

GOVERNMENT OF MANIPUR
THOUBAL COLLEGE, THOUBAL

The faculties of the College prepare these outcomes as the Manipur University, to which the College is affiliated, does not have any curriculum based out outcomes in the course till date.

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

Department of Botany

Programme Outcome	
Programme Specific Outcome	After completion of the Botany 3 rd year sixth semester, a student will acquire the contents of the subjects, he/ she will be able to practice critical thinking skill, communication skill, quantitative reasoning. Student will acquire problem solving capabilities. They will acquire digital skill and integrate the fundamental concepts with modern tools. They will also strengthen their ethical and moral values and shall be able to deal with psychological weakness. In future they can prepare for state and national competitive examination, especially UGC-CSIR NET and UPSC civil services examinations.

Course Outcomes

Course	Outcome
First Semester BOT-101 (Botany paper- I). Theory	The B.Sc. Botany students of first semester should be able to acquire the knowledge about general character, classification, life cycle, economic importance and reproduction of various plant groups like virus and bacteria, Fungi (Puccinia, penicillium, Mucor, Neurospora etc.), Algae (Oscillatoria, Oedogonium, Vaucheria, Ectocarpus, Polysiphonia etc.), Bryophytes (Riccia, Marchantia, Anthoceros, Pellia, Porella, Sphagnum, Funaria etc.), Pteridophytes (Lycopodium, Selaginella, Equisetum, Isoetes, Marsilea, Dryopteris etc.).
BOT-101 (P) Practical-1	Students will gain the handling skill like section cutting, isolation, staining process, microscope adjustment, identifying criteria etc. of the various species included in the above theory. Also they should possess the knowledge of different plant diseases- their causal organism, symptomology, etiology, control measures etc.
Second semester: BOT-202 (Botany paper- 2) Theory	Second semester students should have the knowledge about the life history, classification, reproduction, economic importance, paleobotanical knowledge of the division Gymnosperm (Cycas, Pinus and Gnetum). Also they should possess the idea of various systems of classification of plant groups with scientific names of the various plant species belonging to their families. In addition to this the knowledge of anatomy, ethnobotany, applied botany, embryology and palynology of some species is to be added.
Botany -202 (P) Practical	The knowledge of plant diversity and identification of various species should be increased by observing a local field study tour with the submission of a report. Students should also possess preparation of section slides for different purposes.
3rd Semester Botany- 303 (Botany Paper- 3) Theory	To enable the students to learn about the various phytogeographical regions of India, Ecological factors, physiological processes, Biochemistry and the molecular structure of genes.
Botany- 303 (P)	To enable the students to learn about the isolation of DNA, distribution of plant

Practical	species by quadrat method , determination of osmotic potential, extraction of chlorophyll pigments, determination of RQ etc. Besides observation and submission of field vegetation is to be mentioned.
4th semester Botany-404 (Botany paper-4-) Theory	The students will have the knowledge of various laws of inheritance , various technique of biotechnology, biometrical application , stages of cell division and principles of plant breeding.
Botany -404 (P) Practical	They can identify and separation of different stages of mitosis and meiosis cell division by staining and mounting . Analysis of various biometrical data with the use of computer , preparation of tissue culture media , inoculation and sterilization of plant material is another important addition in this semester .
5th semester Botany-505 (Botany paper -5) Theory	At the end of 5 th semester ,a student will have the basic knowledge of the following terms of botany . 1) Microbial diversity with their classification. 2) Role of microbes in various industry, agriculture, medical etc . 3) Different pathogen – host relationship and types of various plant disease with their control measures. 4) Importance, evolutionary trends, ecology and economic importance of some lower groups of plants like Bryophytes and Pteridophytes.
Botany- 506 (Botany paper-6) Theory	The learner will conversant with the following concepts thoroughly 1) Origin and evolution of Gymnosperm and their distribution in India. 2) Fossil records of primitive to higher land plants. 3) Advance taxonomy- (molecular taxonomy, application of dna hybridization technique, biochemical marker and dna marker). 4) Role of BSI, Taxonomic classification and economic importance of various families. 5) The various resources, their management and utilization of economic plants , collection and preparation of drugs. 6) knowledge of various tissues – their role in plant growth and differentiation . 7) Embryological knowledge of various plant groups and application of palynology.
Botany -507 (P) Botany -7 Practical	At the end of 5 th semester a student will have practical skill and use of different equipment of the following – 1) Preparation of nutrient Agar and PDA 2) Isolation and culture of bacteria and fungi 3) Microscopic studies of microorganism. 4) Detection and isolation of pathogen and measurement of size of spore of pathogen . 5) Comparative study of reproductive organs of Pteridophytes and Gymnosperms. 6) Various taxonomic related terms of species of different families. 7) Preparation of permanent slide with differential staining of various tissues of higher plants. 8) A thorough knowledge of taxonomy, economic, medicinal uses etc. of different plant groups should be possessed with the help of an external field study tour at nationally important botanical garden/herbaria/research laboratory etc.
6th Semester BOT-608 (Botany-8) Theory	At the end of the 6 th semester student will have an up-to-date thorough knowledge of the following 1) Natural resources, floristic regions of India, conservation , Social forestry, Agroforestry, mineral resources, renewable and non- renewable resources.

	<p>2) Various Ecosystem and pollution, climate change, Biodiversity, Global warming etc. with their control measures.</p> <p>3) Different types of physiological processes, role of micro and macro elements, plant hormones and their role, Photosynthesis – calvin cycle, laws of limiting factors etc.</p> <p>4) Biochemistry of enzymes, Nucleic acid, Protein synthesis.</p> <p>5) Gene structure in prokaryote and eukaryotic organisms, DNA replication, DNA polymerases.</p>
BOT-609 (Botany-9) Theory	<p>The student will have a thorough knowledge of the following</p> <ol style="list-style-type: none"> 1) Kingdom-wise cell structure of prokaryotic and eukaryotic cell, character of Archaeobacteria and mycoplasma, ultrastructure of double membrane system, chemical constituent and models of cell, membrane organization. 2) Knowledge of types of gene interaction, blood group and multiple allele, quantitative genetics. 3) Different plant breeding methods, mutation and polyploidy as method of plant improvement. 4) Totipotency, organogenesis and embryogenesis, isolation and culture of protoplast, clonal propagation, genetic engineering of plants. 5) Application of computer in biological science like analysis of data and application of software for botany, introduction of bioinformatics tools.
BOT-610 (P) -	<p>At the end of 6th semester, a student will have the various practical skill and use of high tech laboratory equipments of the following</p> <ol style="list-style-type: none"> 1) Study of plant community by random and belt transect methods. 2) Determination of density and abundance of vegetation by quadrat size. 3) Water analysis and determination of physical characters of soil. 4) Stomatal frequency of leaf. 5) Pigment separation by chemical and paper chromatography. 6) Estimation of Protein and Starch. 7) Amino acid separation. 8) Measurement of pH. 9) Comparative study of various cell types. 10) Different stages of cell division, chromosome counts, karyotype. 11) Emasculation and bagging of flowers of many families. 12) Preparation of tissue culture, demonstration of technique in vitro culture of various explants. 13) Isolation of plant protoplast. 14) Determination of mean, standard deviation using MS Excel/SPSS.

