



# **SREE NARAYANA COLLEGE CHERTHALA**

## **COURSE OUTCOMES**

# COURSE OUTCOMES

DEPARTMENT OF BOTANY			
B.Sc. BOTANY			
SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	BO114 1	ANGIOSPERM ANATOMY REPRODUCTIVE BOTANY & PALYNOLOGY	<p>CO1: Students are able to understand the complexities of cell wall organization, microscopic and sub microscopic structures.</p> <p>CO2: Students can distinguish various anatomical features of monocots and dicots (stem and root) with respect to permanent tissues and tissue systems.</p> <p>CO3: Identify and differentiate male and female gametophyte development in angiosperms.</p> <p>CO4: Distinguish monocot and dicot embryo and the basic features of pollen grains.</p>
2	BO122 1	METHODOLOGY AND PERSPECTIVES IN PLANT SCIENCE	<p>CO1. Students will be familiarized with the fundamental characteristics of Science.</p> <p>CO2: Develops an idea about involvement of science in improvement of human life.</p> <p>CO3: Create awareness of scientific approach towards life and learns the values of ethics in science.</p> <p>CO4: Develops skills to interpret scientific data using basic statistical methods.</p> <p>CO5: Create skills to prepare specimens for microscopic and gross anatomical studies and familiarize with different microscopic methods for sample analysis.</p> <p>CO6: Students become able to prepare buffers, measure pH, and separate plant pigments and construct absorption spectrum of a sample.</p>

3	BO134 1	MICROBIOLOGY, PHYCOLOGY, MYCOLOGY, LICHENOLOGY AND PLANT PATHOLOGY	CO1: The student can prepare micro preparations and identify the thallus and reproductive structures of lower plant groups like algae, fungi and lichen.
			CO2: Awareness created among students about various microbes, structure and economic importance.
			CO3: Students can use effectively the methodology to isolate and identify bacteria present in curd and root nodules.
			CO4: Can identify various plant diseases, etiology of pathogens and control measures.
			CO5: Able to prepare fungicides like tobacco decoction and Bordeaux mixture.
4	BO144 1	BRYOLOGY, PTERIDOLOGY, GYMNOSPERMS AND PALEOBOTANY	CO1: Students are able to make micropreparations of thallus and reproductive structures of as well as better understanding of the life cycle of selected members of Bryophytes, Pteridophytes and Gymnosperms.
			CO2: Can understand the economic and ecologic importance of lower groups of plant kingdom.
			CO3: Better understanding of fossilization and importance of Palaeobotany.
			CO4: Identify various parts of fossil plants through micro slides.
5	BO155 1.2	OPEN COURSE 1(B) - MUSHROOM CULTIVATION AND MARKETING	CO1: Identify mushrooms, structure and mode of propagation.
			CO2: Understand commercial mushroom cultivation, marketing and their nutritional value.
	BO154 1	ANGIOSPERM	CO1: Ability to identify different types of inflorescences, flowers and fruits, their arrangement and relative position.

6		MORPHOLOGY, SYSTEMATIC BOTANY, ECONOMIC BOTANY, ETHNOBOTANY AND PHARMACOGNOSY	CO2: Familiarization of basic rules of Angiosperm classification and different types of classification.
			CO3: Preparation and maintenance of Herbarium.
			CO4: Identification of plants to their respective families.
			CO5: Understanding of ethnobotanical and pharmacological significance of plants.
	BO154 2	ENVIRONMENTAL STUDIES AND PHYTOGEOGRAPHY	CO1: Helps to develop awareness about natural resources, its conservation and importance of sustainable lifestyles. Understands and identify different ecosystems and ecosystem processes.
			CO2: Develops deep understanding about biodiversity and importance of its conservation.
			CO3: Develops skills to identify polluted sites, its major pollutants and recognize the need to mitigate environmental pollution.
			CO4: Awareness about different types of disasters and to adopt strategies to overcome and reduce the impact.
			CO5: Identify the importance of phytogeographical sites in India.
	BO154 3	CELL BIOLOGY, GENETICS AND EVOLUTIONARY BIOLOGY	CO1: Students have a better understanding of cell structure and cell organelles.
CO2: Students Can prepare microslides of cell divisions and identify various stages of mitosis and meiosis.			
CO3: Students are able to work out problems in classical genetics, modified mendelian ratios and population genetics.			
CO4: Students are able to understand genetic diseases and their inheritance and Understand evolutionary principles, theories and methods of speciation.			
6	BO164	PLANT	CO1: Students get a clear understanding of the basic concepts of

	1	PHYSIOLOGY AND BIOCHEMISTRY	Physiology and Biochemistry.
			CO2: Understands photosynthesis, respiration, plant growth regulators, nitrogen metabolism and stress physiology.
			CO3: Familiarization of basic physiological practical procedures.
			CO4: Students get the basic knowledge about the macromolecules and their overall role in cell metabolism; and secondary plant products.
			CO5: Identification of protein, reducing and non-reducing sugar by qualitative tests.
	BO164 2	MOLECULAR BIOLOGY, GENERAL INFORMATICS AND BIOINFORMATICS	CO1: Helps to Understand DNA as genetic material, develop awareness about chemical composition and different types of DNA including their replication method.
			CO2: Students understand various molecular aspects of gene expression and regulation of genes.
			CO3: Develops awareness about various academic services applied for their studies and Awareness about features of a computer, different application and system software.
			CO4: Students are able to recognize the need for safe use of internet and also become aware about health issues related to over usage of computers and mobile phones as well as cyber-crimes and cyber laws.
			CO5: Students will be familiarized to molecular phylogeny, Biological Databases, Sequence analysis, Genomics, Proteomics & Comparative genomics.
	BO 1643	HORTICULTURE PLANT BREEDING AND RESEARCH METHODOLOGY	CO1: Students able to identify and use various horticultural implements and Can propagate plants through grafting, budding and layering & can prepare manures, fungicides etc.
			CO2: Students Can effectively do plant breeding methods and understands the practical application in betterment of food crops.
CO3: Students are able to devise an experimental design and carry			

		LOGY	out a project.
			CO4: Students trained about various steps for the conduct of a research project and write a project report.
	BO165 1	ELECTIVE- BIOTECHN OLOGY AND NANOBIOT ECHNOLOG Y	CO1: Students are familiarized in preparation of culture solutions, sterilization, inoculation of explants, induction of callus and morphogenesis.
			CO2: They are familiarized in biotechnological tools like RFLP, RAPD and PCR techniques.
			CO3: Use of equipment and tools in biotechnology.
			CO4: Understanding of ethical and legal issues in biotechnology and basic knowledge about IPR.
CO5: Better understanding of nanosystems, biosensors and application of nanotechnology in biological system.			

<b>M.Sc. BOTANY</b>			
SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	BO211	PHYCOLOGY , MYCOLOGY, MICROBIOLOGY & PLANT PATHOLOGY	CO1: To familiarize the students the habitats ,classification, structure ,life cycle and evolutionary trends of Algae and Fungi
			CO2: To get a basic idea about the ecological significance of Algae, Fungi and Lichen.
			CO3: To introduce the students about the aspects of Microbiology like classification, structure, metabolism, Bacterial culture and microbial diseases.
			CO4: To understand the role microbes in Agricultural, Environmental and industrial applications
			CO5: To get the knowledge on various plant diseases caused by different types of pathogens.

	BO212	BRYOPHYTA , PTERIDOPHYTA AND GYMNOSPERMS	CO1: To impart basic knowledge about geographical distribution , classification ,structure ,life history and phylogeny of Bryophytes, Pteridophytes and gymnosperms.	
			CO2: To give an idea about their ecological role and economically important products obtained from them and their uses.	
			CO3: To familiarize the fossil members of these groups.	
	BO213	HISTOLOGY, REPRODUCTIVE BIOLOGY, MICROTECHNIQUE AND HISTOCHEMISTRY	CO1: To understand the anatomical features of plant parts and to identify the anomalous growth.	
			CO2: To correlate the anatomical features to taxonomy.	
			CO3: To acquire knowledge on plant reproduction and development.	
			CO4: To familiarize the techniques for the preservation and processing of tissues.	
			CO5: To get practical experience in microtechnique and histochemistry.	
	2	BO 221	TAXONOMY OF ANGIOSPERMS, ECONOMIC BOTANY AND ETHNOBOTANY	CO1: To understand the concepts and principles related to Plant taxonomy, Ethnobotany and Economic botany.
				CO2: To acquire the skill in plant identification and herbaria preparation.
CO3: To create an attitude in conserving plants for sustainable development.				
BO222		BIOLOGY, FOREST BOTANY, PHYTOGEOGRAPHY AND CONSERVATION	CO1: To learn the concepts on ecosystem and environment.	
			CO2: To impart knowledge on phytogeography and distribution.	
			CO3: To understand the concept, aim and principles of conservation.	
	CO4: To understand the causes and effects of pollution and			

		BIOLOGY	climate change.
			CO5: To create awareness about the significance of genetic resources and its conservation.
	BO223	CELL BIOLOGY, GENETICS AND EVOLUTION	CO1: To learn the concepts on cell organelles, cell cycle, cell differentiation and interactions.
			CO2: To acquire practical skill in cytological preparations.
			CO3: To get knowledge about Mendel's Experimental approach.
			CO4: To understand concepts on linkage, microbial genetics and biochemical genetics.
CO5: To impart knowledge on molecular genetics and protein synthesis.			
		CO6: To understand mechanism of evolution.	
3	BO164 1	PLANT PHYSIOLOGY AND BIOCHEMISTRY	CO1: Students get a clear understanding of the basic concepts of Physiology and Biochemistry.
			CO2: Understands photosynthesis, respiration, plant growth regulators, nitrogen metabolism and stress physiology.
			CO3: Familiarization of basic physiological practical procedures.
			CO4: Students get the basic knowledge about the macromolecules and their overall role in cell metabolism; and secondary plant products.
			CO5: Identification of protein, reducing and non reducing sugar by qualitative tests.
	BO 231	PLANT BREEDING, HORTICULTURE AND BIOSTATISTICS	CO1: To provide basic knowledge in plant breeding, biostatistics and horticulture.
			CO2: To understand different breeding methods used in crop breeding.
			CO3: To develop practical skills in plant breeding.



			CO4: To apply the statistical methods for data analysis.
	BO232	BIOCHEMISTRY, PLANT PHYSIOLOGY AND RESEARCH METHODOLOGY	CO1: To understand the biochemistry of plant developments
			CO2: To trace the relationship between biochemical pathways in plants and the physiological processes.
			CO3: To introduce the basic concepts in research methodology.
			CO4: To prepare the students to draft a project proposal.
	BO 233	MOLECULAR BIOLOGY, IMMUNOLOGY AND PLANT BIOTECHNOLOGY	CO1: To get an overview on Molecular Biology and Immunology.
			CO2: To impart knowledge about various techniques in Molecular Biology.
			CO3: To bestow practical skill in isolation of DNA, RNA and Protein.
CO4: To acquire an in depth knowledge on plant biotechnology and its application.			
4	BO 242	SPECIAL PAPER –II ELECTIVE BIOTECHNOLOGY	CO1: To make awareness about the fundamentals of Biotechnology.
			CO2: To impart knowledge on Microbial genetics with respect to bacterial gene expression, regulation and gene manipulation.
			CO3: To familiarise the students with the tools and techniques of genetic engineering and gene transfer technologies.
			CO4: To understand the techniques and applications of plant tissue culture.
			CO5: To acquire basic practical skills in Biotechnology.

## COMPLEMENTARY COURSES

SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	BO 1131	MICROTECHNIQUE, ANGIOSPERM ANATOMY AND REPRODUCTIVE BOTANY	CO1: Students are able to understand the techniques for micro preparations.
			CO2: Students can distinguish various anatomical features of monocots and dicots (stem and root) with respect to permanent tissues and tissue systems.
			CO3: Identify and differentiate male and female gametophyte development in angiosperms.
			CO4: Distinguish monocot and dicot embryo and the basic features of pollen grains.
2	BO123 1	PHYCOLOGY, MYCOLOGY, LICHENOLOGY, BRYOLOGY, PTERIDODOLOGY, GYMNOSPERMS AND PLANT PATHOLOGY	CO1: The student can prepare micro preparations and identify the thallus and reproductive structures of lower plant groups like algae, fungi and lichen.
			CO2: Students are able to make micropreparations of thallus and reproductive structures of as well as better understanding of the life cycle of selected members of Bryophytes, Pteridophytes and Gymnosperms.
			CO3: Can understand the economic and ecologic importance of lower groups of plant kingdom.
3	BO133 1	SYSTEMATIC BOTANY, ECONOMIC BOTANY, ETHNOBOTANY AND PLANT BREEDING COURSE OUTCOME	CO1: Ability to identify different types of inflorescences, flowers and fruits, their arrangement and relative position.
			CO2: Familiarization of basic rules of Angiosperm classification and different types of classification.
			CO3: Ability to Identify plants to their respective families.
			CO4: Understanding of ethnobotanical and pharmacological significance of plants.
			CO5: Students can effectively do plant breeding methods and understands their practical.
		PLANT PHYSIOLOGY, ECOLOGY, PLANT BIOTECHNO	CO1: Students get a clear understanding of the basic concepts of Physiology.
			CO2: Understands photosynthesis, respiration, plant growth regulators, nitrogen metabolism and stress physiology.
			CO3: Familiarization of basic physiological practical procedures.

4	BO143	LOGY AND HORTICULTURE	CO4: Students able to identify and use various horticultural implements.
			CO5: Can propagate plants through grafting, budding and layering & can prepare manures, fungicides etc.
			CO6: Students are familiarized in preparation of culture solutions, sterilization, inoculation of explants, induction of callus and morphogenesis.

DEPARTMENT OF COMMERCE			
B.COM			
SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	CO 1121	METHODOLOGY AND PERSPECTIVES OF BUSINESS EDUCATION	CO1: Create a basic awareness about the business environment and the role of business in economic development.
			CO2: Provide a holistic, comprehensive and integrated perspective to business education
			CO3: Give a fundamental understanding about ethical practices in business.
	CO 1141	ENVIRONMENTAL STUDIES	CO1: Enable the students to acquire basic ideas about environment and emerging issues about environmental problems.
			CO2: Give awareness about the need and importance of environmental protection
	CO 1142	MANAGEMENT CONCEPTS AND THOUGHTS	CO1: Equip learners with knowledge of management concepts and their application in contemporary organizations
CO2: Facilitate overall understanding of the different dimensions of the management process.			
CO 1131	MANAGERIAL ECONOMICS	CO1: Familiarise students with the economic principles and theories underlying various business decisions	
		CO2: Equip the students to apply the economic theories in different business situations.	
	CO 1221	INFORMATICS AND CYBER LAWS	CO1: Review the basic concepts and fundamental knowledge in the field of informatics and to create an awareness about the nature of the emerging digital knowledge society and the impact of informatics on business decisions.

2			CO 2: Create awareness about the cyber world and cyber regulations.
	CO 1241	FINANCIAL ACCOUNTING	CO1: Familiarize the students with different methods of depreciation.
			CO2: Equip the students to prepare the accounts of specialised business enterprises.
	CO 1242	BUSINESS REGULATORY FRAMEWORK	CO1: Provide a brief idea about the framework of Indian business Laws.
			CO2: Enable the students to apply the provisions of business laws in business activities.
	CO 1231	BUSINESS MATHEMATICS	CO1: Familiarise the students with the basic mathematical tools.
CO2: Impart skills in applying mathematical tools in business practice.			
CO 1341	ENTREPRENEURSHIP DEVELOPMENT	CO1: Familiarize the students with the latest programmes of Government in promoting small and medium industries.	
		CO2: Impart knowledge regarding starting of new ventures.	
3	CO 1342	ADVANCED FINANCIAL ACCOUNTING	CO1: To create awareness of accounts related to dissolution of partnership firms.
			CO2: To acquaint students with the system of accounting for different branches and departments.
			CO3: To enable students to prepare accounts of consignments.
	CO 1343	COMPANY ADMINISTRATION	CO1: Familiarize the students about the salient provisions of Indian Companies Act 2013.
			CO2: Acquaint the students with Management and Administration of Companies, Compliance requirements, investigation into the affairs of the company and Winding up procedure.
	CO 1361	COMPUTER APPLICATIONS FOR PUBLICATIONS	CO1: Give functional knowledge in the field of free software.
			CO2: Develop practical skills in document preparation, publishing and business presentation.
	CO 1331	E BUSINESS	CO1: To provide students a clear-cut idea of e-commerce and e-business and their types and models.
			CO2: To acquaint students with some innovative e-business systems.
			CO3: To impart knowledge on the basics of starting online business.

4	CO 1441	INDIAN FINANCIAL MARKET	CO1: Provide a clear-cut idea about the functioning of Indian Financial Market in general and Capital market operations in particular.
	CO 1442	BANKING AND INSURANCE	CO1: Provide a basic knowledge about the theory and practice of banking.
			CO 2: Provide a basic understanding of Insurance business.
			CO 3: Familiarize the students with the changing scenario of Indian Banking and Insurance.
	CO 1443	CORPORATE ACCOUNTING	CO1: Create awareness about corporate accounting in conformity with the provisions of Companies Act, IAS and IFRS.
			CO 2: Help the students in preparation of accounts of banking and insurance companies.
			CO 3: Enable the students to prepare and interpret financial statements of joint stock companies.
	CO 1461	SOFTWARE FOR DATA MANAGEMENT	CO 1: Familiarise the students with the basics of Software for data management.
			CO 2: Equip the students to meet the demands of the industry.
			CO 3: Develop practical skills in spread sheet application, statistical software and database application.
CO 1341	BUSINESS STATISTICS	CO1: Enable the students to gain understanding of statistical techniques those are applicable to business.	
		CO 2: Enable the students to apply statistical techniques in business.	
5	CO 1541	FUNDAMENTALS OF INCOME TAX	CO1: Familiarize the students about the fundamental concepts of Income Tax.
			CO2: Enable the students to acquire the basic skills required to compute the tax liability of individual assessee with more emphasis on Income from Salaries and Income from House property.
	CO 1542	COST ACCOUNTING	CO1: Familiarize the students with cost and cost accounting concepts.
			CO2: Make the students learn cost accounting as a distinct stream of accounting.
CO 1543	MARKETING MANAGEMENT	CO1: Provide an understanding of the contemporary marketing process in the emerging business scenario.	
		CO2: Study various aspects of application of modern marketing techniques for obtaining a competitive advantage in business organizations.	
CO 1551	PRINCIPLES OF MANAGEMENT	CO1: Provide knowledge on the fundamentals of management principles and functions.	

