Business mathematics**

CO 1: Knowledge about Methods of Solving Equations.

CO 2: Knowledge about Matrices and Determinants.

CO 3: Knowledge of Simple interest and Compound Interest.

CO 4: Knowledge of Ratio & Proportion .

CO 5: Knowledge of Commission, Brokerage, Discount, Profit and loss.

### **Business communication**

CO 1: knowledge about importance of communication.

CO 2: Practice modern forms of communication.

CO 3: Improvement in writing skills.

CO 4: Improvement in presentation.

CO 5: Knowledge of Modern Forms of Communicating.

### **Business Regulatory Framework**

CO 1: Understand the law and procedure of the contracts.

CO 2: Analyze performance and the remedies.



CO 3: Summarize sale of goods and rights and duties of buyer and seller

CO 4: Knowledge about Negotiable Instruments

CO 5: Knowledge of Consumer Protection.

### **Business environment**

CO 1: To make the students aware about the Business and Business Environment.

### **Business economics**

CO 1: Understand the role of business economics in decision making.

CO 2: Analyze the demand determinants and measuring price elasticity of demand.

CO 3: Analyses the peculiarities of factors of production.

CO 4: Knowledge of market structure.

### **Computer Application**

CO 1: Understand the fundamentals and components of computer.

CO 2: Provide the knowledge about an overview of E- Commerce and E-business.

CO 3: Analyze the different types of E-marketing techniques.

### **Corporate accounting**

CO 1: Understand the procedures for the issue of shares.

CO 2: Prepare Financial Statements of Companies.

CO 3: Knowledge of Amalgamation.

CO 4: Consolidated Balance Sheet of holding

Account of Banking Companies.

companies with one subsidiary only.

### **Cost Accounting**

CO 1: Understand the importance of costing in companies.

CO 2: Accounting for Labour.

CO 3: Ascertainment of cost.

CO 4: Gain knowledge about losses in process costing.

### **Principles of business management**

CO 1: Develop knowledge about management.

CO 2: Have a better understanding of planning and decision Making.

CO 3: Give an idea about organization, departmentation and Delegation.

CO 4: Familiarise with directing, motivation theories, communication process and leadership.

CO 5: Provide idea about requirements of coordination, control Process.

## **Company law**

CO 1:Information of company and its types.

CO 2: Knowledge of companies rules and regulations.

CO 3:Information of companies management.

CO 4:Information of Companies meetings and its winding up.

## **Business statistics**

CO 1: Explain the primary concepts of statistics, data collection, sampling and tabulation.

CO 2: Understand the concepts of measures of central tendency and solve problems.

CO 3: Understand the various measures of dispersion and solve related problems.

CO 4: Develop the ability to solve problems in correlation and regression analysis.

CO 5: Calculate the index numbers and understand the concept of time series and their application.

## **Fundamentals of entrepreneurship**

CO 1: Understand the functions of entrepreneur and its qualities.

CO 2: Understand various dimensions of entrepreneurship.

CO 3: Entrepreneurial Behavior and its theories.

CO 4: Entrepreneurial Development Programs and government contribution.

CO 5:Role and contribution of Entrepreneur in development of economy of a country.

## **Income tax**

CO 1: Understand the meaning of person, assessee, previous year, assessment year, total income, Identify the residential status and incidence of tax and solve problems.

CO 2: Compute taxable income from salary and house property.

CO 3: Understand the meaning of business and profession and compute taxable income. Capital gains, Income from other sources.

CO 4: Computation of Tax Liability : Set-off and carry forward of losses; Deduction from gross total income. Aggregation of income; Computation of total income and tax liability of and individual, H.U.F., and firm.

CO 5: Tax Management for better tax money saving.

### **Indirect tax with GST**

CO 1: Understanding of custom duty and its procedure.

CO 2: Detail study of State Excise during calculation of Tax.

CO 3: Detail study of goods and services tax.

### **Management accounting**

CO 1: Understand the objectives and functions of management Accounting and ratio analysis.

CO 2: Preparation of Funds Flow Statement as per Indian Accounting , cash flow statement.

CO 3: Marginal and differential costing as a tool for decision making.

CO 4: Knowledge about Budgeting for profit Planning and control.

CO 5: Knowledge of Standard Costing and Variance Analysis.