Department of Chemistry

Programme Outcome	Students will get an understanding of major concepts in all disciplines of chemistry – Inorganic, Organic and Physical. Students will also employ critical thinking and the scientific method to design, carry out, record and analyze the results of chemical experiments and get an awareness of the impact on the environment, regional development, communication skills and other cultures outside the scientific community.
Programme Specific Outcome	The ability to explain chemical nomenclature, structure, reactivity, and function in the field of chemistry. The design and execution of the experiment should demonstrate an understanding of good performer in the chemical laboratory with the proper handling of chemicals and chemical wastes and also explain how the applications of Chemistry relates to our real day to day life.
<u>Course Outcomes</u>	
Course	Outcomes
1 st Sem CH -101 (Theory)	To enable the students to learn the basic functions, atomic structures, chemical bonding, classification of elements in the periodic table, ideas of qualitative and quantitative analyses, reaction mechanisms and different states of matter- gaseous, liquid and solid.
1 st Sem CH-101 P (Practical)	Students will gain an understanding of methods of analysis related to chemical analysis goals such as semi-micro analysis and quantitative analysis.
2 nd Sem CH -202 (Theory)	To acquaint knowledge on acids and bases, oxidation reduction, non aqueous solvents, chemistry of s-block elements, Aromaticity, stereochemistry, study on solutions, colloids and application of laws of thermodynamics in chemistry.
2 nd Sem CH 202 P (Practical)	To enable the students to learn about the use of equipments for determination of different types of melting and boiling points, crystalization techniques and decolourisation of crystals.
3 rd Sem CH -303 (Theory)	Enable the student to get understand metallurgy, chemistry of p-block and d-block elements, co-ordination chemistry, study on some organic compounds and study on chemical equilibrium, knowledge on thermochemistry and deeper knowledge on the laws of thermodynamics.
3 rd Sem CH -303 P (Practical)	To make the students enable to perform physical chemistry experiments, recording, calculation and result finding.
4 th Sem CH -404 (Theory)	To enable the students to know about lanthanides, actinides, noble gases, acids and bases, carboxylic acids and its derivatives, use of organic metallic compounds in organic syntheses, to understand about polymers, catalysis, ionic equilibria and phase equilibria.
4 th Sem CH -404 P (Practical)	To enable the students to perform experiments on analytical chemistry using different types of equipments/reagents like EDTA, DMG, conductometric titrations, verification of Beer Lamberts Law.
5 th Sem (Hons) CH -505 INORGANIC CHEMISTRY (Theory)	Students to learn about nuclear chemistry and radioactivity, chemistry of non-transition elements, 2 nd and 3 rd transition elements, alloys, instrumental knowledge on uv-visible spectroscopy, infra- red spectroscopy, knowledge on environmental chemistry giving emphasis on the structure of the atmosphere.
5 th Sem (Hons) CH -506 ORGANIC CHEMISTRY (Theory)	Deep knowledge on carbohydrates, amino acids, peptides, proteins, nucleic acids, terpinoids, steroids, alkaloids, enzymes, pericyclic reactions, synthetic dyes, chemical knowledge of fats, oils and detergents.

5 th Sem (Hons) CH -507 Physical Chemistry (Theory)	Knowledge on mathematics for chemists, atomic structure and quantum chemistry, photochemistry, energetic, statistical thermodynamics, electromagnetic radiations, macromolecules and conductance, specific heats of solids and Interaction of molecules with electromagnetic radiations
5 th Sem (Hons) CH -508 P Inorganic and Physical Chemistry (Practicals)	<ol style="list-style-type: none"> Shall have the practical knowledge and skills on Preparation of Inorganic complexes like : <ol style="list-style-type: none"> Preparation of sodium tris(oxalato)ferrate(III) Preparation of Nickel Dimethyl glyoxime, [Ni(DMG)₂] Preparation of copper tetra ammine complex, [Cu(NH₃)₄SO₄] Preparation of cis and trans-bis(oxalato) diaquachromium(II) Shall be able to do the experiments like <ol style="list-style-type: none"> Estimation of two constituents from a binary mixture (one volumetrically and one gravimetrically) Estimation of the constituents from the following mixture: Iron and calcium, iron and copper, iron and manganese, copper and zinc, silver and copper, calcium and barium, calcium and lead, calcium and magnesium, copper and chloride, copper and sulphate. Also they will be able to perform Semi-micro analysis Semi-micro analyses of five radicals containing at least one rare element (V, Mo, W, etc.) Silver, lead, mercury, bismuth, copper, cadmium, arsenic, manganese, cobalt, aluminium, iron, nickel, calcium, strontium, barium, magnesium, sodium, potassium, ammonium, chloride, bromide, iodide, fluoride, sulphate, sulphite, thiosulphate, chromate, phosphate, nitrate, nitrite, borate, arsenite, and arsenate Also, they will be able to perform the Physical chemistry experiments : <ol style="list-style-type: none"> Study the equilibrium of the following reactions by the distribution method: <ol style="list-style-type: none"> I₂ in water-Kerosene/Cf.l, $I_2(aq) + I^- (aq) \rightleftharpoons I_3^- (aq)$ $Cu^{2+}(aq) + nNH_3 \rightleftharpoons [Cu(NH_3)_n]^{2+}$ Perform the following potentiometric/pH-metric titrations: <ol style="list-style-type: none"> Strong acid with strong base weak acid with strong base and dibasic acid with strong base Potentiometric/pH-metric titration of Mohr's salt with potassium dichromate. Determination of critical solution temperature and composition of the phenol-water system and to study the effect of impurities on it. Phase equilibria: Construction of the phase diagram of (i) simple eutectic and (ii) congruently melting systems, using cooling curves and ignition tube methods.
6 th Sem (Hons) CH-608 INORGANIC CHEMISTRY (Theory)	After completing this course, students must have knowledge of Bonding in coordination compound including different theories and stereochemistries, factors influencing complex formations with stability constants. Also the students have the knowledge of magnetic properties of transition metal complexes including types of magnetic behaviour, methods of determining magnetic susceptibility, spin only, formula, L-S coupling and applications of magnetic moment data in 3d transition metal complexes. They also will have knowledge of inorganic polymers, Thermoanalytical methods including Thermogravimetric (TGA) and Differential