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	CO 1561	WEB DESIGNING AND PRODUCTION FOR BUSINESS	CO1: Impart functional knowledge in the field of Web design CO2: Develop practical skills in Web designing and production for business organisations.
6	CO 1641	AUDITING	CO1: Provide students the knowledge of auditing principles, procedures and techniques in accordance with current legal requirements and professional standards. CO2: Familiarize students with the audit of Companies and the liabilities of the auditor.
	CO 1642	APPLIED COSTING	CO 1: To acquaint the students with different methods and techniques of costing. CO2: To enable the students to apply the costing methods and techniques in different types of industries.
	CO 1643	MANAGEMENT ACCOUNTING	CO1: Enable students to acquire sound knowledge of concepts, methods and techniques of management accounting. CO2: Make the students develop competence with management accounting usage in managerial decision making and control.
	CO 1651	MANAGEMENT OF FOREIGN TRADE	CO 1: Acquaint the students with India's foreign trade. CO 2: Familiarise the students with international trade and services.
	CO 1661	COMPUTERISED ACCOUNTING	CO1: Expose the students to computer application in the field of Accounting. CO2: Develop practical skills in the application of Tally Package.

## DEPARTMENT OF CHEMISTRY

### B.Sc. CHEMISTRY

SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	CH 1141	INORGANIC CHEMISTRY I	CO1: Discuss the course of development of structure of atom.
			CO2: Correlate and predict general properties of s and p block elements based on their electronic configuration.
			CO3: Define various concepts of acids and base.
			CO4: Realise various causes, effects and control measures of environmental pollution.
2	CH 1221	CHEMISTRY –ITS ORIGIN, METHODOLOGY AND IMPACT	CO1: Appreciate the development of scientific theories through years with specific examples.
			CO2: Develop curiosity and scientific attitude towards the application of chemistry in daily life.
			CO3: Develop curiosity and scientific attitude towards the application of chemistry in daily life.
			CO4: Get motivated in visiting chemical Industries.
3	CH 1341	INORGANIC CHEMISTRY II	CO1: Understand various theories of chemical bonding and their limitations.
			CO2: Understand chemistry of glass, silicates and silicones interhalogen compounds, noble gases etc.
			CO3: Understand introductory concepts of nanochemistry.
			CO 4: Discuss applications of nuclear chemistry and radioactivity in various fields.
4	CH 1441	ORGANIC CHEMISTRY – I	CO 1: Recall the fundamentals of organic chemistry.
			CO2: Recall the fundamentals of organic chemistry.
			CO3: Recall the fundamentals of organic chemistry.
			CO4: Explain aromaticity, orientation effect and mechanism of aromatic electrophilic substitution.
	CH 1442	Inorganic Qualitative Analysis	CO1: Obey Lab safety instructions; develop qualities of punctuality, regularity and scientific attitude, outlook and scientific temper (GOOD LAB PRACTICES).
			CO2 : Apply the principle of common ion effect and solubility product in the identification and separation of ions

			CO3: Recall the fundamentals of organic chemistry.
5	CH 1541	PHYSICAL CHEMISTRY I	CO1: Identify, compare and explain the properties and behaviour of ideal and real gases.
			CO3: Understand the physical aspects of solids, crystals and liquids.
			CO4: Understand the working of electrochemical cells and electrolytic conductance.
	CH 1542	INORGANIC CHEMISTRY III	CO1: Understand the transition and inner transition elements.
			CO2: Discuss the nomenclature, properties and applications of co-ordination complexes and organometallic compounds.
			CO3: Discuss the role of inorganic ions in biological systems and biochemistry of biomolecules and biochemical processes.
			CO4: Describe various aspects of metallurgy, and instrumental methods of analyses.
	CH 1543	ORGANIC CHEMISTRY II	CO1: Describe the preparation of carboxylic acids hydroxy, carbonyl amino and organo Mg, Li & Zn compounds.
			CO2: Explain the structure of glucose, fructose, sucrose, starch and cellulose.
			CO3: Illustrate the use of organic reagents in synthesis.
	CH 1544	INORGANIC VOLUMETRI C ANALYSIS	CO1: Develop skill in selecting, primary and secondary standards weight calculation of primary standards weighing by electronic balance, making of solutions of definite strength (standard solutions).
			CO2: Perform volumetric titrations under acidimetryalkalimetry, permanganometry, dichrometry, iodimetry, iodometry, cerimetry, argentometry and complexometry.
	CH 1545	PHYSICAL CHEMISTRY EXPERIMEN T	CO1: Develop Scientific outlook and approach in applying principles of physical chemistry in chemical systems/reactions.
			CO2: Use computational methods for plotting graph.
CO3: Acquire Instrumentation skill in using conductometer, potentiometer, refractometer, stalagmometer and Ostwald's viscometer.			
CH 1551.3	ENVIRONM ENTAL CHEMISTRY	CO1: Become aware of environmental issues and its effect to man and other living beings.	
		CO2: Review major environmental disasters and suggest controlling and preventive measures CO3 Discuss the laws of environmental protection.	
CH 1641	PHYSICAL CHEMISTRY	CO1: Understand basic concepts and applications of thermodynamics, spectroscopy and group theory.	



6		II	CO2: Understand the basics of spectroscopic techniques Rotational, Vibrational, Raman, NMR and ESR Spectroscopy. CO3: Identify the elements of symmetry and Determine the point groups of simple molecules. CO4: Illustrate the non-spectroscopic techniques used for structural elucidation.
	CH 1642	ORGANIC CHEMISTRY III	CO1: Understanding the chemistry of heterocyclic compounds, natural products.
			CO2: Explain the types, mechanisms of polymerisation and applications of polymers.
			CO3: Discuss the principle of UV, IR, NMR and Mass spectroscopy for the structural elucidation of organic compounds.
	CH1643	PHYSICAL CHEMISTRY III	CO1: Understand the basic concepts involved in quantum mechanics, colloids, adsorption, Chemical Kinetics, catalysis, chemical and ionic equilibria, phase equilibria, binary liquid systems and photochemistry.
			CO2: Identify and recognize the applications of various principles, equations and physical processes.
CO3: Analyze graphical representations (phase diagrams, two and three components, vapour pressure – composition and boiling point – composition, temperature-composition) present in physical chemistry.			
	CH 1651.4	BIO CHEMISTRY	CO1: Recognise the constituents of blood and blood coagulation factors.
			CO2: Become aware of the role of organs, in maintaining health.
			CO3: Realise applications of Analytical techniques and instruments for biochemical studies.
	CH 1644	ORGANIC CHEMISTRY EXPERIMENTS	CO1: Differentiate and identify organic compounds by their characteristic reactions towards standard reagents.
			CO2: Confirm their findings by preparing solid derivatives, and thus understand reliability of experimental results.
			CO3: Practice systematic scientific procedure and prepare adequate report of them.
CH 1645	GRAVIMETRIC EXPERIMENTS	CO1: Understand precipitation techniques in quantitative context.	
		CO2: Practice technique of making, diluting solutions on quantitative basis.	
		CO3: Take precautionary measures in filtration, drying and incineration of precipitates.	

			CO4: Practice Punctuality and regularity in doing experiments and submitting Lab records.
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### COMPLEMENTARY COURSES

SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
<b>PHYSICS</b>			
1	CH1131.1	THEORETICAL AND ANALYTICAL CHEMISTRY	CO1: Discuss the principle and applications of rotational, vibrational, electronic and NMR spectroscopy.
			CO2: Illustrate isomerism, geometry and bonding in coordination complexes.
			CO3: Appreciate the use of biodegradable polymers.
			CO4: Get insight to the emerging area of nano and advanced materials.
1	CH 1432.1	COURSE V : LAB COURSE FOR PHYSICS	CO1: Develop skill in safe handling of chemicals, take precaution against accidents and follow safety measures.
			CO2: Develop skill in weight calculation for preparing standard solutions.
			CO3: Perform volumetric titrations under acidimetry-alkalimetry, permanganometry, dichrometry, iodimetry iodometry, cerimetry, argentometry and complexometry.
2	CH1231.1	PHYSICAL AND INDUSTRIAL CHEMISTRY	CO1: Apply the principles of physical Chemistry in Catalysis and photochemistry.
			CO2: Draw unit cells and structure of crystals.
			CO3: Understand the effect of temperature on molecular velocities of gases.
			CO4: Discuss on electrochemical cells and emf measurements.
2	CH 1432.1	COURSE V : LAB COURSE FOR PHYSICS	CO1: Develop skill in safe handling of chemicals, take precaution against accidents and follow safety measures.
			CO2: Develop skill in weight calculation for preparing standard solutions.
			CO3: Perform volumetric titrations under acidimetry-alkalimetry, permanganometry, dichrometry, iodimetry iodometry, cerimetry, argentometry and complexometry.
	CH1331.1	PHYSICAL CHEMISTRY	CO1: Apply the principles of physical Chemistry in Catalysis and photochemistry.
			CO2: Draw unit cells and structure of crystals.

3			CO3: Understand the effect of temperature on molecular velocities of gases.
			CO4: Discuss on electrochemical cells and emf measurements.
	CH 1432.1	COURSE V : LAB COURSE FOR PHYSICS	CO1: Develop skill in safe handling of chemicals, take precaution against accidents and follow safety measures.
			CO2: Develop skill in weight calculation for preparing standard solutions.
			CO3: Perform volumetric titrations under acidimetry-alkalimetry, permanganometry, dichrometry, iodimetry iodometry, cerimetry, argentometry and complexometry.
4	CH 1431.1	SPECTROSCOPY AND ADVANCED MATERIALS	CO1: Discuss the principle and applications of rotational, vibrational, electronic and NMR spectroscopy.
			CO2: Illustrate isomerism, geometry and bonding in coordination complexes.
			CO3: Appreciate the use of biodegradable polymers.
			CO4: Get insight to the emerging area of nano and advanced materials.
	CH 1432.1	COURSE V : LAB COURSE FOR PHYSICS	CO1: Develop skill in safe handling of chemicals, take precaution against accidents and follow safety measures
			CO2: Develop skill in weight calculation for preparing standard solutions.
			CO3: Perform volumetric titrations under acidimetry-alkalimetry, permanganometry, dichrometry, iodimetry iodometry, cerimetry, argentometry and complexometry.
<b>GEOLOGY</b>			
1	CH1131.2	THEORETICAL CHEMISTRY	CO1: Associate wave concept with microscopic matter.
			CO2: Understand the relevance of periodic classification of elements.
			CO3: Summarise the applications of radioactivity predict spontaneity of reactions.
			CO4: Relate the analytical principles while doing qualitative and quantitative analyses equilibrium.
	CH 1432.2	COURSE V : LAB COURSE FOR GEOLOGY	CO1: Develop skill in safe handling of chemicals, take precaution against accidents and follow safety measures.
			CO2: Develop skill in weight calculation for preparing standard solutions.
			CO3: Perform volumetric titrations under acidimetry-alkalimetry, permanganometry, dichrometry, iodimetry iodometry, cerimetry, argentometry and complexometry.
			CO4: Determine pH of soil and water samples

2	CH1231.2	PHYSICAL CHEMISTRY	CO1: Apply laws of thermodynamics and relationship of spontaneity with entropy and free energy.
			CO2: Illustrate Le Chatelier's principle and predict the effect of pressure and temperature on reactions.
			CO3: Categorize compounds into acids and bases.
			CO4: Solve numerical problems on pH and thermodynamic properties.
2	CH 1432.2	COURSE V : LAB COURSE FOR GEOLOGY	CO1: Develop skill in safe handling of chemicals, take precaution against accidents and follow safety measures
			CO2: Develop skill in weight calculation for preparing standard solutions.
			CO3: Perform volumetric titrations under acidimetry-alkalimetry, permanganometry, dichrometry, iodimetry iodometry, cerimetry, argentometry and complexometry.
			CO4: Determine pH of soil and water samples.
3	CH1331.2	PHYSICAL AND INORGANIC CHEMISTRY	CO1: Get an insight on crystal structure.
			CO2: Interpret the deviation of real gases from ideal behaviour
			CO3: Differentiate true solution, colloidal solution and suspension.
			CO4: Understand the properties of colloids and their application.
3	CH 1432.2	COURSE V : LAB COURSE FOR GEOLOGY	CO1: Develop skill in safe handling of chemicals, take precaution against accidents and follow safety measures.
			CO2: Develop skill in weight calculation for preparing standard solutions.
			CO3: Perform volumetric titrations under acidimetry-alkalimetry, permanganometry, dichrometry, iodimetry iodometry, cerimetry, argentometry and complexometry.
			CO4: Determine pH of soil and water samples.
4	CH 1431.2	PHYSICAL AND ANALYTICAL CHEMISTRY	CO1: Discuss metallurgy and metallurgical processes.
			CO2: Get and insight in to petro chemical industry.
			CO3: Explain the reaction kinetics.
			CO4: Appreciate the use of sophisticated instruments.
4	CH 1432.2	COURSE V : LAB COURSE FOR GEOLOGY	CO1: Develop skill in safe handling of chemicals, take precaution against accidents and follow safety measures.
			CO2: Develop skill in weight calculation for preparing standard solutions.
			CO3: Perform volumetric titrations under acidimetry-

			alkalimetry, permanganometry, dichrometry, iodimetry iodometry, cerimetry, argentometry and complexometry CO4: Determine pH of soil and water samples.
<b>BOTANY</b>			
1	CH1131.3	ANALYTICAL AND ENVIRONMENTAL CHEMISTRY	CO1: Discuss Bohr atom model and represent electronic configuration of elements.
			CO2: List the various chemical bonds pressure and temperature on reactions.
			CO3: Discuss the theory of volumetric analysis.
	CH 1432.3	COURSE V : LAB COURSE FOR BOTANY	CO1: Develop skill in observation, prediction and interpretation of reactions. CO2: Prepare organic compounds, Purify and recrystallize. CO3: Perform volumetric titrations under acidimetry-alkalimetry, permanganometry, dichrometry, iodimetry iodometry, cerimetry, argentometry and complexometry. CO4: Conduct chromatographic separation of mixtures.
2	CH1231.3	INORGANIC & BIOINORGANIC CHEMISTRY	CO1: Understand the biological and environmental aspects of organic compounds.
			CO2: Summarise the applications of radioactivity.
			CO3: Predict the properties of transition metal complexes.
	CH 1432.3	COURSE V : LAB COURSE FOR BOTANY	CO1: Develop skill in observation, prediction and interpretation of reactions. CO2: Prepare organic compounds, Purify and recrystallize CO3: Perform volumetric titrations under acidimetry-alkalimetry, permanganometry, dichrometry, iodimetry iodometry, cerimetry, argentometry and complexometry. CO4: Conduct chromatographic separation of mixtures.
3	CH1331.3	PHYSICAL CHEMISTRY	CO1: Classify reactions on the basis of order and molecularity.
			CO2: Understand the theories of catalysis.
			CO3: Discuss the principle and application of UV and NMR spectroscopy.
	CH 1432.3	COURSE V : LAB COURSE FOR	CO1: Develop skill in observation, prediction and interpretation of reactions.

		BOTANY	CO2: Prepare organic compounds, Purify and recrystallize. CO3: Perform volumetric titrations under acidimetry-alkalimetry, permanganometry, dichrometry, iodimetry iodometry, cerimetry, argentometry and complexometry. CO4: Conduct chromatographic separation of mixtures.
4	CH1431.3	ORGANIC CHEMISTRY	CO1: Discuss the principle and applications of chromatography and electrophoresis.
			CO2: Categorise crude drugs and explain the method of evaluating crude drugs.
			CO3: Explain the preparation and reactions of amino acids and carbohydrates.
			CO4: Discuss the extraction process and general properties of natural products -oils, fats, terpenes and alkaloids.
	CH 1432.3	COURSE V : LAB COURSE FOR BOTANY	CO1: Develop skill in observation, prediction and interpretation of reactions.
			CO2: Prepare organic compounds, Purify and recrystallize.
			CO3: Perform volumetric titrations under acidimetry-alkalimetry, permanganometry, dichrometry, iodimetry iodometry, cerimetry, argentometry and complexometry.
			CO4: Conduct chromatographic separation of mixtures.
<b>ZOOLOGY</b>			
1	CH1131.4	THEORETICAL CHEMISTRY	CO1: Differentiate particle nature and wave nature of matter.
			CO2: Understand the relevance of periodic classification of elements.
			CO3: Apply the VSEPR theory to explain the geometry of molecules.
		CH 1432.4	COURSE V : LAB COURSE FOR ZOOLOGY
CO2: Prepare organic compounds, Purify and recrystallize.			
CO3: Perform volumetric titrations under acidimetry-alkalimetry, permanganometry, dichrometry, iodimetry iodometry, cerimetry, argentometry and complexometry. CO4: Conduct chromatographic separation of mixtures.			
	CH1231.4	INORGANIC CHEMISTRY	CO1: Understand the biological and environmental aspects of organic compounds.
			CO2: Understand the applications of metal complexes.
			CO3: Summarise the applications of radioactivity

2			CO4: Learn to appreciate biological processes like photosynthesis, respiration etc.
	CH 1432.4	COURSE V : LAB COURSE FOR ZOOLOGY	CO1: Develop skill in observation, prediction and interpretation of reactions.
			CO2: Prepare organic compounds, Purify and recrystallize.
			CO3: Perform volumetric titrations under acidimetry-alkalimetry, permanganometry, dichrometry, iodimetry iodometry, cerimetry, argentometry and complexometry.
CO4: Conduct chromatographic separation of mixtures.			
3	CH1331.4	ORGANIC CHEMISTRY	CO1: Classify carbohydrates, aminoacids, proteins, nucleic acids, lipids, polymers and drugs.
			CO2: Discuss the structure of proteins.
			CO3: Explain the synthesis of amino acids, peptide, drugs
			CO4: Classify carbohydrates, aminoacids, proteins, nucleic acids, lipids, polymers and drugs.
	CH 1432.4	COURSE V : LAB COURSE FOR ZOOLOGY	CO1: Develop skill in observation, prediction and interpretation of reactions.
CO2: Prepare organic compounds, Purify and recrystallize			
CO3: Perform volumetric titrations under acidimetry-alkalimetry, permanganometry, dichrometry, iodimetry iodometry, cerimetry, argentometry and complexometry.			
CO4: Conduct chromatographic separation of mixtures.			
4	CH1431.4	PHYSICAL CHEMISTRY	CO1: Calculate rate and order of reactions.
			CO2: Understand different techniques used for the study of colloids.
			CO3: Review the principles underlying the working of sophisticated instruments.
			CO4: Discuss different concepts of acids and bases.
	CH 1432.4	COURSE V : LAB COURSE FOR ZOOLOGY	CO1: Develop skill in observation, prediction and interpretation of reactions.
CO2: Prepare organic compounds, Purify and recrystallize.			
CO3: Perform volumetric titrations under acidimetry-alkalimetry, permanganometry, dichrometry, iodimetry iodometry, cerimetry, argentometry and complexometry.			
CO4: Conduct chromatographic separation of mixtures.			