### **Auditing**

CO 1: Gain knowledge about auditing, audit programmes, working papers and preliminaries before audit.

CO 2: Analyse about implementing internal check and internal control in concerns.

CO 3: Knowledge of auditing of a company.

### **Financial management(finance area)**

CO 1: Knowledge of capital structure and its management ,

CO 2: Knowledge to invest in a better way.

### **Financial market operation(finance area)**

CO 1: Knowledge of money market and capital market ,rules and provisions regarding securities

CO 2: knowledge of stock exchange and financial services.

### **Principles of marketing(marketing area)**

CO 1: Understand the Modern marketing concepts.

CO 2: Providing knowledge about marketing mix, segmentation, targeting and positioning.

CO 3: Get clear idea of product planning, Diversification, Elimination and pricing strategies.

CO 4:Methods of distribution and promotion.

### **International marketing(marketing area)**

CO 1: Understand the International marketing.

CO 2: Identifying and Selecting Foreign Market .

CO 3: knowledge of International Distribution methods.

CO 4: Understanding of Export Policy and Practices in India.

### **Essential of E- commerce**

CO 1: Knowledge of internet and commerce.

CO 2: knowledge of E -commerce and it's application.

CO 3: Emerging Business Models.

### **Information technology and it's applications in business**

CO 1: Information Revolution and information Technology (IT)

CO 2: Knowledge of Fundamentals of Computer.

CO 3: Knowledge of Computer-based Business Applications and use of internet.

### **Fundamentals of Insurance**

CO 1: Knowledge of Insurance and economic development and it's procedure.

CO 2: Procedure for Becoming an Agent .

CO 3:Basic Knowledge of becoming an agent.

CO 4: Knowledge of life insurance.

### **Money and banking system.**

CO 1: Alternative Measures to money supply in India.

CO 2: Indian Banking System and it's function.

CO 3: Role and functions of Reserve Bank of India.

### **Programmr Outcome Geography**

P.O.1 To understand the scope and evolution of the diverse discipline of Geography,

P.O.2 Students will gather knowledge about the fundamental concepts of Geography and will have a general understanding about the geomorphologic and geotectonic process and formation. skills and holistic understanding of the Earth, atmosphere, oceans and the planet through analysis of landform development; crustal mobility and tectonics, climate change,

P.O.3 They will analyze the problems of physical as well as cultural environments of both rural and urban areas, Understanding the functioning of global economies, Analyzing the differential patterns of the human habitation of the Earth, through studies of human settlements ,Understanding and accounting for regional disparities, poverty, unemployment and the impacts of globalization

P.O.4 Training in practical techniques of mapping, cartography, interpretation of maps, photographs and images etc; so as to understand the spatial variation of phenomena on the Earth's surface.

P.O.5 As a student of the programme they will enrich their observation power through field experience and in future this will be helpful for identifying the socio- environmental problems of their community.

### **Course Outcome Physical Geography**

C.O.1 • Understand the theories and fundamental concepts of Geotectonic and Geomorphology. Understand earth's tectonic and structural evolution.

C.O.2 Gain knowledge about earth's interior. Develop an idea about concept of plate tectonics, and resultant landforms.

C.O.3 • Acquire knowledge about types of folds and faults and earthquakes, volcanoes and associated landforms,evaluation of landscape

C.O.4 •understand elements of weather and climate composition and structure of the atmosphere atmospheric temperature,pressure and wind how atmospheric moisture works,climate classification of koppen and thornthwait

C.O.5 gain knowledge about Surface relief of ocean,distribution of temperature and salinity of ocean and sea,currents,tides,coral reefs and oceanic resources

### **Human Geography**

- C.O.1 Gain knowledge about definition and scope of human geography,determinism,possibilism and probabilism ,human development index
- C.O.2Understand human races their characteristics and distribution,human adaptation to environment
- C.O.3Gain knowledge about world population and factors influencing spatial distribution,over,under,and optimum population, migration of population
- C.O.4Acquire knowledge about urban settlements- Urbanisation,evolution and classification,trends of urbanisation ,rural settlements-characteristics,type and regional pattern,rural houses in India
- C.O.5 understand issues- global warming,climate change,deforestation,desertification,air,water and soil pollution