	Thermal Analysis (DTA), Differential Scanning Calorimetry (DSC)-Basic principles, Instrumentation, Factors affecting thermoanalytical techniques, Application in soils, organic and inorganic compounds and analytical chemistry; knowledge of Organometallic Chemistry and Bioinorganic Chemistry with ability to identify Essential and nonessential trace elements in biological processes, metalloporphyrins with special reference to haemoglobin and myoglobin and Biological role of alkali and alkaline earth metal ions with special reference to Na^+ , K^+ and Ca^{2+} , nitrogen fixation, chlorophyll; knowledge of Inorganic rings and cages and Non-stoichiometric compounds
6 th Sem (Hons) CH-609 ORGANIC CHEMISTRY	<p>The students will be able to give Nomenclature, structural features, Methods of formation and chemical reactions of thiols, thioethers, sulphonic acids, sulphonamides with the knowledge of the E2, E1 and E1cB mechanisms, orientation effects in Elimination Reactions, stereochemistry of E2 Elimination Reactions, elimination Vs substitution, factors affecting the elimination and substitution reactions. Also they will be able to do Organic synthesis via enolates. They also will have the knowledge of Molecular orbital picture and aromatic characteristics of heterocyclic compounds, five and six-membered heterocycles, their synthetic methods and Mechanism of electrophilic substitution reaction of these. Knowledge of Medicinal chemistry on Drugs and antibiotics; synthesis and structure of Sulphadiazine like Sulphadiazine, sulphaguanidine; Analgesics like aspirin, phenacetin; Antimalarials like Plasmoquin, chloroquine and Antibiotics - chloramphenicol with the chromatographic separation techniques.</p> <p>Knowledge on the application and instrumentation of spectroscopic techniques like Mass spectroscopy, Nuclear Magnetic Resonance Spectroscopy and Electron Paramagnetic Resonance Spectroscopy in the structure determination of compounds will also be gained by the students along with the principles and application of green chemistry.</p>
6 th Sem (Hons) CH-610 PHYSICAL CHEMISTRY	After completion of the course students will have knowledge on Introduction to computers and its application in chemistry with a deeper knowledge of quantum chemistry, electrochemistry, knowledge of Raman spectroscopy; Statistical Thermodynamics, Surface Active Agents, Chemical kinetics, Phase equilibria and knowledge of Symmetry operations - products of symmetry operations of various point groups with examples, group multiplication table (C_{2v} , C_{3v}).
6 th Sem (Hons) CH-611P ORGANIC AND PHYSICAL CHEMISTRY PRACTICAL	<p><u>Organic Laboratory</u></p> <p>A. Qualitative Analysis</p> <p>Identification of Organic Compounds; Detection of extra elements (N, S and halogens) and functional groups-phenolic, carboxylic, carbonyl, esters, amines, nitro, anilide, alcohol, halogen derivative of hydrocarbons and hydrochloride in simple organic compounds.</p> <p>B. Organic Preparation:</p> <p>(a) Acetylation of salicylic acid, aniline, glucose and hydroquinone. Benzoylation of aniline and phenol.</p> <p>(b) Aliphatic electrophilic substitution; Preparation of iodoform from ethanol and acetone.</p> <p>(c) Aromatic electrophilic substitution: Nitration: Preparation of m-dinitrobenzene, p-nitroacetanilide. Halogenation: Preparation of p-bromoacetanilide, 2,4,6-tribromo phenol</p> <p>(d) Diazotisation/ coupling : Preparation of methyl orange and methyl red.</p>

	<p>(e) Oxidation: Preparation of benzene from toluene.</p> <p>(f) Reduction: Preparation of aniline from nitrobenzene.</p> <p><u>Physical Laboratory</u></p> <ol style="list-style-type: none"> To study changes in conductance in the following systems <ol style="list-style-type: none"> Strong acid-strong base Weak acid- strong base and Mixture of strong acid and weak acid-strong base Study the kinetics of the following reactions. <ol style="list-style-type: none"> Acid hydrolysis of methyl acetate with hydrochloric acid, volumetrically or conductometrically. Saponification of ethyl acetate. Verification of Lambert-Beer's Law Determination of pK (indicator) for phenolphthalein or methyl red Study the formation of a complex between ferric and thiocyanate (or salicylate) ions.
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DEPARTMENT OF PHYSICS	
Programme Outcome	<p>After the successful completion of the B.Sc. degree (Physics Hons.) students are able to</p> <ul style="list-style-type: none"> ● Enhance the academic abilities, personal qualities and transferable skills so as to develop as responsible citizen. ● Understand the basic concepts, fundamental principles and scientific theories related to various scientific phenomena and their relevancies in the day-to day life. ● Get the skills in handling scientific instruments, planning and performing laboratory experiments. ● Acquire the skills of observations and drawing logical inferences from the scientific experiments. ● Develop scientific outlook not only in the subject concerned but also in all aspects related to life. ● Learn a wide range of problem solving skill. ● Acquire various communication skills such as reading, listening, speaking etc.
Programme Specific Outcome	<p>On successful completion of the B.Sc. degree (Physics Hons.) students are able to</p> <ul style="list-style-type: none"> ● Understand the depth knowledge of various sub – branches of physics ● Identify the area of interest in academic. ● Learn the concepts of Quantum Mechanics, Relativity, Solid state Physics etc. introduced at degree level in order to understand nature at atomic levels. ● Perform jobs in various fields with precision, innovative thinking, clarity of thought and systematic approach.