## M.Sc. CHEMISTRY

SEME STER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	CHDD 211	INORGANIC CHEMISTRY I	CO1: employ crystal field theory in analysing the splitting of d orbitals in octahedral, tetragonal, square planar, tetrahedral, trigonal bipyramidal and square pyramidal fields, calculate Crystal Field Stabilization Energy and Interpret Octahedral Site Stabilization Energy.
			CO2: critically evaluate data from a variety of analytical chemistry techniques and apply knowledge of the statistical analysis of data.
			CO3: explain the functioning of the frontier materials in inorganic chemistry like Solid Electrolytes, Solid oxide fuel cells, Rechargeable battery materials, Molecular materials and fullerenes.
			CO4: identify the chemical processes occurring naturally in earth's atmospheric, aquatic and soil environments and evaluates the impacts of human perturbations to these processes.
	CHDD 212	ORGANIC CHEMISTRY I	CO1: determine R and S, P and M, E and Z configuration of compounds with chiral centres, biphenyls, allenes, spiranes and draw the configurations in dash and wedge formula, or zig –zag configurations.
			CO2: explain different methods for generation of free radical and different types of free radical reactions- Predict the products in a free radical reaction.
			CO3: differentiate the rate, mechanism and stereochemistry.
			CO4: design the mechanism of selected reactions.
	CHDD 213	PHYSICAL CHEMISTRY I	CO1: outline the development of quantum mechanics and its tools and apply them in determining the wave functions and energies of moving particles.
			CO2: recognize the nature of adsorption and propose theories and choose theoretical and instrumental methods of measurements of surface property.
			CO3: understand theories, mechanism and, kinetics of reactions and solve numerical problems.
			CO4: design the mechanism of selected reactions.
	CHDD 214	INORGANIC CHEMISTRY	CO1: estimate volumetrically the concentration of Zn, Mg and Ni using EDTA and the volumetric estimation of Fe.



2		PRACTICALS – I	CO2: estimate colorimetrically the concentration of Chromium – (using Diphenyl carbazide), Iron (using thioglycolic acid), Iron (using thiocyanate), Manganese (using potassium periodate), Nickel (using dimethyl glyoxime).
			CO3: carry out the preparation of the metal complexes Potassium trioxalatochromate (III), Tetraammoniumcopper (II) sulphate, Hexamminecobalt (III) chloride
			CO4: record the UV spectra, IR spectra, and magnetic susceptibility, TG, DTA and XRD of the complexes prepared.
	CHDD 215	ORGANIC CHEMISTRY PRACTICALS – I	CO1: determine the correct method for separation of a binary mixture and make the separated compounds in pure form
			CO2: develop thin layer chromatogram of a compound and determine its purity.
			CO3: Differentiate the products by spectroscopic methods.
			CO4: use green chemical principles in the synthesis.
	CHDD 216	PHYSICAL CHEMISTRY PRACTICALS – I	CO1: construct the Freundlich and Langmuir isotherms for adsorption of acetic/oxalic acid on active charcoal/ alumina and determine the concentration of acetic/ oxalic acid.
			CO2: determine the rate constant, Arrhenius parameters, rate constant and concentration using kinetics.
			CO3: construct the ternary phase diagram of acetic acid chloroform-water system and out the procedure in an unfamiliar situation to find out the composition of given homogeneous mixture.
			CO4: determine Kf of solid solvent, molar mass of non-volatile solute, mass of solvent and composition of given solution.
	CHDD 221	Inorganic Chemistry-II	CO1: obtain the term symbols of dn system and determine the splitting of terms in weak and strong octahedral and tetrahedral fields.
		CO2: relates crystalline structure to X-ray diffraction data and the reciprocal lattice and explains the diffraction methods.	
		CO3: understands the differences in semiconductor and dielectric materials and their electrical and optical properties.	

		CO4: identify the electronic configurations and term symbols of lanthanides and actinides.
CHDD 222	Organic Chemistry II	CO1: discuss the fundamentals, operating principles and instrumentation of separation techniques.
		CO2: identify different types of rearrangement reactions, determine the product of the reaction applying migratory aptitude, and reproduce the evidences for the mechanism of the reaction.
		CO3: understand that the outcomes of pericyclic reactions may be understood in terms of frontier orbital interactions, correlation diagram, Mobius and Huckel approach
		CO4: state the synthetic importance of the above cycloaddition and rearrangement reactions, and give disconnections of target compounds corresponding to these reactions.
CHDD 223	Physical Chemistry II	CO1: apply quantum mechanical principles in solving both real and imaginary spherical harmonics systems-multi electron systems and analyse spectral lines.
		CO2: predict likely spectral characteristics of given molecular species, and be able to rationalise those characteristics on the basis of structural and electronic arguments.
		CO3: understand theories of electrolytes and electrochemical reactions.
		CO4: acquire knowledge of basics of statistical mechanics and compare statistical methods.
CHDD 214	INORGANIC CHEMISTRY PRACTICALS – I	CO1: estimate volumetrically the concentration of Zn, Mg and Ni using EDTA and the volumetric estimation of Fe.
		CO2: estimate colorimetrically the concentration of Chromium – (using Diphenyl carbazide), Iron (using thioglycollic acid), Iron (using thiocyanate), Manganese (using potassium periodate), Nickel (using dimethyl glyoxime).
		CO3: carry out the preparation of the metal complexes Potassium trioxalatochromate (III), Tetraammoniumcopper (II) sulphate, Hexamminecobalt (III) chloride.
		CO4: record the UV spectra, IR spectra, and magnetic susceptibility, TG, DTA and XRD of the complexes prepared.
CHDD 215	ORGANIC	CO1: determine the correct method for separation of a

		CHEMISTRY PRACTICALS – I	binary mixture and make the separated compounds in pure form
			CO2: develop thin layer chromatogram of a compound and determine its purity.
			CO3: utilize the synthetic procedures and reagents to convert a compound into another. Differentiate the products by spectroscopic methods.
			CO4: use green chemical principles in the synthesis.
	CHDD 216	PHYSICAL CHEMISTRY PRACTICALS – I	CO1: construct the Freundlich and Langmuir isotherms for adsorption of acetic/oxalic acid on active charcoal/ alumina and determine the concentration of acetic/ oxalic acid
			CO2: determine the rate constant, Arrhenius parameters, rate constant and concentration using kinetics.
			CO3: construct the ternary phase diagram of acetic acid chloroform-water system and out the procedure in an unfamiliar situation to find out the composition of given homogeneous mixture.
			CO4: determine Kf of solid solvent, molar mass of non-volatile solute, mass of solvent and composition of given solution.
3	CHDD 231	INORGANIC CHEMISTRY III	CO1: demonstrate knowledge of advanced content in the areas of inorganic chemistry such as in organometallic compounds, bioinorganic compounds, spectroscopic methods in inorganic Chemistry and nuclear chemistry.
			CO2: understand fundamental reaction types and mechanisms in organometallics and to employ them to understand selected catalytic processes in industry.
			CO3: explain the principles of spectroscopic methods employed in inorganic chemistry and their applications in the study of metal complexes.
			CO4: evaluate the role of nuclear chemistry to find the most suitable measures, administrative methods and industrial solutions to ensure sustainable use of the world's nuclear resources.
	CHDD 232	ORGANIC CHEMISTRY III	CO1: describe and explain the physical and chemical principles that underlie molecular structure determination techniques such as UV-visible, IR, mass NMR and mass spectroscopy.
			CO2: propose the retro synthetic pathways to a variety of drug molecules.
			CO3: Outline the chemical and molecular processes that

		take place in organic chemical reactions and conclude the principles for effective synthesis strategies, stereoselectivity and catalysis.
CHDD 233	Physical Chemistry III	CO1: understand the theories of chemical bonding and their application with help of approximate methods predict the nature of orbitals and molecular spectra.
		CO2: understand the properties of gases and liquids and the nature of the intermolecular forces in them.
		CO3: describe and explain the physical and chemical principles that underlie molecular structure determination techniques like NMR, ESR, Mossbauer, NQR and PES spectroscopy.
		CO4: understand the quantum mechanical and non-quantum mechanical methods in computational chemistry, potential energy surface and basic functions.
CHDD 234	INORGANIC CHEMISTRY PRACTICALS – II	CO1: estimate a simple mixture of ions (involving quantitative separation) by volumetric and gravimetric methods.
		CO2: predict likely spectral characteristics of given metal complexes solve the structures of unknown metal complexes using appropriate spectroscopic techniques and magnetic measurements.
		CO3: analyse the XRD of simple substances.
		CO4: interpret TG and DTA curves.
CHDD 235	ORGANIC CHEMISTRY PRACTICALS – II	CO1: predict likely spectral characteristics of given drug molecule; solve the structures of unknown molecules using appropriate spectroscopic techniques.
		CO2: develop paper chromatogram of a compound and determine its purity.
		CO3: estimate quantitatively a drug in a given sample.
		CO4: estimate colorimetrically paracetamol, protein and ascorbic acid.
CHDD 236	PHYSICAL CHEMISTRY PRACTICALS – II	CO1: Employ CADD strategies for Ligand preparation, protein preparation, and active site determination and perform docking.
		CO2: Employ data mining techniques for drug design.
		CO3: determine the activity and activity coefficient of electrolyte.
		CO4: employ spectrophotometry in determining unknown concentration.
CHDD 241	FUNDAMENTALS OF DRUG DISCOVERY	CO1: demonstrate knowledge on the most recent developments of drug design and can illustrate drug action through examples.

4			CO2: apply cheminformatic, bioinformatic tools in drug design
			CO3: Correlate the drug action with the factors modifying drug action.
			CO4: appreciate potential complications of inhibiting enzymes with drugs.
	CHDD 242	PRINCIPLES OF DRUG DESIGN	CO1: understand the basic principles of Drug design and development and the sequence of events necessary to bring a drug to market.
			CO2: recognise the role of the drug target and how its activity is screened.
			CO3: describe and justify the role and importance of the various disciplines involved in the different phases of drug discovery and development.
			CO4: understand how modern drugs were developed by using pharmacophore modelling and docking technique.
	CHDD 234	INORGANIC CHEMISTRY PRACTICALS – II	CO1: estimate a simple mixture of ions (involving quantitative separation) by volumetric and gravimetric methods.
			CO2: predict likely spectral characteristics of given metal complexes solve the structures of unknown metal complexes using appropriate spectroscopic techniques and magnetic measurements.
			CO3: analyse the XRD of simple substances.
			CO4: Interpret TG and DTA curves.
	CHDD 235	ORGANIC CHEMISTRY PRACTICALS – II	CO1: predict likely spectral characteristics of given drug molecule; solve the structures of unknown molecules using appropriate spectroscopic techniques.
			CO2: develop paper chromatogram of a compound and determine its purity.
			CO3: estimate quantitatively a drug in a given sample.
			CO4: estimate colorimetrically paracetamol, protein and ascorbic acid.
	CHDD 236	PHYSICAL CHEMISTRY PRACTICALS – II	CO1: Employ CADD strategies for Ligand preparation, protein preparation, and active site determination and perform docking.
		CO2: Employ data mining techniques for drug design.	
		CO3: determine the activity and activity coefficient of electrolyte.	
		CO4: employ spectrophotometry in determining unknown concentration.	

## Department of computer Science

### B.Sc. Computer Science

SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	CS1121	COMPUTER FUNDAMENTALS AND PROGRAMMING IN C	CO1: Remember the basics of computer.
			CO2: Understand the structure of program writing.
			CO3: Apply control structures and pointers.
			CO4: Analyze user defined functions.
	CS1132	DIGITAL ELECTRONICS	CO1: Remember the basic concepts of electronics.
			CO2: Familiarise the concept of different number systems.
			CO3: Understanding the properties of logic gates.
			CO4: Apply different techniques and theorems to simplify the sop forms.
	CS1122	VALUE EDUCATION	CO1: Remember the basic concepts on NSS and NCC.
			CO2: Understand the impacts of disaster management in different environments.
			CO3: Understand the features of Constitution of India.
	CS1141	C PROGRAMMING LAB	CO1: Use the fundamentals of C programming in trivial problem solving.
			CO2: Enhance skill on problem solving by constructing algorithms.
	CS1133	DIGITAL ELECTRONICS LAB	CO1: To familiarise with various components-Resistors, Capacitors, Diode, LED, Zener Diode & transistor.
CO2: To study clipping circuits.			

			CO3 Analyze the operation of a flip-flop and examine relevant timing diagrams.
2	CS1221	ENVIRONMENTAL STUDIES	CO1: Understand environmental systems.
			CO2: Understand the biodiversity and conservation concepts.
			CO3: Remember concepts of biodiversity and conservations.
			CO4 Understand natural systems and resources.
	CS1241	DATA STRUCTURES	CO1: Remember purpose of Data Structures.
			CO2: Understand different Data Structures.
			CO3: Apply programming languages.
			CO4: Analyze working of different data structures
	CS1242	COMPUTER ARCHITECTURE AND MICROPROCESSORS	CO1: Remember the basic concepts of computers.
			CO2: Understand the functional units of a standard PC and its working
			CO3: Understand the architectural features of 8086 processor
			CO4: Create assembly language programs for 8086 processor
	CS1243	DATA STRUCTURES LAB	CO1: Be capable to identify the appropriate data structure for given problem in C or C++
			CO2: Implement operations like searching, sorting, insertion, and deletion, traversing mechanism
			CO3: Have practical knowledge on the applications of data structures
	CS1244	ASSEMBLY LANGUAGE	CO1: Demonstrate ability to handle arithmetic operations using assembly language programming in TASM and

3		PROGRAMMING LAB	training boards.	
			CO2: Demonstrate ability to handle sorting and string operations using language programming in TASM.	
			CO3: Demonstrate programming using the various addressing modes and instruction set of 8085 microprocessor.	
		CS1341	PROGRAMMING IN JAVA	CO1: Understand the java programming and oops concepts.
				CO2: Understand the concepts of Interface, exception handling, threading, and package.
				CO3: Understand the basic concepts of Applet, Networking.
				CO4: Idea to approach and use a new package.
		CS1342	SOFTWARE ENGINEERING	CO1: Understand the importance of having a process for software development.
				CO2: Familiarize with various software testing techniques and tools.
				CO3: Apply various models in the software development projects.
				CO4: Analyze the process of software development.
		CS1343	OPERATING SYSTEMS	CO1: Understand working of various Operating Systems.
				CO2: Apply constrained resource allocation, process scheduling and memory management techniques.
			CO3: Evaluate synchronization of processes and protection of an Operating System.	
			CO4: Analyze salient features available to various Operating Systems.	
	CS1344	DATABASE	CO1: Understand the concept of database.	



		MANAGEMENT SYSTEMS	CO2: Develop skills to design an ER diagram.
			CO3: Create database using SQL and perform operations in SQL.
			CO4: Familiarize the management of concurrent transactions
	CS1345	DESIGN AND ANALYSIS OF ALGORITHMS	CO1: Develop and analyze new algorithms.
			CO2: Analyze the complexity of algorithms.
			CO3: Understand good algorithms among multiple solutions for a problem.
			CO4: Have better knowledge on fundamental strategies of algorithm design and awareness on algorithm.
	CS1346	JAVA PROGRAMMING LAB	CO1: Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
			CO2: To read and make elementary modifications to Java programs that solve real-world problems.
			CO3: Able to Validate input in a Java program.
	CS1347	DBMS LAB	CO1: Analyze the database using queries to retrieve records.
			CO2: Ability to design and implement a database schema for given problem.
CO3: Apply the normalization techniques for development of application software to realistic problems.			
4	CS1441	SYSTEM SOFTWARE	CO1: Understand different System Software.
			CO2: Analyze SIC machine architecture with its instruction sets and capable to do programming. Illustrate machine dependent, independent assemblers and macro processors.

		CO3: Remember the functions of loaders, linkers and illustrate machine dependent loaders and independent loaders.
		CO4: Understand the functions of compilers and illustrate the machine dependent and independent compilers.
CS1442	WEB PROGRAMMING AND PHP	CO1: Understand the basic skills in moderately complex use of the following tools/scripts/ languages: HTML, DHTML, CSS, Javascript.
		CO2: Apply the appropriate web tools/languages for creating state-of-the art websites.
		CO3: Understand the current trends and styles in web design and applications.
		CO4Apply PHP in web designing.
Cs1443	COMPUTER NETWORKS AND SECURITY	CO1: Remember various network technologies, design issues and characteristics.
		CO2: Understand the purpose of computer networks and the basic issues in information security.
		CO3: Apply the use of layer architecture for networking systems, information security measures.
		CO4: Analyze the concept of different models of network and the working of various ciphers.
CS1444	COMPUTER GRAPHICS	CO1: Compare various graphics devices.
		CO2: Apply various transformations to 2D and 3D graphics objects.
		CO3Analyze algorithms for clipping.
		CO4Classify various projections of 3D objects.
CS1445	MINOR PROJECT	CO1: Plan And Estimate a Project.
		CO2: Design And Analysis of a Problem.