### **Cartography and stastistical methods**

- Develop concepts and skills regarding scale,
- representation of different landforms by contours,

- graph and diagram,
- Gain knowledge about mean , median and mode
- Learn the usages of chain and tape survey

#### Economic and resources Geographhy

- C.O. 1 -Understand the concept of economic geography,And the concept and classification of resources  
 C.O.2 Knowledge gain about mineral resources,power resources,resource conservation,principal crops  
 C.O.3 Analyze the factors of location of agriculture and industries.  
 C.O.4-Gain knowledge about world transportation,international trade and major trade blocks effect of globalisation on developing countries  
 C.O.5-Understand the concept of conservation of resources, policy making and sustainable development

#### **Geographhy of India**

- C.O.1- understand the physical features of India  
 C.O. 2-gain knowledge about natural resources type,their distribution and characteristics in India  
 C.O. 3 - learn about cultural features-population,major crops,green revolutions and agricultural regions  
 C.O.- 4 gain knowledge about major industries location,development and production  
 C.O. - 5 detailed study of Kashmir valley,north east region,chhota Nagpur plateau,that desert and islands of India

#### **Map interpretation,projections and statistical methods**

- 1 • Understand and prepare dot map,choropleth map and isopleth map
2. develop a skill to prepare conical,zenithal and cylindrical projection
3. Use of meteorological instruments and interpretation of weather maps
4. understand statistical methods
- 5• Do field surveys using prismatic compass

#### **Remote sensing and GIS**

- C.O.1- understand basics of remote sensing- history and scope,electro-magnetic radiation,spectral regions  
 C.O.2-learn about types of remote sensing,remote sensing satellites,platform and sensors  
 C.O.3- knowledge gain about visual and digital image processing techniques,remote sensing in india  
 C.O.4-understand definition of geoinformatics it's scope, importance,history,components  
 C.O.5-understand data model and data analysis

#### Geographhy of Chhattisgarh

- C.O.1 understand physical features of Chhattisgarh  
 C.O.2 learn about natural resources types,characteristics and their distribution  
 C.O.3 knowledge gain about agriculture and population  
 C.O.4 knowledge gain about major industries and industrial regions of Chhattisgarh  
 C.O.5 knowledge gain about trade and transport ,tourism,socio-economic development of Chhattisgarh

#### **Map reading and interpretation**

- C.O.1 Develop the skill of graphical representation  
 C.O.2 Gain knowledge about topographical sheets  
 C.O.3 gain knowledge about satellite imageris  
 C.O.4 do feild survey using palne table and elided  
 C.O.5 Have expertise in survey of micro region

## **Program outcome of Economics**

- PO1: Theoretical study of creative units of economic and consumer and production.
- PO2: Nature of market and pricing of Instruments comprehensive study.
- PO3: welfare Economics and concept of social welfare function.
- PO4: concept of national income and role of national income in economics development.
- PO5: Study of employment theory and working of investment multiplier and various aspects of international trade.
- PO6: Economic development and the role of the theory of economic development in the development of different economic.
- PO7: concept of physical capital and role of agriculture in economics development.
- PO8: features of indian economy and economic planing and policies.
- PO9: India's industrial policies and role of foreign trade.
- PO10: A comprehensive study of the economic functions of monetary , banking and revenue.
- PO11: The systematic study of statistical research and methods.

## **Program specific outcome of Economics**

- POS1: Ideal economic behaviour knowledge of ideal situation of consumer and production economic problem study.
- POS2: By studying the market problem , the choice of the ideal market and the knowledge of determining the means of production.
- POS3: knowledge of ideal condition of economic welfare and increase in social welfare.
- POS4: knowledge of economic development , growth and human condition from the study of national income.
- POS5: study of appropriate employment theory estimation of increase in income and output from investment-multiplier activity.
- POS6: study of economy and role of an ideal economic development theory in economic development of a country.
- POS7: Intellectual capital is an indicator of economic growth and progress and ideal condition
- POS8: Policy marking for development by studying indian economy.
- POS9: choosing an ideal policy for industrial development and foreign trade.

POS10: To make economic progress by adjusting income, expenditure and debts by formulating monetary and revenue policy

POS11: To establish an ideal result by studying statistical research and methods.