COURSE OUTCOMES		
SEMESTER	COURSES	OUTCOMES
First	Theory (PHY-101): Mechanics	<p>On successful completion of the course students would have</p> <ul style="list-style-type: none"> ● Acquired basic knowledge of mechanics including gravitation, rotational dynamics, oscillatory motion and special theory of relativity ● Know about the theorems on moment of inertia and their use in calculation of moment inertia of different bodies about different axes. ● Grasped the fundamental of frames of references and transformation laws(both Galilean and Lorentz) ● Learned conservation laws of linear momentum, energy and angular momentum and application of them to solve problems. ● Gained fundamental ideas of special theory of relativity such as length contraction, time dilation, mass energy equivalence etc. ● Learned the harmonic oscillator, including damped and forced oscillators and know the significance of terms like quality factor, damping coefficient etc.
	Laboratory	<ul style="list-style-type: none"> ● Enabled determination of 'g' using a compound pendulum (both bar pendulum and Kater's pendulum) ● Learned how to determine Young's modulus and rigidity modulus (Searle's method and Statical method) ● Know the determination of coefficient of viscosity (Poiseuille's method) and verification of Stoke's law. ● Familiar with the determination of surface tension (capillary rise method) and verification of Jurin's law
COURSE OUTCOMES		
Second	Theory (PHY-202): Thermal Physics and Optics	<p>After successful completion of the course the student is expected to</p> <ul style="list-style-type: none"> ● Understand the principle of calorimeter. ● Become familiar with basic principle and laws thermodynamics. ● Learned about various thermodynamic process and of work done in each of these process. ● Realize the importance of thermo dynamical functions and applications of Maxwell's relations. ● Understand in depth about kinetic theory of gases and radiation (blackbody radiation)and related laws. ● Inspire interest for the knowledge of concepts in wave optics and quantum optics. ● Use in depth the principle of superposition to explain the physics of interference, diffraction and polarization ● Understand the basics of quantum optics like lasers (He-Ne laser and Ruby laser) and harmonic generation
	Laboratory	<ul style="list-style-type: none"> ● Able to construct a thermocouple with elements supplied and hence to determine the melting point of given substance. ● Learned the determination of refractive index of a given liquid using travelling microscope. ● Know the verification of Newton's law of cooling and determination of apparent expansion of a liquid by weight thermometer method. ● Understand the determination of frequency of tuning fork by Melde's method. ● Familiar with determination of co-efficient of linear expansion (optical lever method) thermal conductivity of a metallic rod (Searle's method).

COURSE OUTCOMES		
Third	Theory (PHY-303): Electricity and Magnetism	<p>On successful completion of the course the student will be able to</p> <ul style="list-style-type: none"> ● Acquire basic knowledge about electrostatics and law governing charge distribution. ● Have gained knowledge about bound charges and boundary conditions. ● Realize the importance of application of Ampere's Circuital law. ● Acquire basic knowledge of magnetic properties. ● Understand the relevance of different magnetization and the boundary condition of magnetic field. ● Able to solve a variety of problems related to Faraday's law of electromagnetic induction, self induction and mutual induction. ● Learn about displacement current, Maxwell's equations and electromagnetic wave propagation . ● Study in depth the alternating current and transient current response of LC,CR and LCR circuits(essential of electronic circuits).
	Laboratory	<ul style="list-style-type: none"> ● Become familiar with determination of horizontal component of earth's magnetic field and magnetic moment of magnet (deflection magnetometer method). ● Get a deep knowledge of determination of self inductance and capacitance (Rayleigh's method, de Sauty's bridge method and ballistic galvanometer) ● Know the determination ECE of copper and to convert the given galvanometer into an ammeter and calibrate it with the help of copper voltameter. ● study the determination of refractive index of a prism (spectrometer method). ● Familiar with determination of frequency of A.C. mains (sonometer method).
COURSE OUTCOMES		
Fourth	Theory (PHY-404): Atomic and Nuclear Physics	<p>Successful completion of the course , provide the students</p> <ul style="list-style-type: none"> ● Detailed study of mass spectrographs, atomic spectra and x-rays. ● Learning of the behavior of atom in various states. ● Realization of the impact of magnetic fields in spectra like the Zeeman effect. ● Understanding of a clear picture of nuclear composition and various nuclear models. ● motivation and understanding of energy released by the nucleus during the fission and fusion process. ● A deep knowledge radioactivity, the relevance of nuclear transformation. ● Learning about the working of nuclear detectors and counters. ● Familiar with nuclear particles and working of different particle accelerators. ● Knowing of detailed controlling factors of nuclear reactor and different types of nuclear reactors.

	Laboratory	<ul style="list-style-type: none"> • Knowledge of uses of potentiometer in finding internal resistance of given cell, calibration of an ammeter and measure of current in an external circuit. • Use of Newton's ring method in determining radius of curvature of a convex lens. • Familiar with handling of spectrometer in determining angle of minimum deviation, dispersive power and refractive index of the material of a prism. • study of diffraction pattern of single slit diffraction and determination of wavelength of sodium light using plane transmission grating.
COURSE OUTCOMES		
SEMESTER	COURSES	OUTCOMES
Fifth	Theory (PHY-505): Electronics	<p>After successful completion of the course, the student is expected to</p> <ul style="list-style-type: none"> • Have a basic knowledge of semiconductor physics. • Learn how a semiconductor diode rectifies an input ac signal. • Realize how to construct a transistor amplifier and how its gain varies with frequency. • Get basic idea of advanced transistor like field effect transistor (FET) and oscillators. • Know the development of electronic instruments. • motivate to apply the principles of electronics in their day-to-day life. • Know about various number systems and their applications. • Learn the logic gates. • Get basic idea to operate electronic devices. <p>On successful completion of the course the student will be able to</p> <ul style="list-style-type: none"> • know solving problems on complex variables and apply it to physics • learn about special functions like beta • motivate the students to apply partial differential equations in solving problems of vibrations of stretched string, heat conduction and wave equations. • acquire the knowledge of Fourier series and its applications.
	Theory (PHY-506): Mathematical Physics Laboratory (PHY-507)	<ul style="list-style-type: none"> • Able to construct two input OR, NOT and AND logic gates using p-n junction or transistor. • know about the drawing of characteristics of transistor (CE and CB) and Zener diode • Have clear knowledge about solid state half and full wave rectifiers and determination of ripple factor. • Familiar with the LCR series and parallel resonance circuits and determination of Q-factor. • Understand the basic ideas about semiconductor band gap and its determination of p-n junction diode. • Use of ballistic galvanometer, like the determination of mutual inductance.