5	CS1446	COMPUTER GRAPHICS LAB	CO3: Coding / Implementation of a Software.
			CO1: Design scan conversion problems using C/C++ programming.
			CO2: Apply clipping and filling techniques for modifying an object.
	CS1447	WEB PROGRAMMING AND PHP LAB	CO3: Understand the concepts of different type of geometric transformation of objects in 2D and 3D.
			CO1: They are able to understand the difference among the various scripting languages.
			CO2: Can show their ability to apply conceptual skills of Web Site Design and Development.
	CS1541	PYTHON PROGRAMMING	CO3: Demonstrate an understanding of Web Development Lab.
			CO1: Remember the concepts of python programming.
			CO2: Understand data types and differences.
			CO3: Apply CGI programming.
ARTIFICIAL INTELLIGENCE		CO4: Analyze the concepts of database programming in python.	
		CO1: Remember features of AI and knowledge-based systems.	
		CO2: Understand basic parsing techniques.	
CS1542	FREE AND OPEN SOURCE SOFTWARES(FOSS)	CO3: Apply search and control strategies.	
		CO4: Understand expert systems.	
		CO1: Remember FOSS concepts, features.	
CS1543		CO2: Understand Linux OS.	
		CO3: Apply shell programming.	

			CO4: Analyze various Linux commands.
	CS1551.1	DIGITAL MARKETING(O PEN COURSE)	CO1: Understand different digital marketing types.
			CO2: Understand the main concepts and key technologies of digital marketing.
			CO3: Remember the concept of e-banking, cyber security.
			CO4: Analyze the evolution of digital marketing from the existing technologies.
	CS1561.1	OBJECT ORIENTED ANALYSIS AND DESIGN(ELECTI VE)	CO1: Remember object oriented features.
			CO2: Understand Object Oriented System Development.
			CO3: Apply Unified Approach.
			CO4: Analyze various UML diagrams.
	CS1544	PYTHON PROGRAMMIN G LAB	CO1: Able to Write, Test and Debug Python Programs.
			CO2: Able to use Conditionals and Loops for Python Programs.
			CO3: Able to use functions and represent Compound data using Lists, Tuples and Dictionaries.
			CO4: Able to use various applications using python.
	CS1545	FOSS LAB	CO1: Demonstrate installation of Linux operating system and understand the importance of Linux.
			CO2: Appraise various command usage of files and directories.
			CO3: Manage shell processes using various commands and programs.
6	CS1641	DATA ANALYTICS	CO1: Remember purpose of data analytics.
			CO2: Understand the principles and tools of data analytics.
			CO3: Apply different analytical theories and methods.

			CO4: Analyze text data.
CS1642	INTERNET OF THINGS(IOT)		CO1: Remember the purpose of computer networks and its developments.
			CO2: Understand various network technologies, design issues and characteristic.
			CO3: Apply the use of layer architecture for networking systems.
			CO4: Analyze the working of different models of network and data communication.
CS1643	CYBER SECURITY		CO1: Understand the features, development and use of information systems.
			CO2: Identify the various types of information system risks, threats and pitfalls.
			CO3: Analyze the security approaches applied.
			CO4: Compare the approaches in the context of achieving security goals.
CS1661.1	MACHINE LEARNING		CO1: Remember applications of machine learning.
			CO2: Understand different learning techniques.
			CO3: Apply clustering of raw data.
			CO4: Analyse the performance of classification methods.
CS1644	MAJOR PROJECT		CO1: Create an industry-standard project through a real-life project work under time and deliverable constraints, applying the knowledge acquired through various courses.
			CO2: To provide an opportunity to apply the knowledge gained through various courses in solving a real life problem.
			CO3: To provide an opportunity to practice different phases of software/system development life cycle.

			CO4: To introduce the student to a professional environment and/or style typical of a global IT industry.
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M.Sc. COMPUTER SCIENCE			
SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	CS 511	MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE	CO1: Solve problems on Sets, functions and relations
			CO2: Describe Linear Algebra and its applications
			CO3: Analyzing Mathematical logic and Boolean algebra
			CO4: Solve problems of Probability
	CS 512	DISTRIBUTED OPERATING SYSTEMS	CO1: Describe the principles and concept of Distributed Systems and Distributed Operating Systems.
			CO2: Identify the challenges and opportunities faced by Distributed Operating Systems.
			CO3: Discuss the middleware technologies that support distributed applications such as RPC, RMI and object based middleware
			CO4: Analyze different shared memory architectures
	CS 513	DATA STRUCTURES & ALGORITHMS	CO1: Recognize the basic programming concepts in Python
			CO2: Practice the data types supported by Python
			CO3: Examine the different classifications of data Structures
			CO4: Compare the implementation of different data structures
	CS 514	COMPUTER	CO1: Explain the display technologies including LED, LCD,

		GRAPHICS & IMAGE PROCESSING	OLED, Plasma Panel
			CO2 Illustrate Bresenham's Ellipse Drawing Algorithm
			CO3 Solve 3D transformation problems including rotation, translation and scaling
			CO4: Recognize OpenGL command syntax
	CS 515	DATA STRUCTURES USING PYTHON LAB	CO1: Illustrate various data representation techniques in the real world
			CO2: Implement linear and non-linear data structures
			CO3: Formulate various algorithms based on their time and space complexity
			CO4: Develop real-time applications using suitable data structure
	CS 516	COMPUTER GRAPHICS & IMAGE PROCESSING LAB	CO1: Implement Computer graphics programs using Open GL
			CO2: Implement basic image processing algorithms in Python
			CO3: Write programs for 3D transformations of image
			CO4: Write program for histogram equalization
2	CS 521	DATABASE MANAGEMENT SYSTEMS	CO1: Explore relational database and various Normal forms and ER diagrams.
			CO2: Explain SQL and PL/SQL.
			CO3: Discuss various concepts of object oriented database.
			CO4: Identify the various kinds of data and pattern used in data mining.
	CS 522	COMPUTER NETWORKS &	CO1: Describe the basics of Networks and Reference models.

		SECURITY	CO2: Analyze security issues in network, transport and application layers and outline appropriate security protocols.
			CO3: Discuss the fundamental concepts of Information Security & Cryptography.
			CO4: Analyze different classical encryption techniques.
	CS523	SOFTWARE ENGINEERING	CO1: Apply the principles of the engineering processes ins software development.
			CO2: Demonstrate software project management activities such as planning,scheduling and Estimation.
			CO3: Model the requirements for the software projects.
			CO4: Design and Test the requirements of the software projects.
	CS 524B	CLOUD COMPUTING TECHNOLOGIE S(ELECTIVE)	CO1: Describe cloud service models.
			CO2: Discuss the architecture of Clouds.
			CO3: Explain about virtualization in clouds.
			CO4: Describe web services and applications.
	CS 525	NETWORK PROGRAMMIN G IN JAVA LAB	CO1: Develop a basic knowledge of programming constructs.
			CO2: Explore basic knowledge of networking.
			CO3: Analyze socket programming with Java.
			CO4: Develop socket programs and client server applications.
CS 526	DBMS & DATA MINING LAB	CO1: Describe various kinds of tools in DBMS.	
		CO2: Analyze the mining techniques for realistic data, and also to conceptualize Data Mining and the need for pre-processing.	



3			CO3: Develop the algorithms used for various types of Data Mining Problem.
			CO4: Construct algorithms to solve data mining problems using WEKA tool.
	CS 531	AUTOMATA THEORY & COMPILER DESIGN	CO1: Evaluate concepts in automata theory and theory of computation.
			CO2: Formulate grammars and recognizers for different formal languages.
			CO3: Prepare Finite Automata, NFA, Push Down Automata.
			CO4: Explain Turing Machines and types of Turing Machines.
	CS 532	BIG DATA ANALYTICS	CO1: Familiarize the fundamentals of Bigdata and Data Analysis.
			CO2: Discover Stream Computing, Analytics and Frameworks.
			CO3: Discuss the fundamentals of RDF and Querying the Semantic Web.
			CO4: Explain the concepts of HDFS and MapReduce framework.
	CS 533	ARTIFICIAL INTELLIGENCE	CO1: Investigate the applications of artificial intelligence.
			CO2: Explain about learning systems and its application scope.
			CO3: Illustrate knowledge representation and its structures.
			CO4: Define machine learning.
CS 534C	BIOINFORMATICS (ELECTIVE)	CO1: Acquire basic knowledge in Life science.	
		CO2: Obtain detailed knowledge about Bioinformatics.	

			CO3: Appreciate the design of biological databases to hold enormous data.
			CO4: Implement algorithms used for sequence analysis.
	CS 535	MAJOR PROJECT (PHASE I)	CO1: Create an industry-standard project through a real-life project work under time and deliverable constraints, applying the knowledge acquired through various courses.
			CO2: To provide an opportunity to apply the knowledge gained through various courses in solving a real life problem.
			CO3: To provide an opportunity to practice different phases of software/system development lifecycle.
	CS 536	SEMINAR	CO1: The students should undertake a detailed study on the topic and submit a report at the end of the semester. Marks will be awarded based on the topic, presentation, participation in the seminar and the report submitted.
	CS 537	DATA ANALYTICS LAB	CO1: Describe the installation of Hadoop.
			CO2: Implement some programs in Hadoop.
			CO3: Implement fewMap Reduce programs.
			CO4: Install and Run Hive.
4	CS 541	RESEARCH METHODOLOGY & REPORT WRITING	CO1: Introduce concepts in research methodology and technical writing.
			CO2: Overview of research process.
			CO3: Introduction of concepts statistical data analysis and use of statistical functions in R language.
			CO4: Importance of publishing the results of research.
	CS 542C	COMPUTER VISION(ELECTIVE)	CO1: Describe basic principles of computer vision.
		CO2: Develop understanding of the basic image operations.	

			CO3: Explain image feature detection and matching.
			CO4: Explore basic theory of edge detection.
	CS 543	MAJOR PROJECT (PHASE II)	CO1: Demonstrate a sound technical knowledge of their selected project topic.
			CO2: Project-based learning connects students to the real world.
			CO3: Demonstrate the knowledge, skills and attitudes of a professional engineer.
	CS 544	COMPREHENSIVE VIVA	CO1: Demonstrate knowledge in the program domain.
			CO2: Present his views cogently and precisely.
			CO3: Exhibit professional etiquette suitable for career progression.

SNC CHERTALA

## DEPARTMENT OF ECONOMICS

### B.A ECONOMICS

SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	EC 1141	INTRODUCTORY MICROECONOMICS	CO1: To develop a conceptual foundation and analytical methods used in
2	EC 1241	INTERMEDIATE MICROECONOMICS	CO1: The course intends to give basic understanding of Micro Economics
3	EC 1321	INFORMATICS FOR APPLIED ECONOMETRICS	CO1: This course introduces a plethora of online resources which will help students improve their teaching-learning experience.
			CO2: The students will also be able to utilize these web resources to enhance their career and academics.
			CO3: The course also provides an exposition to econometric concepts and techniques. This is to enable the students to conduct and criticize empirical studies in economics and related fields.
			CO4: It covers estimation and diagnostic testing of simple regression. Models using computer software
4	EC 1341	INTRODUCTORY MACROECONOMICS	CO1: This course offers a short introduction to Macroeconomics. CO2: After introducing the multiplier and the Keynesian theory of income determination, the course further introduces the student to IS.LM analysis
	EC 1441	MATHEMATICAL METHODS FOR ECONOMICS	CO1: The key objective of this paper is to provide the students an insight into the importance of mathematical methods in Economics and also to familiarize them with the basic mathematical techniques used in economic analysis
4	EC 1442	INTERMEDIATE MACROECONOMICS	CO1: To introduce students to the micro foundations of macroeconomics, inflation and unemployment, economic growth and fiscal and monetary policies in an open economy
	EC 1541	METHODOLOGY AND PERSPECTIVES	CO1: The course intends to familiarize the students with the broad contours of Social Sciences, specifically Economics and its methodologies, tools and analysis

5		OF SOCIAL SCIENCE	procedures. CO2: The course also aims to create an enthusiasm among students, incorporating various concepts and issues in economics
	EC 1542	STATISTICAL METHODS FOR ECONOMICS	CO1: The course is intended to familiarize the students with statistical tools and techniques and enable them to apply these tools in Economics
	EC 1543	READINGS IN POLITICAL ECONOMY	CO1: Readings in Political Economy offers a short introduction to the economic thoughts of Adam Smiths, David Ricardo, Karl Marx, JM Keynes etc.
	EC1544	ECONOMIC GROWTH AND DEVELOPMENT	CO1:To ensure that students begin to understand basic concepts of Economic Growth.
			CO2: Development and thereby enable them to acquire multi-dimensional aspects of developmental issues
			CO3: To convey knowledge about theoretical framework of Growth and Development under different Schools of economic thought
			CO4: To impart knowledge about Political institutions, the role of the state in Economic.
EC1545	INTERNATIONAL ECONOMICS	CO1: To understand the basic concepts and theories of international trade and enable students to have a basic understanding of the emerging trends, issues and policies in the field of international economic system	
EC1551.2	HUMAN RESOURCE MANAGEMENT	CO1: Keeping in view the broad objective of an open course in providing the basis for life enrichment and career orientation, a course in Human Resource Management is offered..	
		CO2: The course is aimed at providing basis for understanding the significance of human resource in the growth of our economy and society and to learn the ways for integrating H.RM strategies in organizations.	
6	EC1641	INDIAN ECONOMY	CO1: The course intends to provide an understanding about growth process in Indian economy, sectoral aspects of the economy by focusing agriculture, industry and service sectors, relations of India with external sector and economic reforms.
	EC1642	BANKING AND FINANCE	CO1: The course intends to familiarize the students with the basic concepts in Banking and Finance and develop a comprehensive knowledge on the role of banks in the operation of an economy.

			CO2: It also enables them to know the operation of the Indian Financial System and activities in the financial markets
	EC1643	PUBLIC ECONOMICS	CO1: The course is aimed at a. Introducing the subject matter and scope of public economics, role of government, types of market failures and the concept of public good  b. Providing a general understanding on the basic fiscal policy instruments c. Generating awareness on public economics in India, with special focus on budgetary system and fiscal federalism
	EC 1644	ENVIRONMENTAL ECONOMICS AND DISASTER MANAGEMENT	CO1: The course intends to create environmental awareness among students and provide exposure to disaster management
	EC1661.1	KERALA ECONOMY	CO1: To understand the structural changes, Sector-wise contribution and features of the Kerala Economy since the formation of the state and enable the students to have a basic understanding of the emerging trends and issues of Kerala Economy

MA Economics			
SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	EC 211	MICRO ECONOMICS – I	CO1: The purpose of the course is to provide an understanding of the principles of economics in application to individual decision makers, both consumers and firms.
			CO2: This course equips the students themselves with the various aspects of the conventional as well as the recent developments in microeconomic theory.
	EC 212	ECONOMICS OF GROWTH AND DEVELOPMENT	CO1: The objective of this paper is to familiarizing students with the conceptual routes, theoretical dynamics and practical strategies of growth and development.  CO2: It is expected that this course would orient them towards major themes of development, lead them

			towards more methodical probes and equip them with adequate analytical knowledge.
	EC213	INDIAN ECONOMIC POLICY – I	CO1: The Purpose of this course on Indian Economy is to enable the students to have an understanding of the various issues of the Indian Economy with a policy perspective. CO2: The focus of the syllabus is on the development perspectives of Indian Economy during the post Liberalization period since 1991.
	EC214	QUANTITATIVE METHODS FOR ECONOMICS	CO1: familiarizing the students the basic quantitative techniques used in economic analysis CO2: Enabling the students in making use of a quantitative approach in formulating economic problems. CO3: Inculcating analytical ability in finding solutions to mathematically formulated economic problems.
	EC 221	MICRO ECONOMICS – II	CO1: This course is intended to give insights into developments in the areas of theories of distribution, general equilibrium, welfare economics, uncertainty and informational asymmetry and behavioral economics.
	EC222	ECONOMICS OF SOCIAL SECTOR AND ENVIRONMENT	CO1: Understand and apply the key economic concepts in the context of social sectors like education, environment and healthcare CO2: Appreciate how economic factors contribute to the development and implementation of educational policies CO3: Identify the major theories governing the development of human resources, school improvement and development CO4: Recognize the important linkages between the environment and economics CO5: Be aware of the key environmental issues around the globe CO6: Understand approaches to identify and value costs and outcomes to include in economic evaluation of the environment through benefit cost analysis.
2	EC223	INDIAN ECONOMIC POLICY – II	CO1: to introduce the basic concepts of economics to the students so as to enable them for further learning in Indian and Kerala Economy CO2: to equip the students with the basic idea for further learning. CO3: to help them to analyze the sectoral development that has taken place India as well as in Kerala economy.
	EC224	ECONOMETRICS	CO1: to create an understanding among the students on

		AND RESEARCH METHODOLOGY	<p>basic econometric methodology</p> <p>CO2: to train the students in applying economic theories to real economic data by means of empirical models</p> <p>CO3: to give a comprehensive idea on the process of doing research in economics.</p>
3	EC231	MACRO ECONOMICS – I	CO1: The important objective of the paper is that the students should able to understand the structural underpinnings of theoretical development of macroeconomic thoughts and their application.
	EC232	INTERNATIONAL ECONOMICS – I	<p>CO1: This course offers an introduction to the main theoretical tools and policies that are central to the study of international trade, but with an emphasis on application to the trade flows, trading blocks and international macroeconomic events that characterize the global economy today.</p> <p>CO2: The ability to use economic analysis to reach a deeper understanding of international trade will be an important formative element for those who intend to develop careers in international business and management.</p>
	EC233	PUBLIC ECONOMICS	<p>CO1: The important objective of this course is that the student should able to understand the regulatory and developmental responsibilities of government in a democratic country like India.</p> <p>CO2: It covers the theoretical and empirical dimensions of public goods and public choice, fiscal instruments and fiscal federalism with special reference to Indian context. It also covers the present fiscal management issues of India.</p>
	EC201	AGRICULTURAL ECONOMICS	<p>CO1: The objective of this course is to develop the knowledge and understanding of basic principles and practice of Economics as required in Agricultural Economics.</p> <p>CO2: The course also aims at equipping the students with the knowledge and skills required to analyze the agricultural economic issues for efficient use of scarce resources in agriculture sector and its development, consistent with the interest of all stake holders.</p>
	EC241	MACRO ECONOMICS – II	<p>CO1: The important areas included in this portion are the theoretical development of the macroeconomic issues of inflation, unemployment and business fluctuations.</p> <p>CO2: The development of macro economics after Keynesian revolution, divided into classical school and</p>



4			Keynesian school, and the impacts of various macroeconomic policies in the society are also covered here.
			CO3: By learning this paper, the students should be able to keep abreast with the latest development of macroeconomics development.
	EC242	INTERNATIONAL ECONOMICS – II	CO1: The objective of this course is to introduce to students the theories of international finance flows, determination of interest and exchange rates in interconnected economies, macroeconomic policies available to the government, and the nature of financial crises. CO2: The course also aims to provide a framework for consistent reasoning about international flows of goods, factors of production, and financial assets, trade policy and monetary policy in open economy.
	EC243	FINANCIAL SECURITIES MARKET ANALYSIS	CO1: This course is designed to provide comprehensive study of the significance of Securities Market in modern financial system. CO2: It includes a discussion of the efficient securities markets theory in finance, covers bond pricing, price-earnings models of share valuation, and introduces the top down approach to investment decisions. CO3: The emphasis is on a thorough coverage of modern finance theory as applied to investment analysis, balanced with a consideration of new developments in the discipline, and of the application of both old and new theoretical perspectives to understand the current environment for financial investment decisions.
	EC2010	INDUSTRIAL ECONOMICS	CO1: The course is designed to use theoretical models to understand industries and regulatory decision making and so students should expect to use diagrams and some basic mathematical models. CO2: It also provides guidelines to urge through knowledge to the students on the basic issues in the industrial development of India. CO3: In addition, course aims for the students acquire fair knowledge of international experience of industrial progress.