### **COURSE OUTCOME**

CO1: From this unit students will have a fine and theoretical knowledge of economics.

CO2: The study and knowledge of the basic principles of maximizing the welfare of the individual and society.

CO3: Received information about different types of market action and competition and pricing.

CO4: The concept of national income and measurement of national income has been studied by studying this course.

CO5: knowledge of the effect of the employment and investment multiplier on the development of economics.

CO6: study of economic growth and development and study of mature and constraints of development of a country.

CO7: The study of the development of intellectual capital and its role in the development of an economy.

CO8: From the study of this course the nature of the Indian economy, knowledge of the means of development.

CO9: study of India's industry and foreign trade structure policy-making from the study of this unit.

CO10: Study of the impact of India's monetary and fiscal policy on an economy by studying this course.

CO11: How does statistical research and methods affect a researcher's study and help in policy making for the economy and human welfare.

### **Program Outcomes of U.G. Political Science**

PO 1: Political science meaning, power of human behaviour, power and knowledge of method of study.

PO 2: Information about Indian national movements.

PO 3: Knowledge of Indian constitution, fundamental rights, fundamental duties and three parts of governance.

PO 4: Western political thinkers, knowledge on politics by Indian political thinkers.

PO 5: Comparative knowledge of foreign rule, knowledge of constitution.



PO 6: Meaning of international politics, different theories national interest study approach thoughts on.

PO 7: Comparison in public administration, private administration, organization theory order unity delegation.

PO 8: Public welfare state, parties method, social change, feminism knowledge of nationalism.

PO 9: Information about the states governance system caste, religion, language and panchayati raj.

PO 10: Political culture development proper knowledge of concept socialization.

### **Program Specific Outcomes of U.G. Political Science**

PSO 1: Comparative politics acquiring knowledge of this subject a student will be able to deal with theoretical evaluation and approaches to the study of politics.

PSO 2: Comparing will give knowledge of administration.

PSO 3: In the study of public administration there will be knowledge of responsibility towards the public.

PSO 4: Knowledge of administration efficiency.

PSO 5: Gain knowledge of groups like non-alignment arms control and disarmament.

PSO 6: Gain knowledge on important contemporary in international politics.

PSO 7: Knowledge of the nature and importance of political theory by Western political thought.

PSO 8: Political theory in modern indian is distinctly aware of tradition.

### **Course Outcomes of U.G. Political Science**

CO 1: Acquiring proper knowledge political science a student may able to understand various political issues and find best solution from their surroundings.

CO 2: In indian governance and politics the constitution acquires the knowledge of the parliament the legislature.

CO 3: Administrative post the president, vice president, prime minister takes knowledge of the work and power of his ministers etc.

CO 4: By studying the party system the national party acquires the knowledge of regional parties and independent parties.

CO 5: From the justice system the student gets knowledge of the judicial system of his country and the working power of the judges.

CO 6: Gain knowledge of the administrative system of different countries at the international level.

CO 7: Knowledge of the United nations organization and its organizations.

CO 8: One can get knowledge of the constitutions of different countries.

CO 9: To take the knowledge of the idea of foreign thinkers.

**Program outcomes of UG English literature and languages.**

PO 1. Imbibe moral and human values through study of English language and literature.

PO 2. Make special use of language for their expression.

PO 3. To make accurate use of English language in their respective field and communicate effectively.

PO 4. Get acquainted with the language, poetical style, and diction to interpret any literary text.

PO 5. Make proficient in English language to improve their employability.

PO 6. To understand the usage of words and phrase in communicative skills.

PO 7. Comprehend various forms of literature like prose, poetry, drama and fiction

PO 8. Apprehend different cultures and cultural sensibilities around the world

PO 9. Perspectives of literary movements that existed in different ages.

**Program specific outcomes of UG English literature and language.**

PSO 1. Develop the knowledge of grammatical system of English language.

PSO 2. Define literary theory and terms in criticism.

PSO 3. Develop four language skills LSRW.

PSO 4. Scope of employability and entrepreneurship in the field of Media and Journalism, Teaching, public relation, human resource, civil service, creative writing etc.

**course outcomes of UG English literature and language.**

on the completion of course the students are able to.

CO 1. Analyze the text for understanding content.