COURSE OUTCOMES		
SEMESTER	COURSES	OUTCOMES
Sixth	Theory (PHY-608): Quantum Mechanics	<p>On successful completion of the course, the student will be able to</p> <ul style="list-style-type: none"> ● Become familiar with Blackbody radiation, Photoelectric effect and Compton effect and hence aware how quantum theory emerged. ● Learn Bohr atom model in detail and understand about atomic excitation. ● Gain a clear knowledge about wave properties of particles, de Broglie waves and its implication on the uncertainty principle. ● Get basic idea of wave mechanics and gain the concept of eigen values, eigen functions and learn the basic postulates of quantum mechanics. ● Know to find solutions to Schrodinger's equation for many systems such as particle in a box, Harmonic Oscillator, Hydrogen atom and familiarize with different quantum numbers.
	Theory (PHY-609): Physics of Materials	<p>After successful completion of the course the student is expected to</p> <ul style="list-style-type: none"> ● Have a clear picture of crystal structures and a clear understanding about x-ray diffraction. ● Gain knowledge about electrical and magnetic properties of materials. ● Gain basic knowledge about superconductivity, its underlying principle and its applications. ● acquire the basic knowledge about the physics of low dimensions i.e. nanomaterials and their applications. ● know about the lattice dynamics such as Einstein's and Debye's theory of specific heat.
	Laboratory(PHY-610)	<ul style="list-style-type: none"> ● Able to set up and handling spectrometer to determine the wavelength of unknown source and verification of dispersion formula . ● Use of Fresnel's biprism to determine wavelength of monochromatic light source. ● Able to set up and adjust polarimeter and determination of concentration of a given solution. ● Familiar with handling of CRO to study B-H curve and hysteresis. ● Set up and adjustment of Milikan's oil drop experiment to determine electronic charge. ● Have clear understanding of Thomson's method for determining e/m of electron.

Department of Computer Science

Programme Outcome	1. Will imbibe students to solve real problems, possess team work, Communication skills, and critical thinking that will prepare them for immediate employment and for life-long learning in advanced areas of computer science and related fields.
Programme Specific Outcome	<ol style="list-style-type: none"> 1. Impart an understanding of the fundamentals of Computer Science and its methods to apply in wide range of applications. 2. The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, application program, database and networking for efficient design of computer-based systems of varying complexity.

Course Outcome for B. Sc Computer Science

Course	Course Outcome
1st Semester CS 101 IT Tools and Applications (Theory)	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Understand the basic concepts of computer and its component. • Comprehend the organization of the Control unit, Arithmetic and Logical unit, Memory unit and the I/O unit. • Comprehend the concept of MS Windows environment. • Understand the features of MS Word and excel in the documentation skill. • Understand the features of MS Excel and master in spreadsheet creation, updating and other essential skill of it. • Understand the features of MS PowerPoint and mastering the building up of enticing presentation slides. • Understand the basic terminology of the internet.
1st Semester CS 101P IT Tools and Applications (Practical)	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Develop Practical skills on MS Word, MS Excel, MS PPT and Internet usage. • Understand the basic concepts and the usage of internets, e-mail creation, • Apply online job, resume preparation, social networks etc.
2nd Semester CS 202 Problem solving Techniques and Programming in (Theory)	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Understand the concept of problem solving techniques. • Understand the C language fundamentals viz. Identifiers, keywords, etc. • Understand the flow of control in C programs with loops and control structures. • Understand the concept of Functions.

	<ul style="list-style-type: none"> • Use of arrays of different dimensions, structures and unions. • Understand the concepts of pointers and Files.
2nd Semester CS 202P Problem solving Techniques and Programming in (Practical)	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Develop Programming skills, Compilation, debugging, and execution in IDE, TurboC, CodeBlocks. • Explain the design and algorithmic solution for a given problem. • Construct the flowchart for the computer programs. • Explain the program using Control Statements • Explain the program using Arrays and Functions. • Explain the program using file handling with structure.
3rd Semester CS 303 Digital Logic Design (Theory)	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Illustrate the basic information representation in the computer. • Understand the concept of Binary Logic with Boolean algebra, Boolean functions. • Minimize the Boolean expression using Boolean algebra and design it using logic gates. • Understand the concepts of various components to design stable analog circuits. • Analyze and design combinational circuit.
3rd Semester CS 303P Digital Logic Design (Practical)	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Realize the Logic gates • Implement Logic Circuits. • Implement combinational Circuits.
4th Semester CS 404 Object Oriented Programming in Java (Theory)	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Understand the concept of Object Oriented Approach, its history and evolution. Along with OOPs features. • Understand the features of Java language. • Acquire the knowledge of Objects and Classes- Constructors, overloading concepts, etc. • Understand the available Packages and the I/O streams used in Java. • Apply the core principles of the Object oriented programming using Java Language.
4th Semester CS 404P Object Oriented Programming in Java (Practical)	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Develop Programming skills, Compilation, debugging and execution in NetBeans both in Linux and Windows environment. • Explain the programming language design, syntax and semantics. • Describe the critical thinking skills through solving programming problems. • Explain the standard syntax for java programs and other programming Tools. • Explain the java programs using object oriented class with

	parameters, constructors, utility, calculations, methods including inheritance, test classes and exception handling.
5th Semester CS 505 Data Structures Using C (Theory)	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Select appropriate data structures as applied to specified problem definition. • Implement operations like searching, insertion, deletion, traversing mechanism etc. • Understand the concept of Stacks, Queue and Linked List. • Design advance data structure using Non- Linear data structure. • Determine and analyze the complexity of given Algorithms.
5th Semester CS 506 Computer Networks (Theory)	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Understand the basics of Computer Networks viz., Types of networks, Network topology and Referential models. • Describe the functions of each layer in OSI and TCP/IP model. • Explain the types of transmission media with real time applications. • Describe the functions of data link layer and explain the protocols. • Describe the functions of different layers of TCP/IP Protocol suit and explain their corresponding protocols.
5th Semester CS 507 Data Structures Using C (Practical)	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Implementation of Data Structures and different sorting/searching techniques. • Program Developing skills, Compilation, debugging and execution in NetBeans.
6th Semester CS 608 Database Management Systems (Theory)	<p>Students will be able to:</p> <ol style="list-style-type: none"> 1. Describe the characteristics of database approach, data model, and database system architecture. 2. Describe the ER modelling and relational data model 3. Detail understanding of Oracle and MySql. 4. Explain the features of Java database management systems and Relational database. 5. Analyze the existing design of a database schema and apply concepts of normalization to design an optimal database.
6th Semester CS 609 Operating Systems (Theory)	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Describe the important computer system resources and the role of operating system in their management policies and algorithms. • Understand the process management policies and scheduling of processes by CPU • Evaluate the requirement for process synchronization and coordination handled by operating system • Describe and analyze the memory management and its allocation policy.