## DEPARTMENT OF GEOLOGY

### B.Sc. GEOLOGY

SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	GL 1141	GENERAL PERSPECTIVES OF GEOLOGY	CO 1: Understand the significance of various branches of Geology, the concept of rock cycle; describe characteristics of earth and its origin in relation to the Solar System and the Geological Time Scale.
			CO 2: Understand and explain endogenic processes, the theories and hypothesis of plate tectonics, Continental drift and Sea-floor spreading; ideas of plate boundaries, plate movements and associated geological features.
			CO 3: Understand and explain Mountains and types, volcanoes, their classification, products and global distribution; and earthquakes, types, causes, effects; elastic rebound theory, seismic waves, scale of measures and seismic belts of world.
			CO 4: Understand the various field methods in Geology, the principles and accessories.
1	GL 1442	PHYSICAL GEOLOGY, GEOMORPHOLOGY, CRYSTALLOGRAPHY AND MINERALOGY	CO 1: Understand the applications of geological field instruments, toposheets and maps.
			CO 2: Determine slope of terrain, latitude and longitude, distance between places in toposheets; and epicenter of earthquakes
2	GL 1221	GEOINFORMATICS AND GEOMORPHOLOGY	CO 1: Understand the basic aspects of Photogeology and Remote Sensing in relation to electromagnetic spectrum; fundamentals of GIS and applications of remote sensing and GIS in the field of geosciences.
			CO 2: Understand and explain exogenic processes, with emphasis on weathering, soils and mass wasting.
			CO 3: Understand and describe the different geological agents, viz., streams, groundwater, oceans, glaciers, wind and lakes.
			CO 4: Understand and illustrate the geological actions of the various geological agents and their associated landform features.
2	L 1442	PHYSICAL GEOLOGY, GEOMORPHOLOGY	CO 1: Identify drainage patterns and landforms and delineate drainage basins in toposheets; illustrate hydrological cycle, drainage networks, stream meanders

		GY, CRYSTALLOGRA PHY AND MINERALOGY	and ox-bow lakes and dune types. CO 2: Prepare thematic maps from toposheets and carry out morphometric analysis of simple drainage basins.
3	GL 1341	CRYSTALLOGRA PHY AND MINERALOGY	CO 1: Understand the elements of crystallography, the morphology and symmetry elements of crystals, the laws of crystallography, working principle of Goniometer; describe the classification of crystals into systems and classes, explain crystal notations and indices and the types of crystal forms.
			CO 2: Understand and describe the symmetry, simple forms and combinations of the different crystal classes of the six crystal systems.
			CO3: Understand and explain the various aspects of twinning and imperfections in crystals such as the elements of twinning, the twin laws, and acquire basic knowledge of types of crystallographic projections and application of Wulff net.
			CO4: Understand basic ideas of Mineralogy regarding its scope and aim; and describe the important physical properties of minerals.
	GL 1442	PHYSICAL GEOLOGY, GEOMORPHO LOGY, CRYSTALLOGRA PHY AND MINERALOGY	CO1: Describe and illustrate the symmetry elements and identify and describe the crystal models of Normal classes of the six crystal systems.
			CO2: Determine and explain the various physical properties of minerals.
4	GL 1441	OPTICAL, CHEMICAL AND DESCRIPTIVE MINERALOGY	CO1: Understand the basic concepts and principles of Optical Mineralogy; describe the parts and uses of Petrological microscope and optical accessories and explain pleochroism, birefringence and indicatrix.
			CO2: Understand the ideas of Chemical Mineralogy and explain bonds in minerals; morphological characters of minerals and solid solution and exsolution in minerals.
			CO3: Understand and describe classification of minerals and silicate structures.
			CO4: Understand and explain systematically the physical, chemical and optical properties of silicate and non-silicate minerals.
	GL 1441	OPTICAL, CHEMICAL AND DESCRIPTIVE	CO 1: Describe the megascopic properties of minerals and identify different minerals.
			CO 2: Determine and describe the various optical

		MINERALOGY	properties of important minerals under the microscope.
5	GL 1541	IGNEOUS PETROLOGY	CO1: Understand the basic concept of rock cycle, origin of igneous rocks from magma, the Bowen's reaction series; explain the important binary systems, the petrotectonic settings and diversity of igneous rocks in relation to various processes.
			CO 2: Understand, classify and explain the forms of intrusive and extrusive igneous rocks and the different igneous structures and textures.
			CO3: Understand, classify and describe the different modes of classification of igneous rocks and explain CIPW norm and normative minerals.
			CO4: Understand and explain systematically the texture, mineralogy, classification, occurrence and origin of granites and basalts; and describe the brief petrographic character of common igneous rocks.
	GL 1542	SEDIMENTARY PETROLOGY AND METAMORPHIC PETROLOGY	CO1: Understand and explain significance of palaeontology, the conditions and methods of fossilization, classification and nomenclature of fossils and the basic principles of Taxonomy, Systematics and Binomial nomenclature.
			CO2: Understand and explain the morphology, classification, geological history and stratigraphic importance of Phylum Protozoa, Phylum Coelenterata – Class Anthozoa, Phylum Brachiopoda, Phylum Mollusca – Classes Pelecypoda, Gastropoda, Cephalopoda.
			CO3: Understand and describe the morphology, classification, geological history and stratigraphic importance of Phylum Arthropoda – Class Trilobita, Phylum Echinodermata – Class Echinoidea and Phylum Hemichordata – Class Graptolithina.
			CO4: Understand the basic ideas of Micropalaeontology and describe the characteristics of important plant fossils
	GL 1543	PALAEOLOG Y	CO1: Understand and explain significance of palaeontology, the conditions and methods of fossilization, classification and nomenclature of fossils and the basic principles of Taxonomy, Systematics and Binomial nomenclature.
			CO2: Understand and explain the morphology, classification, geological history and stratigraphic importance of Phylum Protozoa, Phylum Coelenterata – Class Anthozoa, Phylum Brachiopoda, Phylum Mollusca – Classes Pelecypoda, Gastropoda, Cephalopoda.

		<p>CO3: Understand and describe the morphology, classification, geological history and stratigraphic importance of Phylum Arthropoda – Class Trilobita, Phylum Echinodermata – Class Echinoidea and Phylum Hemichordata – Class Graptolithina.</p> <p>CO4: Understand the basic ideas of Micropalaeontology and describe the characteristics of important plant fossils</p>
GL 1544	ENVIRONMENTAL GEOLOGY	<p>CO 1: Understand and explain the basic concepts of Environmental Geoscience, the environment, ecosystem; describe the significance of anthropogenic environment and natural resources, their classification, conservation, utilization and relation to the environment; explain the concept of sustainable development and highlight the impacts of mining on the environment.</p> <p>CO 2: Understand and describe the various aspects of environmental especially water pollution and air pollution; explain air pollution in relation to climate change with importance to greenhouse effect and ozone depletion.</p> <p>CO 3: Understand and describe the basic ideas of Environmental Planning and Management, Environmental Impact Assessment, Environmental awareness and the laws; describe the environmental impacts of urbanization, geology in relation to urban planning and the role of geologists in environmental conservation.</p> <p>CO 4: Understand and explain various natural hazards like Earthquakes, Storms, Floods, Tsunamis, Volcanic activity, Landslides, Soil erosion and their environmental consequences.</p>
GL 1644	PETROLOGY AND PALAEOLOGY	<p>CO1: Understand and describe the megascopic and microscopic properties of important igneous, sedimentary and metamorphic rocks and identify the rocks.</p> <p>CO2: Understand, identify, draw and describe the megascopic characteristics of important fossils belonging to various Phyla and important plant fossils and identify them.</p>
GL 1641	ECONOMIC GEOLOGY	<p>CO1: Understand history of development of Economic Geology, the terminologies associated with the subject and the classification schemes of economic mineral deposits.</p> <p>CO2: Understand and explain the various processes of</p>

6			formation of ore mineral deposits, both internal processes and external processes.
			CO3: Understand and describe metallogenic epochs and provinces with reference to India and mode of occurrence, distribution in India and important economic uses of important ore minerals; understand and describe materials for Abrasives, Refractories, Ceramics and Cement; Gemstones; Strategic and Critical minerals.
			CO4: Understand and describe the Mineral Policy of India; the detailed account of the fuel minerals coal and petroleum, with reference to their origin, mode of occurrence and distribution in
	GL 1642	STRATIGRAPHY AND STRUCTURAL GEOLOGY	CO1: Understand and describe the basic principles of Stratigraphy and breaks in stratigraphic successions and their significance; understand and explain the elements of stratigraphic classification, Geological Time Scale, Stratigraphic correlation and define typical terms related to stratigraphic studies. CO 2: Understand and describe the basic terminologies in Structural Geology, the Rule of V's and characteristics of primary and secondary structures. CO3: Understand and describe rock deformation, the different stages; concepts and applications of stereographic projection in Structural Geology, foliations and lineations; and geological mapping techniques and procedures. CO 4: Understand and describe the folds, faults and joints with reference to their origin, terminologies, classification and geological significance.
	GL 1661.1	GROUND WATER INVESTIGATION AND MANAGEMENT	CO1: Understand groundwater in relation to hydrological cycle and explain hydrometeorology and its significance; describe hydrological measurements of important parameters. CO2: Understand and describe the occurrence of groundwater, the properties of aquifers and their types; define and explain the Darcy's law governing groundwater movement and flow directions. CO4: Understand and describe the groundwater provinces of India and the groundwater conditions in Kerala.
	GL 1645	ECONOMIC GEOLOGY AND	CO 1: Understand, describe the megascopic properties and identify important ore and industrial minerals.

	STRUCTURAL GEOLOGY	CO 2: Understand and illustrate the important structural features and attitude of beds; Rule of V's, draw and carry out the procedures of analysis of geological maps with different structural features; work out problems related to true and apparent dip, true vertical thickness and width of out crops and solve three point problems; and draw stereographic projections of structural features.
GL 1646	PROJECT AND FIELD WORK	CO 1: Understand the techniques of geological mapping, the instruments used during geological fieldwork and carry out geological field work and collect geological samples.
		CO 2: Visit recognized geological institutions and research departments within India and understand the geological activities and research carried out by these institutions and departments; and develop the knowhow of geological fieldwork report writing.

SNC CHERTHERIA

## DEPARTMENT OF HISTORY

### B.A HISTORY

SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	HY1141	DISCIPLINE OF HISTORY & SOCIAL SCIENCES: METHODOLOGY AND PERSPECTIVES	CO1: To understand the myriad disciplines of Social Sciences with particular reference to History and its methodology.
			CO2: To understand the autonomy of the discipline of history and the pluri- multi character of the discipline.
			CO3: To apply different theories in understanding past.
			CO4: To analyze and evaluate the historical process in relation to power relations of the society.
			CO5: To Evaluate the methodology and objectivity of the discipline of history.
			CO6: To create critical history introspecting power relations.
2	HY1241	GLOBAL HISTORY: SOCIO-CULTURAL FORMATIONS IN THE EARLY PERIOD	CO1: To understand the theoretical and ideological background evolution of the world and human origin
			CO2: To understand the social evolutions of the early world
			CO3: To analyze the process cultural formations of the early world
			CO4: To evaluate the genesis and growth of state and society early world
	HY 1321	RECONSTRUCTING THE PAST	CO1: To learn the theory and practice of historical research as practiced by professionals
			CO2: To understand the method of writing history.
			CO3: To analyse the various tools pertaining to the writing of history.
			CO4: To construct original historical arguments based on primary source material research
HY1341	UNDERSTANDING STATE AND	CO1: Locate major pre-historic settlements and evolution of early farming communities	



3		SOCIETY IN EARLY INDIA	CO2: Examine the evolution of Varna and Jatibased social structure in Early India.
			CO3: Critique the social base of heterodox religions of 6 <sup>th</sup> Century BC and its influence in power relations.
			CO4: Appraise the cultural achievements of the Guptas
			CO5: Differentiate Tamil literary traditions and locate Tinal's across time and region.
4	HY1441	STATE AND SOCIETY IN PRE-COLONIAL INDIA	CO1: To get an overview of the political, cultural, social and economic life in Medieval India
			CO2: To focus on the regional cultures during the period.
			CO3: To appraise the linkage effect of the Medieval Period in subsequent centuries.
			CO4: Interpret the social cultural and administrative features during the Medieval Period
			CO5: Develop practical skills helpful in the study and understanding of historical events.
	HY1442	SOCIAL FORMATIONS IN EARLY SOUTH INDIA	CO1: Understand the socio, economic and cultural condition of the pre modern South India
			CO2: To identify the sources for the history of South India
			CO3: Discuss the contribution of Pallavas and Cholas to South Indian art and architecture.
CO4: To examine features of social formation in early South India.			
		CO5: To appraise the transformation from Argo-pastoral to agrarian social formation by exploring areas like economy, society and historical process of state formation.	
5	HY 1541	CORE MAJOR TRENDS IN HISTORICAL THOUGHTS AND WRITINGS - PART I	CO1: To understand the myriad forms of representing past and differentiating history from the other forms of representation of past.
			CO2: To analyse the genesis and development of historical thought and writing in different times and spaces or societies.
			CO3: To analyse the philosophical foundations of the discipline of history and its changing nature in

			accordance with time and space.
			CO4: To evaluate the types of historical literature.
			CO5: To create scientific and analytical history.
	HY 1542	CAPITALISM AND COLONIALISM: FORMS OF RESISTANCE IN INDIA	CO1: To understand the theoretical and ideological background of colonialism and capitalism
			CO2: To understand the socio-economic and cultural impingement of colonial intervention
			CO3: To analyze the process of colonizing India against the backdrop of theoretical insights
			CO4: To evaluate the genesis and growth of critical intervention of the colonial subjects towards the British Raj
	HY 1543	PRE-MODERN KERALA	CO1: To understand the historical and cultural evolution through the sources of Kerala history
			CO2: To understand geographical feature and uniqueness of Kerala
			CO3: To evaluate the concept of cultural symbiosis and its impact on material culture and society of Kerala
			CO4: To understand and evaluate the significance of the social reform movements in Kerala
	HY 1544	MAKING OF A NATION IN INDIA	CO1: To understand the theoretical perceptions of nation and nationalism
			CO2: To evaluate the making process of the nation in India
			CO3: To analyze the ideological underpinnings behind the construction of nation in India on the backdrop of theoretical insights
			CO4: To account a sound knowledge about changes that took place among the historians regarding the notion of national movement in India
	HY1545	TRANSITION TO MODERN WORLD	CO1: To understand the theoretical and ideological background of transformation towards the modern world.
			CO2: To understand the socio-economic, cultural and political intrusions of the process of modern world.
			CO3: To analyze the process and global impacts of revolutions.
			CO4: To evaluate the genesis and growth of new nationalism and its aftermath
	HY1546	HISTORICAL	CO1: To understand the method of writing history

		METHOD: MECHANICS OF PROJECT WRITING	CO2: To understand the various tools pertaining to the writing of history and its application in history writing CO3: To understand the new theories and concepts in historical methodology and its application in analysing and interpreting the past				
	HY 1551.2	PRINCIPLES AND METHODS OF ARCHEOLOGY	CO1: Explain the evolution and growth of Archaeology in India. CO2: Define Archaeology and its relation with other disciplines CO3: Examine the techniques of Exploration and Excavation. CO4: Discuss different dating methods in Archaeology. CO5: Distinguish the nature, development and value of Archaeology as a discipline.				
	6	HY 1641	MAJOR TRENDS IN HISTORICAL THOUGHT AND WRITING -PART II	CO1: To understand the myriad developments in the historical thought and writing in the Modern West and Modern India CO2: To analyse the colonial roots of Indian Historiography and evaluate the multiple Indian responses to it. CO3: To evaluate the critical responses from the subaltern and Women's history approaches. CO4: To evaluate the Total History approach and post-modern turn in historical thinking and writing. CO5: To create critical history.			
				HY 1642	MODERN KERALA	CO1: To analyse the changing nature of Socio, political and economic structure of Kerala against the backdrop of Colonial Modernity. CO2: To evaluate the process of socio-cultural symbiosis and the negotiations and contestations of myriad social categories CO3: To evaluate the process of democratization of Kerala society and polity. CO4: To critically understand the Kerala Model Experience	
						HY 1643	CONTEMPORAR Y INDIA

			post- independent India
	HY 1644	TWENTIETH CENTURY WORLD	CO1: To understand the theoretical and ideological background of socialist revolutions and its impact on the twentieth century world
			CO2: To understand the political, socio-economic, cultural outcomes of two world wars
			CO3 To analyze the process of authoritarian and totalitarian concepts
			CO4 To critically evaluate the exertion of world peace organization
			CO5 To understand the theoretical and ideological background of global politics and the world wars

COMPLEMENTARY COURSES OF HISTORY			
SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOME
1	HY 1131.1	HISTORY OF NATIONAL MOVEMENT IN INDIA PART I	CO1: To understand the theoretical perceptions of colonialism to imperialism
			CO2: To evaluate the socio-cultural roots of colonialism
			CO3: To analyze the ideological and historical backdrop of the social reform movements and its reactions to the process of making of a nation
			CO4 To account a theoretical insight of the national movement
	HY 1131.2	HISTORY OF MODERN WORLD PART I	CO1: To understand the theoretical and ideological background of revolution and its impact
			CO2: To understand the political, socio-economic, changes of the 19 <sup>th</sup> century world
			CO3: To analyze the process of economic Revolutions
			CO4: To evaluate the new trends and ideas
	HY 1231.3	HISTORY OF NATIONAL MOVEMENT IN	CO1: To understand the theoretical perceptions of nation and nationalism
			CO2: To evaluate the economic impacts of the British Raj