CO 2. Study basic English grammar and composition for developing communication skills.

CO 3. Study and understand poetic type and trends.

CO 4. Express creativity through writing poems.

CO 5. Understand and comprehend the significance and relevance of English as an international language.

CO 6. To develop one self as an learners of language.

CO 7. To compete in general English paper in career oriented exams.

**Program outcomes of U.G. History**

PO 1 By studying history students will get information about the meaning of history, geography of india and all periods.

PO 2 Through the study of history students will get the political, economic, cultural and social knowledge of Rigvedic and later vedic period.

PO 3 By studying history students get information about the literature and culture of Chandra gupta maurya.

PO 4 By studying history students will get information about all the years of acient india history.

PO 5 students will get complete knowledge of chhattishgarh by studing.

PO 6 By studying history students will get information about the modern religious reform movement in Europe.

PO 7 By studying history give student information about commercialism civil war.

PO 8 By studying history students will get knowledge about America's freedom struggle napoleon etc.

PO 9 Study of history reveals rule of eastern problem.

PO 10 Study history students will gain insight into integration home and poreign policy.

### Program specific out comes of U.G. history

PSO 1 student should acquire the skill to explain how and why important events happen.

PSO 2 student should understands and. Comprehend the histrocial method of study.

PSO 3 student should assess and comprehend the evidence collected from historical sources.

PSO 4 student should have critical understanding of development in historiography.

PSO 5 student should have explicit about the multiple culture and diversity

PSO 6 students should have knowledge of current historical debates.

PSO 7 student should understand the skill that are used bit historians in research.

PSO 8 students should have knowledge of the history of the india and 20<sup>th</sup> century modern world.

### Course outcomes of U.G. History

CO 1 Survey of source of Indian history and geographical features of India.

CO 2 Rig Vedic and later Vedic Period society polity, economy, culture and religion, social development Varna, Jati and occupational categories, marriage and property relations.

CO 3 Rise of Magadha Empire – Invasion of Alexander and its effects. The mauryan Empire state

CO 4 post gupta development pallave, chalukya, Vardhan, gurjaras, pratiharas, palas, senas, rashtrakulas.

CO 5 introduction to chhattishgarh naming and geographical location, major regional dynasties, kalchuri dynasty .

CO 6 Features of the modern age in Europe Remaissande reformation movement and anti reformation movement.

CO 7 Economic origins of the modern western world commercial revolution and mercantilism.

CO 8 American war of independence , the French revolution and the reign of terror.

CO 9 revolutionarisim matternic internal and foreign policy revolution of 1830 AD and 1848AD in Europe .

CO 10 unification of Italy unification of germany bismarck's home policy and foreign policy.

## समाजशास्त्र

### PROGRAM OUTCOME U.G.

PsO:1 विद्यार्थी मनोवैज्ञानिक ज्ञान अर्जित कर सकते हैं।

PsO 2: समाजशास्त्र अध्यन के करने के बाद विद्यार्थी विभिन्न प्रकार के प्रतियोगी परीक्षा एवं नौकरी अर्जित कर सकते हैं

PsO 3: जनगणना के बारे मे जानकर जनगणना विभाग में वे अपना योगदान देने में सक्षम होंगे।

PsO 4: स्वास्थ्य विभाग में भी विद्यार्थी अपना योगदान दे सकते हैं

PsO 5: महिला एवं बाल विकास के क्षेत्र में यदि विद्यार्थी को सेवा का अवसर मिल तो वे बखुबी निभायेंगे।

PsO 6: समाज कल्याण के क्षेत्र में भी अपना योगदान दे सकते हैं

P.o.1 छात्र समाज में परिवार एवं नातेदारी के महत्व की भूमिका जैसे व्यक्तित्व विकास सामाजिक सुरक्षा एवं जैविकीय प्राणी से सामाजिक प्राणी बनाने जैसे महत्वपूर्ण भूमिका को समझकर अपने आने वाले कल के लिए एक बेहतर नातेदारी की भूमिका अदा करेंगे।

P.o.2:छात्र सक्षम होंगे सामाजिक मुद्दे और इसके वैश्विक प्रभाव पर गंभीर रूप से सोचने में।