	<ul style="list-style-type: none"> Identify use and evaluate the storage management policies with respect to different storage management technologies.
6th Semester CS 610 DBMS and Operating Systems Lab (Practical)	Students will be able to: <ul style="list-style-type: none"> Database Creation, manipulation, Database connectivity using JDBC/ODBC. Implementation of Process management and synchronisation.

B.SC.ZOOLOGY PROGRAMME

Programme Outcome	<p>PO1:- Students gain knowledge and skill in the fundamentals of animal sciences and understand the complex interactions among various living organisms.</p> <p>PO2:-Understand the various animals of different phyla and their distribution, habitat, structures, reproduction, life cycles, relationship and interactions.</p> <p>PO3:- Understand the structure of cell, it' s functions in control of various metabolic functions of organisms, evolutionary processes and behaviour of animals, pathological, physiological processes of animals and relationship of organ systems</p> <p>PO4:- Understand the practical method of study in various fields of Zoology along with research methodologies and various concept of Genetics and it's importance in human health.</p> <p>PO5:- Understand the environmental conservation and it's importance, pollution control, biodiversity and protection of endangered species.</p> <p>PO6:- Understand the Agro based Small Scale Industries like Sericulture, Fish firming and apiculture and medicine</p> <p>PO7:- Understand the speaking and writing knowledge in English, digital method of finding experimental work, computer skills, health care, etc.</p> <p>PO8:-Understand the regional environment and geological concepts regarding the evolutionary trends of the animals.</p>
Programme Specific Outcome	<p>PSO1:-Understand the nature and basic concepts of cell biology, genetics, taxonomy, physiology, pathology, ecology, evolution and applied Zoology,</p> <p>PSO2:- Develops the empathy and love towards the animals and analyse the relationships among animals, plants and microbes.</p>

	<p>PSO3:- Understand the procedures as per laboratory standards in all the different fields of zoology and applications of biological sciences in apiculture, aquaculture, agriculture, and medicine.</p> <p>PSO4:- Understand the principles and commitment to professional ethics and responsibilities in delivering duties.</p> <p>PSO5:-Gains knowledge about research methodologies, effective communication and skills of problem solving methods, contributes the knowledge for Nation Building.</p>
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Course Outcome

Course		Course Outcome
<u>COURSE CODE :- ZOO- 101</u>		
CO1:	Understanding the historical account of species, species concept & classification of animals up to species . taxonomy, systematic & taxonomic hierarchy of animals.	
CO2:	Understanding the, International Code of Zoological Nomenclature. concepts of chemotaxonomy, numerical, morphometric, cytological & molecular techniques in taxonomy.	
CO3:	Understanding the zoogeographical regions of the world with characteristic fauna, marine realm and its division. Barriers , types & significance of barriers, continental drift & discontinuous distribution.	
CO4:	Understanding the fossils & fossilization, types, trace, living, dating & significance of fossils. geological time scale & associated fauna.	
CO5:	Practical skills of collection of species, recording, and description of characters and Colours in fresh.	
CO6:	Practical skills of labelling, tagging and maintenance of Field Record Book, identification of species using dichotomous keys. data sheets, data entry	
CO7:	Practical skills of Narcotization, Fixation, Preservation techniques(wet and dry wt.),slide preparation.	
CO8:	practical skills of using Camera Lucida for drawing speciesand description of species.	
<u>ZOO:-202</u>		
CO1:	Understanding the distinguishing characters and classification of phylum protozoa to echinodermata with their structure, reproduction, life history and affinities.	

CO2:	Understanding the parasitic adaptation, and pathogenicity of protozoa , platyhelminthes, nemathelminthes.
CO3:	Understanding the distinguishing characters and examples of minor phyla
CO4:	Understanding the origin , metamerism and symmetry of metazoan, Canal system, skeleton and economic importance of sponges
CO5:	Practical skills of dissections of digestive, nervous, excretory and reproductive systems of Cockroach, Nereis and Pila.
CO6:	Practical skills of studying permanent slides, study of museum specimens.
CO7:	Practical skills in the preparation and mounting of temporary slides.

ZOO:-303

CO1:	Understanding the general characters and classification of chordata up to orders, structural organisation of Hemichordata, Urochordata and cephalochordata, and affinities of amphioxus.
CO2:	Understanding Agnatha and pisces, structure, digestive, respiratory circulatory, reproductive systems of Petromyzon, Scoliodon and lung fishes, origin of fishes.
CO3:	Understanding the origin , evolution , classification up to living orders of amphibia and reptiles, distinction between poisonous and non poisonous snakes, biting mechanism of snakes
CO4:	Understanding the origin , distinctive characters and classification up to living orders of Mammalian and Aves, digestive, respiratory, circulatory, urino- genital and skeletal systems of pigeon, perching mechanism of birds, dentition and placentation of mammals
CO5:	Understanding the comparative anatomy regarding integumentary, digestive, circulatory, skeletal, nervous, and endocrine systems of chordates
CO6:	Practical skills of anatomical systems of Scoliodon, Frog, and Calotes.
CO7:	Practical skills for the study of Museum specimens.
CO 8:	Practical skills for the study of bones of Frog, Calotes, Pigeon, and Rabbit.

ZOO:-404

CO1:	Understanding the concept of biodiversity and its conservation, Sanctuaries and National parks of India, Concept of wild life conservation, Methods of wild life census.
CO2:	Imparts knowledge to the student regarding environment and conservation biology, biotic and abiotic factors, food chain and energy flow, biosphere and biome , ecosystem , types of ecosystems, ecological succession, Biological cycles.
CO3:	Understanding the concept of population and its components, concept of environmental pollution and Biomagnification .