2		INDIA PART II	CO3: To analyze the ideological underpinnings behind the construction of nation in India on the milieu of theoretical insights
			CO4: To account a historiographical insight on Gandhian ideology
	HY 1231.4	HISTORY OF MODERN WORLD PART II.	CO1: To understand stages of colonialism and colonial expansions
			CO2: To understand the political outcome of world war I
			CO3: To analyze the process of socialist revolution in Russia
			CO4: To critically evaluate the socialist policies after the revolution
	HY 1331.5	HISTORY OF NATIONAL MOVEMENT IN INDIA PART III.	CO1: To understand the historical roots of national movement
			CO2: To evaluate the various social class role in the national movement
			CO3: To analyze the theoretical perceptions on national Movement
			CO4: To account the making process of nation in India
3	HY 1331.6	HISTORY OF MODERN WORLD PART III	CO1: To understand the theoretical and ideological background of dictatorships
			CO2: To understand the process of World War II
			CO3: To analyze the post war developments in the world
			CO4: To critically evaluate the role of India in the postwar world
4	HY 1431.7	CONTEMPORARY INDIA	CO1: To understand the process of national integration
			CO2: To understand making process of the constitution
			CO3: To analyze the political and economic changes in the post-independent India
			CO4: To account the problems and issues in post independent India
	HY 1431.8	CONTEMPORARY WORLD	CO1: To understand the theoretical and ideological concepts of neo colonialism
			CO2: To understand the growth and role of third Worlds
			CO3: To analyze the process and functions of post-world war organizations
			CO4: To critically evaluate and debate on the contemporary issues of the world

**DEPARTMENT OF MALAYALAM**

**B.A MALAYALAM**

<b>SEME STER</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>	<b>COURSE OUTCOME</b>
<b>1</b>	ML1111.1	Addl.Lang.I മലയാളകവിത	C01.മലയാളകവിതയുടെ ചരിത്രപരമായ വികാസത്തെക്കുറിച്ചുള്ള അവബോധം നേടുന്നു . C02. കവിതാനിരൂപണം തയ്യാറാക്കുന്നു C03. .കവിതകളെ സൂക്ഷ്മമായി വിശകലനം ചെയ്യാനുള്ള പ്രാപ്തി കൈവരിക്കുന്നു C04. കാവ്യഘടകങ്ങളെ കുറിച്ചുള്ള സൂക്ഷ്മധാരണ ഉണ്ടാകുന്നു
	ML1111.2	Addl.Lang.I സാഹിത്യപഠനം1	C01. മലയാളത്തിലെ നോവൽ നാടകം സഞ്ചാരസാഹിത്യം തിരക്കഥ എന്നീ സാഹിത്യരൂപങ്ങളുമായി പരിചയപ്പെടുന്നു C02.സാഹിത്യരൂപങ്ങളുടെ രചനാതന്ത്രങ്ങൾ മനസ്സിലാക്കുന്നു C03.സർഗ്ഗാത്മക രചനകളിൽ ഏർപ്പെടാനുള്ള ശേഷി ലഭിക്കുന്നു. C04. സാഹിത്യ രചനകളെ വിശകലനം ചെയ്ത് നിരൂപിക്കുന്നതിനുള്ള പ്രാപ്തി നേടുന്നു
	ML1141	നോവൽ സാഹിത്യം	C01. നോവലിന്റെ പ്രമേയം, ഭാഷ, ഭാവുകത്വ പരിണാമം എന്നിവ മുൻനിർത്തി അപഗ്രഥിക്കുന്നു. C02.നോവൽ നിരൂപണത്തിനുവേണ്ട വിശകലനബുദ്ധി രൂപപ്പെടുത്തുന്നു. C03 പുതു നോവലുകളുടെ സൗന്ദര്യശാസ്ത്രത്തെ കണ്ടെത്തുകയും അവ വായനയിൽ പ്രയോജനപ്പെടുത്തുകയും ചെയ്യുന്നു C04. ഇന്ത്യൻ നോവലുകളെയും ലോക നോവലുകളെയും അടുത്തറിയുകയും താരതമ്യ വിശകലനം നടത്തുകയും ചെയ്യുന്നു
	ML1131.1	കേരളപഠനം	C01.കേരളത്തിലെ ഭാഷ, സാഹിത്യം

		നം 1	കലാരൂപങ്ങൾ എന്നിവയുടെ വികാസത്തിന് കളമൊരുക്കിയ സാംസ്കാരികവും രാഷ്ട്രീയവുമായ പശ്ചാത്തലത്തെ മനസ്സിലാക്കുന്നു CO2. സാംസ്കാരികത്തനിമ തിരിച്ചറിയാൻ സാധിക്കുന്നു. CO3. ദേശീയബോധം വളരുന്നതിനൊപ്പം പൗരത്വ വികാസവും സ്വായത്തമാക്കുന്നു CO4. ചരിത്രവും സംസ്കാരവും രേഖപ്പെടുത്താനുള്ള പ്രേരണ ഉണ്ടാക്കുന്നു
2	ML1211.1	Addl.Lang.II ഗദ്യസാഹിത്യം	CO1. മലയാളത്തിലെ പ്രധാന ഗദ്യസാഹിത്യരൂപങ്ങളെക്കുറിച്ച് സാമാന്യ അവബോധം പ്രാപ്തമാക്കുന്നു . CO2.ഗദ്യരൂപങ്ങളുടെ ഉൽപ്പത്തി വികാസപരിണാമങ്ങൾ അപഗ്രഥിക്കുന്നു . CO3.എഴുത്തുകാരുടെ രചനാ ശൈലിയെ താരതമ്യാത്മകമായി നിരീക്ഷിക്കുന്നു. CO4.രചനകളെ വിശകലനം ചെയ്യാനുള്ള ഭാവുകത്വശേഷി വികസിക്കുന്നു .
	ML1211.2	Addl.Lang.II സാഹിത്യപഠനം 2	CO1. മലയാളത്തിലെ കവിത, കഥ, ഉപന്യാസം എന്നീ സാഹിത്യ ശാഖകളുമായി പരിചയപ്പെടുന്നു CO2. മലയാളത്തിലെ കവിത കഥ ഉപന്യാസം എന്നീ സാഹിത്യ ശാഖകളുമായി പരിചയപ്പെടുന്നു CO3. സർഗാത്മക രചനയിൽ ഏർപ്പെടാനുള്ള ശേഷിയും കാവ്യാസ്വാദന താൽപര്യവും വർദ്ധിക്കുന്നു CO4. പ്രായോഗിക വിവർത്തനത്തിൽ (ഇംഗ്ലീഷിൽ നിന്ന് മലയാളത്തിലേക്കും മലയാളത്തിൽ നിന്ന് ഇംഗ്ലീഷിലേക്കും) പരിശീലനം ലഭിക്കുന്നു

ML1241	CORE COURSE 2 നാടകസാഹിത്യം	<p>CO1. നാടകത്തിന്റെ ഉത്ഭവവികാസ പരിണാമങ്ങളെക്കുറിച്ച് ചരിത്രപരമായ അവബോധം നേടുന്നു .</p> <p>CO2. നാടക സാഹിത്യത്തിന് ഇതര സാഹിത്യ രൂപങ്ങളിൽ നിന്നുള്ള വ്യത്യാസം തിരിച്ചറിഞ്ഞ് അതിന്റെ പ്രയോഗനൈപുണി കൈവരിക്കുന്നു</p> <p>CO3. നാടക അവതരണത്തെക്കുറിച്ചും അരങ്ങു വൈവിധ്യത്തെക്കുറിച്ചുമുള്ള ധാരണ ഉറപ്പാക്കുന്നു.</p> <p>CO4. സാമൂഹ്യ ജീവിതത്തിന്റെ പരിണാമങ്ങൾക്ക് അനുസൃതമായി മലയാള നാടകത്തിന് ഉണ്ടായ വ്യതിയാനത്തെക്കുറിച്ച് സൂക്ഷ്മ അപഗ്രഥനം നടത്തുന്നു</p>
ML1231.1	കേരളപഠനം 2	<p>CO1. കേരളത്തിലെ ഭാഷ ,സാഹിത്യം, കലാരൂപങ്ങൾ എന്നിവയുടെ വികാസത്തിന് കളമൊരുക്കിയ പശ്ചാത്തലത്തെ മനസിലാക്കുന്നു .</p> <p>CO2. സാംസ്കാരിക തനിമ തിരിച്ചറിയുന്നു .</p> <p>CO3. ദേശീയബോധം വളരുന്നതിനൊപ്പം പൗരത്വവികാസവും ലഭിക്കുന്നു</p> <p>CO4. ചരിത്രവും സംസ്കാരവും രേഖപ്പെടുത്താനുള്ള പ്രേരണ ഉണ്ടാകുന്നു.</p>
ML1311.1	Addl.Lang.III ഭാഷാവിഷയവും സർഗാത്മകതയും	<p>CO1. മലയാള ഭാഷയുടെ പ്രയോഗരീതിയെക്കുറിച്ചു മനസിലാക്കുന്നു</p> <p>CO2. തെറ്റില്ലാതെ ഭാഷ പ്രയോഗിക്കാനുള്ള നൈപുണി നേടുന്നു</p> <p>CO3. വിവർത്തനത്തിൽ പ്രായോഗിക പരിശീലനം നേടുകയും വിവർത്തനരചനകൾ നടത്തി വിലയിരുത്തുകയും ചെയ്യുന്നു</p> <p>CO4. വ്യാകരണത്തിന്റെ പ്രാഥമിക പാഠങ്ങളിൽ പ്രാഗല്ഭ്യം കരസ്ഥമാക്കുകയും സ്വയം വിലയിരുത്തുകയും ചെയ്യുന്നു.</p>
ML1321	FOUNDATION COURSE	CO1.വിവരസാങ്കേതികവിദ്യയെക്കുറിച്ചുള്ള ചിന്തകൾ മലയാളത്തിൽ



<b>3</b>		<p>വിവരസാങ്കേതിക വിദ്യയും മലയാളഭാഷാ പഠനവും</p>	<p>അവതരിപ്പിക്കുന്നതിനു കഴിയുന്നു .          CO2.ഇ - മലയാളത്തിന്റെ സാധ്യതകൾ അപഗ്രഥിക്കുന്നു .          CO3.ഭാഷാ കമ്പ്യൂട്ടിങ്ങിനെക്കുറിച്ചു വിശകലനാത്മകമായി ചിന്തിക്കുന്നു.          CO4.നവമാധ്യമങ്ങളിലെ മലയാള ഭാഷയെയും സാഹിത്യത്തെയും കുറിച്ച് മനസിലാക്കുന്നു .</p>
	ML1341	<p>സാഹിത്യ മീമാംസ പൗരസ്ത്യവും പാശ്ചാത്യവും</p>	<p>CO1.ഭാരതീയ സാഹിത്യ ദർശനത്തെ അന്വേഷിച്ചറിയുന്നു .          CO2.വിമർശനബുദ്ധി വികസിക്കുകയും സാഹിത്യ നിരൂപണങ്ങൾ എഴുതുകയും ചെയ്യുന്നു .          CO3.പാശ്ചാത്യ സാഹിത്യ ചിന്തകളെ ചരിത്രപരമായി വിശകലനം ചെയ്യുന്നു.          CO4. അപഗ്രഥന പാടവം സൂക്ഷ്മമാവുകയും സൈദ്ധാന്തികമായ കാഴ്ചപ്പാട് രൂപപ്പെടുകയും ചെയ്യുന്നു</p>
	ML1331	<p>പരിസ്ഥിതി പഠനം</p>	<p>CO1.പരിസ്ഥിതിയുടെ സംരക്ഷണത്തെക്കുറിച്ച് ജാഗ്രതയുണ്ടാകുന്നു .          CO2. അമിതമായ ചൂഷണവും കയ്യേറ്റവും കൊണ്ട് പ്രകൃതിക്ക് ഉണ്ടാകുന്ന ആഘാതത്തെപ്പറ്റി ചിന്തിക്കാനും പരിഹാരങ്ങൾ കണ്ടെത്താനും സാധിക്കുന്നു          CO3. മലയാള സാഹിത്യത്തിൽ പാരിസ്ഥിതികമായ ആശങ്കകൾ പ്രതിഫലിച്ചിരിക്കുന്നതിനെപ്പറ്റി വിലയിരുത്തുന്നു          CO4. പരിസ്ഥിതി വിഷയങ്ങളെക്കുറിച്ച് എഴുതാനും സംവാദങ്ങളിൽ ഏർപ്പെടാനും സന്നദ്ധമാകുന്നു</p>

ML1411.1	ദൃശ്യകലാ സാഹിത്യം	<p>CO1. ദൃശ്യകലകളെ വിമർശനാത്മകമായി ആസ്വദിക്കുന്നു.</p> <p>CO2. കേരളത്തിലെ ദൃശ്യകലാ സംസ്കാരത്തിന്റെ സമ്പന്നതയും വൈവിധ്യവും കണ്ടെത്തി വിവരിക്കുന്നു</p> <p>CO3. രചനയിൽ നിന്ന് പ്രയോഗത്തിലേക്കുള്ള പരിണാമത്തെക്കുറിച്ച് പരിശോധന നടത്തുന്നു</p> <p>CO4. നാടകം,തിരക്കഥ എന്നിവ രചിക്കുന്നു</p>
ML1441	ആധുനിക മലയാള കവിത	<p>CO1. ആധുനിക കവിത്രയ കവിതകൾ (കാല്പനിക കവിത ഒന്നാം ഘട്ടം മുതൽ ) മലയാള കവിതയിൽ ഉണ്ടായ ഭാഷാപരവും ഭാവുകത്വപരവുമായ പരിണാമം വിമർശനാത്മകമായി അപഗ്രഥിക്കുന്നു</p> <p>CO2. പാശ്ചാത്യ സമ്പർക്കഫലമായി കവിതയുടെ പ്രമേയത്തിലും രൂപഭാവങ്ങളിലും സംഭവിച്ച മാറ്റം സൂക്ഷ്മ പഠനവിധേയമാക്കുന്നു.</p> <p>CO3. ആധുനികാനന്തര മലയാള കവിതയിലെ ഭാഷാപരവും രചനാപരവും ഘടനാപരവുമായ സവിശേഷതകളെ സർഗ്ഗാത്മകമായി വിലയിരുത്തി പുതിയ വ്യവഹാര രൂപങ്ങൾ സൃഷ്ടിക്കുന്നു.</p> <p>CO4. കവിതയും സമൂഹവും തമ്മിലുള്ള ബന്ധങ്ങളിൽ സംഭവിച്ചുകൊണ്ടിരിക്കുന്ന സൂക്ഷ്മമായ പരിണാമങ്ങൾ വിലയിരുത്താൻ പ്രാപ്തി നേടുന്നു</p>
ML1442	നിരൂപണ സാഹിത്യം	<p>CO1. മലയാളത്തിന്റെ നിരൂപണ സാഹിത്യത്തിന്റെ ചരിത്രത്തെക്കുറിച്ച് സാമാന്യജ്ഞാനം നേടുന്നു</p> <p>CO2. സാഹിത്യ രചനകളെ നിരൂപണം ചെയ്യുന്നതിനും വിലയിരുത്തുന്നതിനുമുള്ള ശേഷി കൈവരിക്കുന്നു</p> <p>CO3. മലയാളത്തിലെ പ്രമുഖ വിമർശകരെക്കുറിച്ച് മനസ്സിലാക്കുകയും നിരൂപണ രീതികളുടെ വ്യതിരക്തത വേർതിരിച്ചറിയുകയും ചെയ്യുന്നു</p> <p>CO4. പുതിയ വിമർശന മാതൃകകൾ പരിചയപ്പെടുന്നു</p>
ML1431	ദളിത് സാഹിത്യം,	<p>CO1. വംശ ,വർഗ്ഗ ,ലിംഗ നിർണ്ണയനങ്ങളെക്കുറിച്ച് പുതിയ ധാരണകൾ രൂപപ്പെടുന്നു</p>

		സ്ത്രീവാദ സാഹിത്യം	CO2. മാനവീയതയെക്കുറിച്ചുള്ള പുതിയ അവബോധം സ്വായത്തമാക്കുന്നു CO3. ദളിത് രചനകളുടെയും വാമൊഴി വഴക്കങ്ങളുടെയും പുനർവായനയുടെ ആവശ്യകത തിരിച്ചറിയുന്നു CO4. സ്ത്രീവാദ സാഹിത്യത്തിന്റെ സൈദ്ധാന്തിക നിലപാടുകളെക്കുറിച്ച് സാമാന്യജ്ഞാനം നേടുന്നു
5	ML1541	ഭാഷാശാസ്ത്രം	CO1. ഭാഷയെ ശാസ്ത്രീയമായി അപഗ്രഥിക്കാനുള്ള കഴിവ് നേടുന്നു CO2. ഭാഷയുടെ അടിസ്ഥാന തത്വങ്ങളും ഘടനവിശേഷങ്ങളും മനസ്സിലാക്കുന്നു CO3. ഭാഷാസ്വരൂപം അപഗ്രഥിച്ച് ഭാഷാനിയമം രൂപവൽക്കരിക്കുന്നു CO4. കണ്ടെത്തിയ നിയമപദ്ധതികൾ ഭാഷയിൽ പ്രയോഗിക്കുന്നു
	ML1542	ചെറുകഥാപഠനം	CO1. ലോകകഥാസാഹിത്യത്തിന്റെ ഭാഗമായി മലയാള കഥകളെ വിലയിരുത്തുന്നു CO2. മലയാള കഥയുടെ ചരിത്രപരമായ വികാസം വിശദീകരിക്കാനും ഉദാഹരിക്കാനും സാധിക്കുന്നു CO3. മലയാള ചെറുകഥയിൽ സാമൂഹ്യ അവസ്ഥകളുടെയും സാഹിത്യ ചിന്തയുടെയും സ്വാധീനം തിരിച്ചറിഞ്ഞ് നിരൂപണാത്മകമായ രചനകൾ നിർവഹിക്കാൻ കഴിവ് നേടുന്നു CO4. അന്തർവജ്ഞാനിക പഠനങ്ങൾ ചെറുകഥ പഠനത്തിൽ പ്രയോജനപ്പെടുത്തുന്നു
	ML1543	വിവർത്തനം-സിദ്ധാന്തവും പ്രയോഗവും	CO1. വിവർത്തനം എന്ന ജ്ഞാനമേഖലയുടെ പ്രാധാന്യവും സവിശേഷതകളും അന്വേഷിച്ചറിയുന്നു CO2. വിശ്വമാനവികത എന്ന ആശയത്തെ വിവർത്തനം സാധ്യമാക്കുന്നത് എങ്ങനെയെന്ന് ഗ്രഹിക്കുന്നു CO3. വിവിധ ഭാഷകളുടെ സാംസ്കാരിക സവിശേഷതകൾ താരതമ്യം ചെയ്ത് കണ്ടെത്തുന്നു CO4. വിശ്വസാഹിത്യത്തിന്റെ വിവിധ