P.o.3 : विद्यार्थी समाजीकरण की प्रक्रिया को जीवन पर्यत अपनाएंगे।

P.o.4: विद्यार्थी समाजशास्त्र की उपयोगिता को समझकर समाज में व्याप्त समस्याओ के निराकरण के उपाय खोजने में सक्षम होंगे।

P.o.5: छात्र को सामाजिक परिवर्तन की व्यापक पृष्ठभूमि पर अपने आपको कैसे समायोजित करना है, इसकी जानकारी प्राप्त होगी।

P.o.6: विद्यार्थी सामाजिक सुदृढ़ता को समझकर समाज में जीवन से जुडे मसौदा तैयार करने में सक्षम होंगे।

P.o.7: विद्यार्थी जानेगे कि समाज का कैसा क्रमबद्ध विकास हुआ, तथा प्रत्यक्षवाद अर्थात तार्किक प्रकृति को अपनाकर अपने बौद्धिकता का परिचय देंगे।

- P.o.8: सामाजिक अनुसंधान का वैचारिक आधार प्रभावी ढंग से संचार और सामाजिक अवधारणाओं जो कि जीवन से जुड़े सिद्धांत का मसौदा तैयार करने में सक्षम होंगे।
- P.o.9: विद्यार्थी अपने भारतीय संस्कृति एवं सभ्यता से अवगत होकर उसे अपने जीवन में उतारने का प्रयास करेंगे।
- P.o.10: छात्र अपराधशास्त्र को पढ़कर अपराध और दण्ड को समझने में सक्षम होंगे तथा वे कानून एवं समाज सम्मत व्यवहार करेंगे।
- P.o.11: छात्र समाज में व्याप्त सामाजिक व्याधि जैसे: मद्यपान, मादकद्रव्यव्यसन, अपराध, बाल अपराधगणि का वृत्ति आदि से परिचित होकर इसे दूर करने के कारगर उपाय खोजेंगे।
- C.0.1: समाजशास्त्र के प्रकृति, समूह, समुदाय, संस्था, प्रिस्थिति तथा भूमिका को समझेंगे।
- C.02: आधुनिकता एवं उत्तर आधुनिकता के संदर्भ में विभिन्न विद्वानों के मत को छात्रों ने जाना
- C.03: माल्थस के जनसंख्या के वृद्धि सिद्धांत को छात्रों ने समझा
- C.04: छात्र विवाह के पद्धति एवं परिवार तथा नातेदारी के बारे में जाने।
- C.06: छात्र वर्ण ,धर्म ,कर्म, पुरुषार्थ तथा आश्रम व्यवस्था से अवगत हुए
- C.07: विद्यार्थी नौकरशाही, सत्ता, अतिरिक्त मूल्य के सिद्धांत तथा सामाजिक एकता के सिद्धांत से अवगत हुए।
- C.08: छात्र औद्योगिक नीति , औद्योगिक स्थापना ,श्रम एवं श्रमिकों की समस्याओं तथा आवश्यकताओं और श्रम कानूनों से अवगत हुए।
- C.09: नगर एवं ग्रामीण समाज से अवगत हुए
- 10: छात्र अपराध एवं बाल अपराध तथा दण्ड के सिद्धांत से अवगत हुए

## PROGRAM OUTCOME PG

- P.O.1. विद्यार्थी समाजशास्त्र की उपयोगिता को समझ कर समाज में व्याप्त समस्याओं के निराकरण के उपाय खोजने में सक्षम होंगे
- P.O.2. विद्यार्थी सामाजिक सुदृढ़ता को समझ कर सामाजिक जीवन से जुड़े मसौदा तैयार करने में सक्षम होंगे
- P.O. 3. विद्यार्थी जानेंगे कि समाज का कैसा क्रमबद्ध विकास हुआ तथा प्रत्यक्षवाद अर्थात तार्किक प्रकृति को अपनाकर अपने में
- P.O. 4. सामाजिक अनुसंधान का वैचारिक आधार प्रभावी ढंग से संचार और सामाजिक अवधारणाओं जो कि जीवन से जुड़े सिद्धांत का मसौदा तैयार करने में सक्षम होंगे
- P.O.5. विद्यार्थी अपने भारतीय संस्कृति और सभ्यता से अवगत होकर उसे अपने जीवन में उतारने का प्रयास करेंगे