CO4:	Imparts knowledge to the students regarding the basic foundation of apiculture, Sericulture and Fisheries
CO:5	Understanding the basic concept of computer, operating systems computer application in Biological sciences, Bioinformatics, E-learning, networking programmes used in biostatistics. etc,
CO6:	Practical skills of the Pond ecosystem, Estimation of Oxygen and Carbon dioxide and Population study by tagging, marking , releasing and recapturing method.
CO7:	Practical skills for the study of life history stages of Honey bee, a Silk moth and a fish
CO:8	Visit to Wildlife Sanctuary or National Park/Zoological Garden and study of the available animals.
<u>ZOO:-505</u>	
CO1 :-	Understanding the structural and functional aspects of basic unit of life i. e, Cell concepts cell membranes, cell adhesion and interaction ,concept of unit membrane.
CO2:-	Understanding the Cell organelles, cell cycle, cell division, nuclear organization, molecular expression of gene action: protein synthesis and its regulation.
CO3 :-	Understanding the History of genetics, Mendelian and non Mendelian Inheritance, Quantitative inheritance. linkage maps.
CO4 :-	Understanding the Gene interactions , gene mutation, modern concept of gene, structure and functions, concept of genetic disorders,
CO5 :-	Understanding the Human genetics, genetics of blood group ,genetic counselling. molecular genetics and tools. human genome project.
<u>ZOO :- 506</u>	
CO1 :-	Understanding the origin of life ,Evidences of evolution, Modern concept of organic evolution, Hardy-Weinberg law, Sewall-Wright Effect, Natural selection ,speciation, Isolation mechanism and Evolution of man.
CO2:-	Understanding the mode of adaptation of animals to different habitats, colouration, mimicry, adaptive radiation and convergence
CO3;-	Imparts knowledge to the students about the description and types of behaviour, courtship behaviour of fishes and birds, types of communication in insects, pheromones and their roles, parental care in fishes, migration in insects, fishes, and biological rhythm.
CO4:-	Introduction, history, scope, and importance and types of biotechnology, importance of viruses bacteria, algae and fungi in biotechnology,

CO5:-	Understanding the techniques in animal cell cultures, alcohol fermentation, bio-insecticide, idea of health care and insulin, genetic engineering and Transgenic animals.
CO6:-	Understanding the general principles and brief ideas on the types of Microscopy, Spectrophotometry, Electrophoresis, Chromatography and Centrifugation.
<u>ZOO:- 507 (practical)</u>	
CO1:-	Practical skills in the squash preparation of onion root tip, grasshopper testis, salivary gland chromosomes of drosophila and chironomus for the study of mitosis, meiosis and chromosomes respectively.
CO2:-	Demonstration of Sex chromatin and mitochondria by staining method, karyotyping of chromosomes.
CO3:-	Practical skills for study mimicry of insects , and adaptation of animals, patterns of migration nesting behaviour and parental care of animals.
CO4:-	Demonstration of alcohol fermentation, soya bean fermentation, making curd using starter culture.
CO5:-	Practical skills for the preparation of standard curve of amino acid and protein, measurement of cell using micrometer.
CO6 :-	Demonstration of oil emulsion technique in microscopy, electrophoresis-paper/gel, Separation of tissue extract using centrifuge.
<u>ZOO:-608.</u>	
CO1:-	Understanding the nutritional requirements, digestion and absorption, origin, conduction and regulation of heart beat, cardiac cycle and electrocardiogram
CO2:-	Understanding the composition and function of blood, blood group and Rh factor, blood pressure, blood coagulation, haemoglobin and haemopoiesis.
CO3:-	Understanding the mechanism and control of breathing, transport of oxygen and carbon dioxide, oxygen dissociation curves of haemoglobin, Bohr effect, Haldane effect, Chloride Shift.
CO4 :-	Understanding the physiology of urine formation, mechanism of micturition, role of kidney in water regulation, salt and acid – base balance.
CO5:-	Understanding the ultra structural, chemical, and physiological basis of skeletal muscles, muscles contraction and mechanism of muscle contraction and Cori's cycle.
CO6:-	Understanding the nature, origin and propagation of nerve impulses and synapse,

	Integrative function of central nervous system , sense organs, and Electroencephalogram.
CO7:-	Understanding the endocrine glands, functions and hormones secreted by endocrine glands, Hormones secreted by gastrointestinal system , kidney, placenta, and heart and their functions
CO8:-	Concepts of immunology, innate and acquired immunity, structure and types of Ig, antigen antibodies reaction, mechanism of immune responses, brief idea of HIV and AIDS
<u>ZOO:-609</u>	
CO1:-	Understanding the gametogenesis, fertilization and parthenogenesis, animal egg, early stages of development, foetal membranes.
CO2:-	Understanding the Organogenesis, tissue interactions and metamorphosis.
CO3:-	Understanding the basic principles of histological techniques. microscopic anatomy of the following organs of a mammal.
CO4:-	Understanding the Biological chemistry, its scope and importance. chemistry of carbohydrates, proteins and lipids, nucleic acids. Classification and functions of enzymes
CO5:-	Understanding the metabolism of carbohydrates, biological oxidation, concept of Bioenergetics, lipid metabolism, protein metabolism and interrelationship of metabolic pathways.
<u>ZOO:- 610 (Practical)</u>	
CO1:-	Practical skills on the effects on isotonic, hypertonic, hypotonic solutions in erythrocytes. Uses of Haemocytometer for counting of blood, estimation of haemoglobin percentage, preparation of haemin crystals.
CO2:-	Coagulation of blood, heart beat recording of Frog, demonstration of the effects of acetylcholine, atropine and epinephrine on the heart beat.
CO3:-	Practical skills on dissection of endocrine gland in rat, study of permanent slides of endocrine glands, determination of ABO and R h factor of blood.
CO4:-	Study of developmental stages of chick and frog from the permanent slides. study of histology of different organs from permanent slides
CO5:-	Microtome- fixation, block making, sectioning, staining, and mounting of tissues .
CO6:-	General test for carbohydrates, proteins, and lipids. Separation of amino acid using paper chromatography. colorimetric estimation of protein from a calibration curve.