		മേഖലകളെ പരിചയപ്പെടുന്നു
ML1544	ജീവചരിത്രം, ആത്മകഥ, യാത്രാസാഹിത്യം	CO1. മലയാളസാഹിത്യത്തിലെ വ്യത്യസ്ത പ്രസ്ഥാനങ്ങളെ പരിചയപ്പെടുന്നു CO2. പ്രസിദ്ധരുടെ ജീവിതാനുഭവങ്ങളെ സ്വന്തം കാഴ്ചപ്പാടിൽ വിലയിരുത്തുന്നു CO3. യാത്രകൾ ആനന്ദോപാധി മാത്രമല്ല ചരിത്രവും സംസ്കാരവും മനസ്സിലാക്കാനുള്ള വഴികൾ ആണെന്നും കണ്ടെത്തുന്നു CO4. വ്യത്യസ്തജീവിതാനുഭവങ്ങളെ നിരീക്ഷിക്കുകയും ഉൾക്കൊള്ളുകയും ചെയ്യാൻ പ്രാപ്തി നേടുന്നു
ML1545	മലയാള ഭാഷ സാഹിത്യചരിത്രം- 1	CO1. മലയാളഭാഷയുടെയും സാഹിത്യത്തിന്റേയും ആരംഭകാലം മുതൽ ഇന്നോളമുള്ള വികാസപരിണാമങ്ങളെക്കുറിച്ച് സാമാന്യ അറിവുണ്ടാകുന്നു CO2. ഭാഷ സാഹിത്യദികളെ കുറിച്ചുള്ള പഠനം അതത് ജനതയുടെ സാംസ്കാരിക അന്വേഷണം കൂടിയാണെന്ന് തിരിച്ചറിയുന്നു CO3. വാമൊഴിയിലും വരമൊഴിയിലും ഉള്ള സാഹിത്യത്തിന്റേ ചരിത്ര പഠനത്തിലൂടെ വിവിധ സാഹിത്യ രൂപങ്ങളും പ്രസ്ഥാനങ്ങളും പരിചയപ്പെടുന്നു CO4. പാട്ട് ,മണിപ്രവാളം എന്നിവയ്ക്ക് ഭാഷയിലും സാഹിത്യത്തിലുമുള്ള പങ്ക് വിശകലനം ചെയ്യാൻ ശേഷി നേടുന്നു
ML1551.1	OPEN COURSE കേരളീയകലകൾ	CO1. കേരളീയ കലകളുടെ സൗന്ദര്യ ലോകത്തേക്ക് എത്തിച്ചേരുകയും ആസ്വാദനശേഷി വർദ്ധിക്കുകയും ചെയ്യുന്നു . CO2. സ്വന്തം കലാവാസനകൾ ഉണരുകയും കലാപരവും മാനസികവുമായ വികാസം നേടാൻ സാധിക്കുകയും ചെയ്യുന്നു CO3. കേരളത്തിന്റേ കലാപരമ്പരയും അവയുടെ വികാസപരിണാമങ്ങളും ഉൾക്കൊള്ളാൻ കഴിയുന്നു CO4.ഭാരതീയ കലയുടെയും പ്രാധാന്യവും തനിമയും വിലയിരുത്തുന്നു

6	ML1641	മലയാള ഭാഷാ-സാഹിത്യചരിത്രം- 2	<p>CO1. പ്രാചീന കവിത്രയത്തിനുശേഷം മലയാള കവിതയ്ക്കുണ്ടായ വ്യത്യസ്ത സരണികൾ പരിചയപ്പെടുന്നു</p> <p>CO2. പദ്യസാഹിത്യത്തിനുള്ളത് പോലെ തന്നെ വൈവിധ്യം നിറഞ്ഞ ഗദ്യ സാഹിത്യത്തിന്റേയും ചരിത്രം വിശകലനം ചെയ്യാൻ നേടുന്നു</p> <p>CO3. സാഹിത്യചരിത്ര പഠനത്തെ സർഗ്ഗാത്മകമായി പ്രയോജനപ്പെടുത്താൻ ആകുന്നു</p> <p>CO4. ആധുനിക സാഹിത്യം, ഉത്തരാധുനിക സാഹിത്യം എന്നിവയുടെ സ്വഭാവം വിലയിരുത്താനാകുന്നു</p>
	ML1642	മലയാള വ്യാകരണം	<p>CO1. മലയാളഭാഷയുടെ മഹത്തായ വ്യാകരണ പാരമ്പര്യത്തെക്കുറിച്ച് അവബോധം ഉണ്ടാകുന്നു</p> <p>CO2. മലയാളഭാഷയുടെ അടിസ്ഥാന വ്യാകരണ തത്ത്വങ്ങളിൽ വേണ്ടത്ര അവഗാഹം ഉണ്ടാകുന്നു</p> <p>CO3. ഭാഷാപ്രയോഗത്തിലെ ശരിയും തെറ്റും തിരിച്ചറിയുന്നു</p> <p>CO4. തെറ്റായ വ്യാകരണ പ്രയോഗങ്ങൾ ഒഴിവാക്കാനും ശരിയായവ പ്രയോഗിക്കാനും പ്രാപ്തി നേടുന്നു</p>
	ML1643	ആധുനിക പൂർവ്വ മലയാള കവിത	<p>CO1. മലയാളം ഒരു സാഹിത്യ ഭാഷയായി രൂപപ്പെട്ട കാലം മുതൽ പത്തൊമ്പതാം നൂറ്റാണ്ടിന്റേ അവസാനം വരെയുള്ള വ്യത്യസ്ത കാവ്യസമ്പ്രദായങ്ങളെയും ചരിത്ര ഘട്ടങ്ങളെയും പരിചയപ്പെടുന്നു.</p> <p>CO2. കാവ്യവിശകലനത്തിനും കാവ്യാസ്വാദനത്തിനും പ്രാപ്തി കൈവരുന്നു</p> <p>CO3. കാവ്യഭാഷയിൽ സംഭവിച്ച കാലാനുസൃതമായ മാറ്റങ്ങളെക്കുറിച്ചുള്ള സാമാന്യ ധാരണ ഉണ്ടാകുന്നു</p> <p>CO4. ഈ കാലയളവിലെ സമാനമായ ഏതാനും കാവ്യഭാഗങ്ങൾ വിശദമായി പഠിക്കുന്നതുവഴി ആസ്വാദന വിശകലനത്തിനുള്ള താല്പര്യം</p>

		വികസിക്കുന്നു .
ML1644	നാട്ടറിവ് പഠനം	CO1. നാട്ടറിവുകളുടെ പ്രസക്തിയെക്കുറിച്ചും ഈ ജ്ഞാന മാതൃക നിർവഹിക്കുന്ന സാമൂഹിക ധർമ്മങ്ങളെക്കുറിച്ചും അവബോധം രൂപപ്പെടുന്നു CO2. നാട്ടറിവുകളുടെ വ്യത്യസ്ത ജനുസുകളും തരഭേദങ്ങളും തരംതിരിച്ച് വിശകലനം ചെയ്യുന്നു CO3. ഫോക് ലോർ പഠനമെന്ന ബഹുവിജ്ഞാനീയ മേഖലയുടെ പശ്ചാത്തലത്തിൽ നാടൻ സാംസ്കാരിക രൂപങ്ങളെ വിമർശനാത്മകമായി അപഗ്രഥിക്കാൻ തുടങ്ങുന്നു CO4. സാഹിത്യനിർവചനങ്ങളെ നാടൻ സാഹിത്യത്തിന്റേയും വാമൊഴിക്ക പശ്ചാത്തലത്തിൽ പുനർനിർമ്മിക്കുന്നു
ML1651.2	OPEN COURSE 2 (ELECTIVE) മാധ്യമലോകം	CO1. മാധ്യമങ്ങളുടെ അനന്തസാധ്യതയുള്ള ലോകം മനസ്സിലാക്കുന്നു CO2. അച്ചടി,റേഡിയോ ടെലിവിഷൻ, നവമാധ്യമങ്ങൾ എന്നിവയുടെ ചരിത്രവും വർത്തമാന സ്ഥിതിയും തിരിച്ചറിയുന്നു CO3. മാധ്യമങ്ങളിലെ വാർത്തകളും പരിപാടികളും സൂക്ഷ്മമായി മനസ്സിലാക്കുന്നു CO4. അവതരണങ്ങളിലെ വിശ്വാസ്യതയും ഭാഷാപരമായ പ്രത്യേകതകളും വിമർശനാത്മകമായി വിലയിരുത്തുന്നു

## DEPARTMENT OF PHILOSOPHY

### B.A PHILOSOPHY

SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	PL1141	METHODOLOGY AND PERSPECTIVES OF HUMANITIES	CO1: familiarising the concepts and methodology in social science.
			CO2: foster critical perspective as well philosophical attitude.
			CO3: explore and promote research on the status,scope and challenges of language research from a global perspective.
			CO4: scope of narration in philosophy for enhancing knowledge and vision.
2	PL1241	PHILOSOPHIC THEMES AND METHODS	CO1:know about the subject matter of philosophy
			CO2:provide foundation to the learning of philosophy
			CO3:acquittance with the fundamental questions in philosophy
			CO4:familiarize the students with the major themes of philosophy

3	PL1321	INFORMATICS AND PHILOSOPHY	CO1:study the basic concepts and functional knowledge in the field of informatics
			CO2:equip the students to aware of emerging digital knowledge in society
			CO3:apply philosophical issues in the field of informatics
			CO4:know about ethical issues related to information technology
	PL1341	DEDUCTIVE LOGIC	CO1:familiarize the student to know the fundamentals of logical reasoning
			CO2:examine the science of thought and scope of logic in day today life
			CO3:know about the detailed version of fallacies involved in reasoning.
			CO4:create sharpness and critical habit in thinking process.
4	PL1441	INDUCTION AND SCIENTIFIC METHOD	CO1:study the principles and methods of correct reasoning
			CO2:introduce the different types of common errors that occur in reasoning and analyse their implications
			CO3:equip the students to write competitive exams with confidence and clarity by applying the principles of logic
			CO4:develop the argument skill of each student.



	PL1442	EARLY INDIAN PHILOSOPHY	CO1:clarify and elucidate the basic characteristics of indian philosophy
			CO2:evaluate the philosophical richness of early indian philosophy
			CO3:illustrate the basic metaphysical concepts and theories in ancient philosophical schools
			CO4:familiarize the important orthodox and heterodox schools of ancient philosophy.
5	PL1542	ORTHODOX SYSTEM OF INDIAN PHILOSOPHY	CO1:create critical and novel approaches in basic indian philosophical systems
			CO2:articulate and exemplify basic knowledge of the tradition of vedanta
			CO3:analyse the theistic and absolutistic approaches to reality.
			CO4:critically evaluate the applications of vedanta in human life.
	PL1543	INTRODUCTION TO ETHICS	CO1:develop common outlook regarding relevance of ethics
			CO2:bring out the basic features of normative ethics
			CO3:analyse various ethical theories and study their ethical implications.
CO4:form conception of rights and duties in the light of			

			philosophical explanation
	PL1544	MODERN WESTERN PHILOSOPHY	CO1: understand rationality, freedom of thought and diverse possibilities of philosophising.
			CO2: analyse the role of empirical experience in the formation of knowledge which helps to develop scientific temper.
			CO3: compare rational and empirical methods and evaluate the need of them for approaching the problem of knowledge.
			CO4: create critical perspectives on modern perspectives of knowledge and reality.
	PL1545	ANCIENT AND MEDIEVAL POLITICAL PHILOSOPHY	CO1: apply philosophy to interpret social and political problems
			CO2: demonstrate basic features of philosophical dynamics of modern Indian thinkers.
			CO3: applying dialectical method in addressing socio-political issues.
			CO4: acquaintance with the modern materialistic approach
	PL1551.1 9(OOPEN COURSE)	FUNDAMENTALS OF LOGICAL REASONING	CO1: examine the science of thought and scope of logic in our day today life
			CO2: introduce the different types of common errors that occur in reasoning and analyse their implications
			CO3: understand what is proposition and compare the

			<p>traditional and modern classification of propositions as well as apply and create logical arguments to check validity using square of opposition</p> <p>CO4:develop the argument skill of each student.</p>
	PL1641	SYMBOLIC LOGIC	<p>CO1:explore the historical developments of symbolic logic</p> <p>CO2:provide the knowledge of the symbolization of logic which is used for computer application</p> <p>CO3:understand symbolic representation of statements which helps better understanding than verbal representation</p> <p>CO4: understand the advantages of using rules and figures in symbolic logic.</p>
	PL1642	APPLIED ETHICS	<p>CO1:identify the problems of bioethics and problems of ethics</p> <p>CO2:know about the emergence of applied ethics as an important part of ethics.</p> <p>CO3:introduces the different aspects of the general issues in professional ethics and cyber ethics.</p> <p>CO4:introduce bioethical problems related to medical ethics,media ethics and ethics of technology</p> <p>CO4:introduce bioethical problems related to medical ethics,media ethics and ethics of technology</p>

	PL 1643	RECENT TRENDS IN WESTERN PHILOSOPHY	CO1:articulate and exemplify the basic knowledge of phenomenology,existentialism
			CO2:apply existentialistic approach to one's own life experiences.
			CO3:develop the capacity to interpret texts.
			CO4:evaluate how far the language can reflect reality.
	PL 1644	MODERN POLITICAL PHILOSOPHY	CO1:understand the basic social concepts and political ideals
			CO2:apply marx's philosophy to explain inequality in society
			CO3:understand and analyse hobbes,locke,rousseau's theory of social contract
			CO4:evaluate rawls notion of justice as fairness and nozick's defence of free market libertarianism
	PL 1661	PHILOSOPHY AND SELF MANAGEMENT	CO1:create an awareness on the integrity of values in human life
			CO2:understand the significance of philosophy in day today life
			CO3:inculcating philosophical ideals in ones life
			CO4:evaluate philosophical richness of indian philosophy on self management

## DEPARTMENT OF PHYSICS

### B.Sc. PHYSICS

SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	PY1141	BASIC MECHANICS & PROPERTIES OF MATTER	CO1: Develop knowledge and understanding of the historical development of mechanics, some implications of the principle of mechanics and the scope of mechanics.
			CO2: Apply knowledge of the dynamics of rigid bodies, conservation of energy, oscillations, waves and mechanical properties of matter such as elasticity, fluid dynamics and surface tension to explain natural physical processes and related technological advances.
			CO3: Use an understanding of elementary mathematics along with physical principles to effectively solve problems encountered in everyday life and, apply that in the advanced and further study in science.
			CO3: Work on the experimental design and studies on project topics such as Young's modulus for different types of wood, variation of surface tension for different detergents, viscosity of different types of ink and to arrive at knowledge of its fluidity, wide applications of Bernoulli's equation and variation of surface tension with temperature by Jaeger's method.
			CO4: Understand the contributions of eminent physicists- Newton, Einstein, C. V. Raman, Edison in the development of physics in its historical and cultural context.
2	PY1241	HEAT AND THERMODYNAMICS	CO1: Develop knowledge of the laws of thermal conductivity and thermodynamics, and understand its implications. CO2: Introduce applications of thermodynamics to heat engines such as Carnot engine, Otto engine and Diesel

			engine and the principle of refrigerator.
			CO3:Develop an appreciation of the concepts of order, disorder and entropy and an understanding of the heat as an energy.
3	PY 1341	ELECTRODYNA MICS	CO1:This course provides an advanced knowledge in understanding the principles and the dynamic as well as the static phenomena of electromagnetism.
			CO2:Students will be in a position to make a mathematical description of electromagnetic phenomena based on basic physical quantities through the fundamental equations of electromagnetism (Maxwell equations).
			CO3:Students must be able to solve electrodynamics problems using the fundamental equations through advanced mathematical steps tools like vector calculus.
			CO4:Students must be engaged to draw qualitative and quantitative conclusions about bound charges, alternating and transient currents, electromotive force, storage of electrostatic energy in a field, magnetic vector potential, electrostatic potential etc., by managing a number of physical concepts and laws such as Gauss's law, Ampere's circuital law, Faraday's law etc. and its applications.
			CO5:Study in depth the transient current response of LR, CR and LCR circuits and the alternating current response of LCR series, and parallel circuits, which are essential in designing as well as understanding the working of electronic circuits.
			CO6:This course equips the students with the necessary mathematical knowledge for a detailed and accurate description of phenomena such as polarization, magnetism in materials, magnetic flux, magnetic torque, magnetic charge, electromagnetic induction, propagation of electromagnetic waves in vacuum etc., and for solving related problems.

4	PY 1441	CLASSICAL AND RELATIVISTIC MECHANICS	CO1:Students who completed this course should have deep understanding and working knowledge in the concepts of Newtonian mechanics, Lagrangian dynamics, Hamiltonian mechanics, Lorentz transformations and special theory of relativity.
			CO2:Students should be able to understand phenomena of length contraction, time dilation, twin paradox and mass-energy equivalence.
			CO3:Students can be able to apply their classical mechanical understanding to a variety of dynamical simple configurations and systems for solving its problems.
			CO4:Students must be in a position to equip with the necessary mathematical concepts to be able to solve relativistic problems.
PY1442	BASIC PHYSICS LAB 1	CO1:Be able to perform basic experiments in physics and measure results on properties of matter, dynamics of rigid body, heat, thermodynamics, electricity and magnetism.	
		CO2:Be able to develop and experience a deep understanding of theories that they have learned from the Plus-Two classes and from the first two semesters of the Physics degree theory courses.	
5	PY1541	QUANTUM MECHANICS	CO1:Have a deep understanding of the limitations of classical physics and the emergence, and the mathematical foundations of quantum mechanics.
			CO2: Be able to solve the Schrödinger equation for simple configurations such as square-well potential with infinite walls, square well potential with finite walls, square potential barrier and the Harmonic oscillator.
			CO3: Understand that quantum mechanics is a mathematical model the solutions of which yield wave functions and energies.
			CO4: Understand the general formalism of quantum mechanics.