## COURSE OUTCOME P.G.

## द्वितीय सेमेस्टर

- C.O.1. इकाई प्रथम का अध्ययन करने पर विद्यार्थी गण आधुनिकता एवं उत्तर आधुनिकता की अवधारणा से परिचित होंगे
2. इकाई द्वितीय का अध्ययन करने के बाद विद्यार्थी का संरचनात्मक एवं प्रकार्यात्मक सिद्धांत के अंतर्गत टॉलकाट पारसंस का सामाजिक व्यवस्था एवं कार्य तथा आर के मर्टन का प्रकार्यात्मक एवं कार्यात्मक तथा नवप्रकार्यात्मक सिद्धांत से अवगत हुए
3. इकाई 3 के अध्ययन करने पर छात्र गण संघर्ष के सिद्धांत में डेहरन डार्फ एवं कोजर का सिद्धांत तथा आर कॉलिंग्स एवं कार्ल मार्क्स के सिद्धांत को जाना
4. इकाई 4 अध्ययन करने पर प्रघट ना शास्त्र क्या है, से अवगत हुए एवं एडमंड तथा शूटज के विचार को जाना एवं गारपफिकल के विचार से छात्र गण अवगत हुए
5. इकाई 5 का अध्ययन करने पर भारतीय समाजशास्त्र सिद्धांत जिसमें राधा कमल मुखर्जी द्वारा प्रतिपादित सामाजिक मूल्य के सिद्धांत ए आर देसाई का भारत में राष्ट्रवाद के उदय तथा विवेकानंद जी का आलेख भारत का भविष्य एवं जी एस घुरिये द्वारा प्रतिपादित जाति व्यवस्था से परिचित हुए
- C.O.1. इकाई प्रथम के अध्ययन करने पर विद्यार्थी सांख्यिकी के अवधारणा विशेषता उपयोगिता एवं सीमाएं से परिचित हुए
2. इकाई दो के अध्ययन करने पर छात्र गण माध्य माध्यिका बहुलक के अर्थ विशेषता उपयोगिता सीमाएं तथा समस्याओं को जाना
3. इकाई 3 का अध्ययन करने पर तथ्यों के प्रेक्षण प्रदर्शन के अर्थ विशेषताएं प्रकार उपयोगिता तथा सीमाएं से अवगत हुए
4. इकाई 4 के अध्ययन करने पर विद्यार्थी गण तथ्यों का ग्राफिक प्रस्तुति अर्थ प्रकार पद्धति विधि उपयोगिता आदि से परिचित हुए
- 5 . सामाजिक अनुसंधान में कंप्यूटर उपयोगिता समस्याएं एवं संभावनाएं से छात्र गण अवगत हुए

## तीसरा सेमेस्टर

- C.O.1. इकाई प्रथम के पूर्ण होने पर जनसंख्या की अवधारणा स्त्रोत विषय वस्तु विषय क्षेत्र और महत्व जनसंख्या अध्ययन तथा भारत में जनसंख्या को छात्र ने जाना
2. इकाई दो का अध्ययन करने पर जनगणना का अर्थ विशेषताएं योजना एवं जनगणना स्त्रोत तथा महत्त्व से विद्यार्थी गण परिचित हुए
3. इकाई 3 के के बाद छात्र गण भारत में प्रजनन एवं जन्म दर एवं मृत्यु दर जनसंख्या का घनत्व से अवगत हुए
- 4 इकाई 4 के अध्ययन करने पर माल्थस के जनसंख्या का सिद्धांत था हरबर्ट स्पेंसर जनसंख्या का जैविक सिद्धांत कार्ल मार्क्स कार्ल मार्क्स का सिद्धांत तथा इष्टतम जनसंख्या का सिद्धांत से परिचित हुए
5. इकाई 5 का अध्ययन करने पर भारत में अधिक जनसंख्या की समस्या भारतीय सामाजिक सांस्कृतिक पहलू से विद्यार्थी गण परिचित हुए