B.A/B.SC GEOGRAPHY COURSE:

Programme Outcome	<ul style="list-style-type: none"> • Development of knowledge, skills and holistic understanding of the discipline among students. Encouragement of scientific mode of thinking and scientific method of enquiry in students understand the lithosphere, hydrosphere and atmosphere deeper. • Students become equipped with the ability to respond to both socio-economic survey and land survey like measurement of area, road profile drainage profile, statistical calculation after completion the course, being students of Geography-ability to undertake research in interdisciplinary studies and problems or issues beyond the realm of what strictly comes under the preview of the subject and employee ability • Acquire communication knowledge from English, environmental studies, • This is possible because of the varied nature of the curriculum that encompasses the dynamic studies and analysis of sub-disciplines and allied discipline of landforms, surveying knowledge.
Course Code	Course outcome
GG-101 1 st Year	<ul style="list-style-type: none"> • Explaining the contribution of geographical thought, knowledge of man and environment relationships, ecology, Remote sensing, GIS and field works of the selected areas.
GG-102	<ul style="list-style-type: none"> • Understanding the brief ideas of solar system, origin of the earth, planets, earthquakes, landforms, weathering, cycle of erosion; earth's atmosphere climate, configuration of ocean floor and about ecosystem
GG-103(i) 2 nd Year	<ul style="list-style-type: none"> • Studying the life style of primitive stage of mankind and migration to different places of the world and their economic activities.
GG-103(ii) (Practical)	<ul style="list-style-type: none"> • Introducing the use of scales, identification of rocks, representation of topographical structures, drawing of profiles, interpretation of weather report, hythergraph, and climograph
GG-104 (i)	<ul style="list-style-type: none"> • Discussing the fundamentals of habitable parts of the world and different global population dynamics, migration and their problems; types and patterns of settlement, urbanization trends and functional classification of towns
GG-104 (ii) (Practical)	<ul style="list-style-type: none"> • Description of cartographic symbols their uses, representation of dots, circles and pictorial by means of given data; statistic calculations and representations of data by cartographic techniques, interpretation of toposheet maps
GG:505 (Hons) 3 rd Year	<ul style="list-style-type: none"> • To explaining the fundamentals of geomorphology. • Explaining the physical, cultural and a land of unity in diversity; highlighting the agriculture, transport, trade and industrial structure of India; the regional planning divisions of India specifically NE India and Manipur • Preparation of cross and longitudinal profiles of streams, analysing the average slope map, block diagram, area height curve, hypsometric curve and drainage pattern through cartograms; drawing of geological map and interpretation the profile; basic principles of land surveying using chain and tape, prismatic, map projections
GG: 506	
GG: 507(Practical)	
GG:608 (Theory)	<ul style="list-style-type: none"> • Understanding the fundamental principles of Economic Geography • Describing the Renewable and non- renewable resources of the world; the locational factors for development of industries; understanding the industrial development of India and impact of globalisation and India's Economy; Regional studies of south east Asia and given more emphasis to the continents of -Europe, Africa, America and Australia
GG:609 (Theory)	
GG:610 (Practical)	
	<ul style="list-style-type: none"> • Practically field works surveying of road profile, contouring, theodolite for measurement of heights and distances; interpreting remotely sensed satellite images and aerial photographs in order to understand topographical and cultural variations on the earth's surface

Programme Specific Outcome	<p><u>Students will try to learn:</u></p> <p>The views of philosophers and their contributions of geographical thought; establishing man environment relationships; understanding the origin of the earth, landforms, configuration of climate, and its effect. Imbibing to explain basic knowledge of physical, human, population geography and inculcating the knowledge of handling remote sensing, GPS and GIS. Students understand the mode of life of humankind and their economic structure, developing a sensitive and approach towards resource mobilisation for sustainable development; world population, types of settlements and concepts of growth of urban and urbanization in the world. Understanding the conventional signs, weather maps; representation of data by pictorial forms means of graph, lines, choropleth and techniques of statistical application, surveying, mapping with projection</p>
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ECONOMICS DEPARTMENT:

Programme Outcome	
PROGRAMME SPECIFIC OUTCOME	
	On completion of the Economics (Hons) Course, a student will acquire the contents of the subject. In addition to acquiring the contents of the subject, he/she will be able to practice critical thinking skills, communication skills, quantitative reasoning and economic citizenry. All these skills will enhance his/her chance of getting jobs.
Course outcome	
B.A 1st Sem	<p>A student will understand the following concepts of the Indian Economy at the end of the 1st Semester:</p> <ol style="list-style-type: none"> The basic nature and the features of the Indian Economy; The different natural resources available in the economy and their relationships with the development of the economy. The population issues related with the economic development; Issues related with the Agricultural development since independence; Issues, problems, growth, pattern and reforms of industrialisation; and Planning and development issues with respect to foreign trade, unemployment and poverty and economic reforms programmes.
B.A 2nd Sem	<p>The student will understand the different concepts related with Microeconomics such as:</p> <ol style="list-style-type: none"> The themes of microeconomics; The different theories of demand; Theories of production; Market forms specially ,the Perfect Competition and monopoly; and Models of price discrimination.
B.A 3rd Sem	<p>The student will have the knowledge of :</p> <ol style="list-style-type: none"> Factor markets with different powers such as monopsony, monopoly etc; General equilibrium and its properties as well as allocation of resources, issues associated with general equilibrium; The different criteria of social welfare;

	<p>iv) Externalities and its different forms as well as associated problems; and</p> <p>v) Markets with asymmetric information.</p>
B.A 4th Sem	<p>The learner will conversant with the following concepts of Macroeconomics:</p> <p>a) The different theories of Income and employment such as classical and Keynesian theories;</p> <p>b) The neo-classical synthesis and associated issues;</p> <p>c) The different theories of Inflation. Money supply and its measures and components; and</p> <p>d) Growth models.</p>
B.A 5th Sem	<p>At the end of the 5th semester, a student will have the basic knowledge of the following terms of economics:</p> <p>a) The different concepts of public finance such as nature and scope, techniques of budgeting, principles of taxation, theories of public expenditure as well as effects of public expenditure, sources and role of public borrowings, nature of fiscal federalism in India and constitutional provisions;</p> <p>b) The different concepts of political economy, evolution of society, state and economy, characteristics of capitalism, global capitalist systems and political economy of Indian economic development; and</p> <p>c) Importance of mathematics and statistics in economics, the different tools and techniques of mathematics and statistics used in economics.</p>
B.A 6th Sem	<p>At the end of the sixth semester, a student will learn the issues, problems and concepts of Development Economics, Environmental Economics and International Economics such as:</p> <p>a) Growth and Development, theories of growth, strategies of development, policy issues of development, technology transfer and trade policy, role of the market and state in the planning process ;</p> <p>b) Environmental economics and its issues, environmental problems and solutions, market failure with environmental consequences, renewable and non-renewable resources and economics of sustainable development ; and</p> <p>c) Nature and significance of international trade and different theories of trade, trade policies, balance of payments and role of international agencies/organisations such as IMF, GATT, WTO etc.</p>