- C.O.1. इकाई प्रथम के पूर्ण होने पर विद्यार्थी गण अपराध के लिए वैचारिक दृष्टिकोण कानूनी व्यावहारिक और समाजशास्त्रीय दृष्टि कोण विचलन अपराध और अपराध के प्रकार आर्थिक हिंसक सफेदपोश अपराध आदि से विद्यार्थी गण अवगत हुए
2. इकाई दो में अपराध के कारणों परिपेक्ष्य में शास्त्रीय प्रत्यक्ष वादी मनोवैज्ञानिक समाजशास्त्री आदि सिद्धांतके बारे में विद्यार्थियों ने जाना
3. इकाई 3 के पूर्ण होने के पश्चात अपराध और अपराधियों की प्रोफाइल बदलना संगठित अपराध महिलाओं और बच्चों के खिलाफ अपराध साइबर अपराध आदि से परिचित हुए विद्यार्थी गण
4. इकाई 4 सामाजिक समस्याएं शराब और नशीली दवाओं की लत गणिका वृत्ति आत्महत्या आतंकवाद आदि से छात्र गण अवगत हुए
5. इकाई पांच पूर्ण होने पर दंड के सिद्धांत प्रतिशोध निवारक सुधारात्मक उपयोगिता और सजा की लत आदि से विद्यार्थी गण अवगत हुए

#### सेमेस्टर 4 सेमेस्टर

- C.O.1. इकाई प्रथम भारतीय जनसंख्या वृद्धि और प्रक्षेपण की दर जनसंख्या की संरचना भारत में परिवार नियोजन आदि से परिचित हुए छात्र गण
2. इकाई दो भारत में सार्वजनिक स्वास्थ्य सेवाएं को प्रभावित करने वाले कारक भारत में कानून के कारण सार्वजनिक स्वास्थ्य सुधार एवं सुझाव को छात्र गण ने जाना जनसंख्या शिक्षा अर्थ तत्व वस्तुएं एवं महत्व को विद्यार्थियों ने समझा
4. इकाई 4 में भारत में जनगणना जनसंख्या प्रक्षेपण भारत में जनसंख्या नीति से विद्यार्थी अवगत हुए
5. जनसंख्या के विभिन्न वर्षों के आंकड़ा तथा सामाजिक परिवर्तन से परिचित हुए

#### Program Outcomes of U.G. Hindi Language and Literature

- PO1: हिन्दी भाषा का सम्पूर्ण ज्ञान |
- PO2: पारिभाषिक शब्दावली का ज्ञान
- PO3: निबंध की जानकारी।
- PO4: हिन्दी भाषा और उसके विविध रूप का ज्ञान।
- PO5: हिन्दी व्याकरण की जानकारी।
- PO6: विभिन्न प्रकार की शैलियों की जानकारी।
- PO7: पर्यावरण प्रदूषण के बारे में ज्ञान
- PO8: साहित्य के अंतर्गत पद्य गद्य, नाटक, एकांकी के बारे में जानकारी।
- PO9: राष्ट्रभाषा, राजभाषा सम्पर्क भाषा, संचार भाषा का ज्ञान।
- PO10: हिन्दी साहित्य के इतिहास के अंतर्गत विभिन्न कालों के बारे में जानकारी

## Course Outcomes of U.G. Hindi Language and Literature

- CO1: कबीर जायसी के जीवनी, रथनार एवं दोहे के बारे में ज्ञान ।
- CO2: धनानंद कवि के बारे में ज्ञान
- CO3: तुलसीदास के बारे में ज्ञान
- CO4: भक्तिकाल के बारे में ज्ञान ।
- CO5: हिन्दी वर्तनी संबंधी अशुद्धियां का ज्ञान ।
- CO6: अनुवाद व्यवहार के बारे में ज्ञान
- CO7: हिन्दी के प्रमुख कवियों, निबंधकारों, एकांकीकारों एवं उनके साहित्य की जानकारी ।
- CO8: प्रौद्योगिकी एवं नगरीकरण के बारे में ज्ञान ।
- CO9: ऊर्जा के बारे में ज्ञान ।
- CO10: प्रेमचंद की कहानियों, उपन्यासों के बारे में ज्ञान ।
- CO11: कबीर के दोहे का ज्ञान ।
- CO12: उपन्यास, कहानी, नाटक, संस्मरण रिपोतार्ज, आत्मकथा का ज्ञान ।
- CO13: हिन्दी का शब्द भंडार के बारे में ज्ञान ।
- CO14: रस, छंद का ज्ञान