	PY1542	STATISTICAL PHYSICS, RESEARCH METHODOLOGY AND DISASTER MANAGEMENT	CO1:Have fundamental knowledge on physical statistics and be able to solve statistical mechanics problems for simple systems
			CO2:Be able to perform basic experiments in physics and to perform a statistical and systematic analysis of experimental data.
			CO3:Be able to write the results of an experiment in the style of a scientific paper.
			CO4:Have a feel of what it means to do independent research.
			CO5:Disaster management study will be able to equip the students a deep awareness about natural disasters and natural hazards like climate change, earthquake, tsunami, flood, radiation emergencies etc., and their effects like health emergencies, relief efforts, prevention and future development.
			CO6:Upon the completion of Disaster Management course, the students will be able to take actions for emergency response when disasters occur, prepare others to resolve the problems for disasters by imparting the acquired knowledge and skills to protect and improve the lives of people in the society.
	PY1543	ELECTRONICS	CO1: Understand the basic circuit theorems and apply them to solve circuit problems of series, parallel and cascade connections.
			CO2:Be able to understand the current-voltage characteristics of a PN junction diode, Zener diode and bipolar junction transistor, their constructions using different circuit configurations and analyze its operations and working in different electronic circuits and their applications.
			CO3:Know about the working of different types of power amplifiers.



			CO4: Know the concepts of feedback principles and Barkhausen criterion for oscillations. * Design and analyze the RC phase shift, Hartley Oscillator, Colpitt's oscillator circuits to determine the frequency of oscillations.
			CO5: Understand the fundamentals of AM and FM modulations, and demodulations.
			CO6: Design and analyze the basic operations of MOSFET and UJT.
			CO7: Understand the fundamentals of operational amplifiers.
			CO8: Design, construct, analyze and differentiate the operations of different configurations of operational amplifiers.
			CO1: Be familiar with the phenomena in several areas atomic and molecular physics.
			CO2: Understand the interaction between atoms, molecules and electromagnetic fields.
PY1544	ATOMIC & MOLECULAR PHYSICS		CO3: Be able to account for the effect of nucleus on the electron structure including concepts like mass dependency, and hyperfine structure.
			CO4: Know the effect external electric and magnetic fields on atoms.
			CO5: List the properties of X-rays, and explain the fundamentals of X-ray diffraction and X-ray absorption spectroscopy.
			CO6: Explain the basic principles of molecular rotational, vibrational and electronic spectroscopies.
			CO7: Know the fundamental principles of NMR, ESR and Mossbauer spectroscopies and be able to outline the

			applications of resonance spectroscopies.
			CO8:Perform quantitative calculations based on the relationship between wavelength, energy, speed of light, and the other optical and spectroscopic terms for atomic and molecular properties.
	PY1551.5	ENERGY PHYSICS (OPEN COURSE)	CO1:Have a good understanding of various energy systems, related energy technologies, their availability, merits, and demerits in relation to natural and human aspects of the environment and energy applications.
			CO2:Have profound and specialized knowledge in solar, wind, biomass, tidal, wave and chemical energies.
			CO3:Know the effective energy management, energy storage, energy crisis and possible solutions.
			CO4:Be able to suggest and design energy options for the developing countries.
			CO5:Understand the impact due to non-conventional energy sources like global warming.
CO6:Gain a solid foundation for developing the use of renewable and conventional energy systems in society.			
6	PY 1641	SOLID STATE PHYSICS	CO1:Know how to explain the fundamental features of crystalline solids, metallic conduction through free electron model, Properties of insulators and semiconductors, band theory of solids, dielectric and magnetic properties of materials.
			CO2:Understand the physics underlying superconductivity and its applications.
			CO3:Be familiar with the basic theoretical and conceptual models in solid state physics such as Miller indices, reciprocal lattice, Brillouin Zones, Bragg's law, Fermi surface, Hall effect, magneto resistance, AC conductivity, Bloch theorem, Kronig-Penney model, Langevin theory, Clausius Mosotti Equation, Cauchy and Sellmeir relations, Langevin-Debye equation, Plasmons, Curie's law, Weiss's

			theory, Hysteresis curve, London's equation and penetration depth, isotope effect, BCS theory, tunnelling and Josephson effect etc.
			CO4:Acquire the capability of elementary problem solving in solid state physics, relating theoretical prediction and analyzing the results.
			CO5:Gain basic knowledge of solid state physics so as to build a foundation for further study of solid state systems and their application in electronic devices and modern technologies in material sciences.
			CO6:Be able to outline the relevance of solid state physics in the modern society.
PY 1642	NUCLEAR AND PARTICLE PHYSICS	CO1: Understand and explain the general properties of nuclei, nuclear structure and nuclear models.	
		CO2:Explain different forms of radioactivity and account for their occurrence.	
		CO3:Account for the nuclear fission and fusion processes.	
		CO4:Understand elementary nuclear particles, and their families, symmetries and conservation laws.	
		CO5: Know and understand various elementary particle interactions and their basic features, and interrelations.	
		CO6:Classify elementary particles according to their Baryon, Lepton, isospin, strangeness and charm numbers.	
		CO7: Master the knowledge of particle detectors and accelerators.	
		CO8: Acquire the capability of elementary problem solving in nuclear and particle physics.	
PY1643	CLASSICAL AND MODERN OPTICS	CO1: Develop basic knowledge of physics behind interference, diffraction, polarization and dispersion.	
		CO2: Understand the fundamentals of modern optics like lasers, Fiber optics and holography.	

			CO3: Solve problems in optics by selecting the appropriate equations and performing numerical or analytical calculations.
	PY1644	DIGITAL ELECTRONICS AND COMPUTER SCIENCE	CO1: Understand different number systems, and their mutual conversions as well as the arithmetic operations, digital codes, logic gates, Boolean laws, D' Morgan's theorem and Karnaugh map.
			CO2: Analyze, Design and implement combinational logic gate circuits.
			CO3: Be able to explain Boolean expressions for different logic gate circuits and simplify various Boolean expressions for different inputs using the Boolean algebra and with Karnaugh Map.
			CO4: Explain principle of operations for various arithmetic and sequential electronic circuits.
			CO5: Understand the basic components, and operational concepts of computers as well as the basic concepts, and the role of memory systems in computers.
			CO6: Have deep knowledge in the C++ programming language.
			CO7: Develop programming skills for solving problems in Physics using C++.
			CO8: Understand the fundamentals of microprocessors and microcontrollers.
			CO9: Draw and describe the basic architecture of 8085 microprocessor.
PY1661.5	COMPUTER HARDWARE & NETWORKING (ELECTIVE COURSE)	CO1: Have ideas of architecture and functions of computer and enhance their acquired knowledge on processor, motherboard, memory, chipsets, buses and add on cards, etc.	
		CO2: Have deep understanding about the operations of computer peripherals such as keyboard, mouse, VDU, printer, scanner, SMPS, UPS etc., and the working of	

			computer drivers.
			CO3: Have knowledge about Computer viruses and vaccines.
			CO4: Be familiar with the essentials of networking, protocols, wireless and mobile technologies.
			CO5: Develop knowledge and skills necessary to gain employment as computer network administrator.
PY1645	ADVANCED PHYSICS LAB 2	CO1: Effectively engage in advanced experiments using spectrometer, potentiometer, Carey-Foster's bridge, circular coil, Searle's vibration magnetometer etc.	
		CO2: Critically evaluate and analyze the results of the experimental measurements.	
		CO3: Design and practice related experiments and acquire data in order to explore physical principles in optics, electricity and magnetism, effectively communicate results, and critically evaluate related scientific studies.	
PY1646	ADVANCED PHYSICS LAB 3	CO1: Effectively engage in electronics experiments using PN junction diode, Zener diode, transistor and integrated circuits and execute computer programs in physical science problems.	
		CO2: Critically evaluate and analyze the results of the experimental measurements.	
		CO3: Design and practice related experiments and acquire data in order to explore electronic principles, effectively communicate results, and critically evaluate related scientific studies.	
PY1647	PROJECT	CO1: Students can get an introduction to research methodology.	
		CO2: Bring out the talents of students in experimental, theoretical or computational researches.	

			CO3:Students can maintain novelty in approaching any research problem through their first-hand experiences.
			CO4:Adapting to new situations.
			CO5:Students can develop their oral and verbal presentation skills.
			CO6: Participate in decision-making process.
			CO7:Students get an opportunity to communicate with experts in the project/research field so as to share, and clarify their doubts and to seek their opinions and advices.
			CO8:Search for, analysis and synthesis of data and information, with the use of the necessary technology.
			CO9:Motivated students can expand and develop their future research field.

COMPLEMENTARY COURSES OF PHYSICS			
SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
CHEMISTRY			
1	PY1131.	ROTATIONAL DYNAMICS AND PROPERTIES OF MATTER	CO1: Apply knowledge of the dynamics of rigid bodies, oscillations, waves and properties of matter such as bending moment, elasticity, viscosity and surface tension to explain natural physical processes and related technological advances.
			CO2: Use an understanding of elementary mathematics along with physical principles to effectively solve problems encountered in everyday life and, apply that in the advanced and further study in science.
			CO3: Do hands-on-experiments in topics such as Young's modulus for different types of wood, rigidity modulus of wires, surface tension of liquids, variation of surface tension with temperature by Jaeger's method, viscosity of different types of liquids and to arrive at knowledge of its fluid
	PY1231.2	THERMAL	Co1: Understand what diffusion is and be able to estimate

2		PHYSICS	concentrations and coefficient of diffusivity.
			Co2: Know what black body is, how energy is distributed in black body radiation spectrum and be able to estimate the solar constant and temperature of the sun.
			Co3: Understand the concept of entropy, and disorder and have a clear understanding about the changes irreversible and irreversible cycles
			Co4: Solve problems in thermal physics and statistical mechanics by selecting appropriate equations
3	PY1331.2	OPTICS, MAGNETISM AND ELECTRICITY	Co1: Develop basic knowledge of the physics behind interference, diffraction and polarization
			Co2: Be able to outline the important applications of lasers and optical fibres in the modern society.
			Co3: Be able to define magnetism and magnetic properties of matter, including diamagnetism, paramagnetism, ferromagnetism and antiferromagnetism, derive the relation between magnetic vectors and explain the electron theory of magnetism.
			Co4: Study in depth the alternating current response of RC, LC, LR and LCR series circuits, which is essential in understanding the working of electronic circuits.
4	PY1431.2	ATOMIC PHYSICS, QUANTUM MECHANICS AND ELECTRONICS	Co1: Have a deep understanding of models in atomic physics such as Bohr atom model and vector atom model.
			Co2: Have knowledge about the limitations of classical physics and hence be aware how quantum theory emerged.
			Co3: Understand the properties and significance of wavefunction and define probability density
			Co4: Be able to understand the current-voltage characteristics of a P-N junction diode, Zener diode and bipolar junction transistor, their constructions using different circuit configurations and analyze its operations and working in different electronic circuits.
	PY1432	PRACTICAL	CO1: Be able to perform basic hands-on experiments in some areas physics about optics, electricity, magnetism, rigid body dynamics, properties of matter, heat and thermodynamics, electronics and digital electronics, and to analyze the measured results for arriving at valid conclusions so as the students develop an in depth understanding of theories what they have learned from the classrooms and other knowledge resources.

			CO2: Acquire the capability for suggesting alternate experimental methods for verifying the theories
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<b>M.Sc. PHYSICS</b>			
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SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
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1	PH211	CLASSICAL MECHANICS	CO1: Students are able to learn the concepts of Lagrangian and Hamiltonian mechanics and use them to solve problems in mechanics. Able to learn concepts of generating functions, Poisson brackets Hamilton Jacobi equations and action angle variables.
			CO2: To equip the students to deal with central force problem and analyzing Kepler's laws.
			CO3: To inculcate the students the concepts of special and general theory of relativity and related problems.
			CO4: To acquaint the students about the theory of small oscillations and Euler's equations of motions of rigid bodies.
			CO5: To analyze nonlinear dynamical systems and to explain the concepts of classical chaos.
	PH212	MATHEMATICAL PHYSICS	CO1: To apply and analyze the various vector and matrix operations and to perform complex analysis for solving physical problems.
			CO2: To demonstrate and utilize the concepts of Fourier series and its transforms.
			CO3: To explain and differentiate different probabilistic distributions.
			CO4: To apply partial differential equations and special functions for solving mathematical problems.
			CO5: To illustrate and apply concepts of group theoretical operations and tensors.



	PH213	BASIC ELECTRONICS	CO1:To equip the students to design and analyze different analogue and digital circuits.
			CO2:To summarize the knowledge of basic arithmetic and data processing circuits and memory devices.
			CO3:To equip the students to explain various components in optical communications systems and microwave devices.
			CO4:To measure and analyze the different electronic signals.
2	PH221	MODERN OPTICS AND ELECTROMAGNETIC THEORY	CO1:To demonstrate the linear and nonlinear optical phenomena.
			CO2:To explain and discuss propagation of electromagnetic waves through different media.
			CO3:To restate formulations and relativistic effects in electrodynamics.
			CO4:To analyze the propagation of electromagnetic waves through waveguides.
			CO5:To use radiation theory in developing different antennas.
	PH222	THERMODYNAMICS, STATISTICAL PHYSICS AND BASIC QUANTUM MECHANICS	CO1:To explain the basic thermodynamic relations, Maxwell's equations and its consequences.
			CO2:To equip the students to demonstrate and apply classical and quantum statistics in different physical phenomena.
			CO3:To distinguish the different phase transitions using Ising model.
			CO4:Outline and apply foundations of quantum mechanics.

	PH223	COMPUTER SCIENCE AND NUMERICAL TECHNIQUES	CO1:To summarize computer hardware and its operating systems	
			CO2:Explain internal architecture of microprocessors 8085 and create assembly language programing.	
			CO3:To develop and compile programs in python and C++.	
			CO4:Apply numerical methods to solve physical problems.	
	PH251	GENERAL PHYSICS PRACTICALS	CO1: To measure and analyze various physical quantities.	
			CO2: To calculate error in various general physics experiments.	
			CO3:To develop experimental skills	
	PH252	ELECTRONIC S AND COMPUTER SCIENCE PRACTICALS	CO1:To design and construct various electronic circuits and its validation.	
			CO2:To calculate error in various electronics experiments.	
			CO3:To develop experimental and programming skills	
	3	PH231	ADVANCED QUANTUM MECHANICS	CO1:To extend the use of approximation methods viz variation, WKB, time dependent and time independent perturbations.
				CO2:To summarize different types of symmetry, conservation laws and quantum theory of scattering.
CO3:To distinguish different approximation methods, to study the structure and properties of many electron systems.				
CO4:To compute eigen values of angular momentum and evaluation of CG coefficients CO5:Infer the requirements of relativistic quantum mechanics.				
PH232		ATOMIC AND MOLECULAR SPECTROSCO	CO1: Explain different symmetry operations and deduction of molecular structure.	

		PY	CO2:Distinguish and classify the different spectra shown by atoms and molecules
			CO3: Illustrate the various spectroscopic experimental techniques.
	PH233	ADVANCED ELECTRONIC S-I	CO1: To summarize various techniques of digital and analog communication systems.
			CO2: Generalize the idea of information theory.
4	PH241	CONDENSED MATTER PHYSICS	CO1:Discuss crystal physics, lattice vibrations, models of thermal properties and band theory of solids
			CO2:Explain the theoretical concepts of semiconductors, dielectric, magnetic and superconducting materials
			CO3:To describe the synthesis and characterization techniques of nanomaterials.
			CO4:To apply the concepts in condensed matter physics to meet the challenges.
PH242	NUCLEAR AND PARTICLE PHYSICS	CO1:To describe and analyze nuclear structure, models and reactions.	
		CO2: To illustrate the mechanisms of nuclear fission and fusion reactions.	
		CO3: Discuss various nuclear detectors and particle accelerators.	
		CO4: To classify elementary particles and discuss their interactions.	
PH243 E	ADVANCED ELECTRONIC S - II	CO1: Demonstrate microprocessor architecture, programing and interfacing devices.	
		CO2: Outline the basic concepts of embedded systems, artificial intelligence and neural networks.	
		CO3: Illustrate fundamental data communications codes, radar and satellite communication systems.	

	PH243 E	ADVANCED ELECTRONIC S - II	CO1: Demonstrate microprocessor architecture, programing and interfacing devices.
			CO2: Outline the basic concepts of embedded systems, artificial intelligence and neural networks.
			CO3: Illustrate fundamental data communications codes, radar and satellite communication systems
	PH261	ADVANCED PHYSICS PRACTICALS	CO1: To measure and analyze various physical quantities.
			CO2: To calculate error in various advanced physics experiments.
			CO3: To develop experimental skills
			CO4: To analyze and point out results of experimental data.
	PH262E	ADVANCED ELECTRONIC PRACTICALS	CO1: To design and construct various electronic circuits and its validation.
			CO2: To calculate error in various electronics experiments.
			CO3: To develop and test assembly language programs using microprocessors
	PH201	PROJECT	CO1: To familiar with various fields of research in physics
			CO2: To carry out advanced tasks
			CO3: To learn and make use of new information
			CO4: To develop scientific competence
	PH 202	General Viva Voce	CO1: To develop self confidence
CO2: To equip the students to gain and improve knowledge through self-thinking			
CO3: To develop ability to handle questions,			

			professionalism, body language and the right way of response.
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<b>DEPARTMENT OF POLITICAL SCIENCE</b>			
<b>B.A POLITICAL SCIENCE</b>			
<b>SEMESTER</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>	<b>COURSE OUTCOMES</b>
1	PS1141		CO1: This paper gives basic information about research activity and a broader perspective of the social world. It prepares the learner for higher learning and research.
		METHODOLOGY AND PERSPECTIVES OF SOCIAL SCIENCES	CO2: To learn to apply the methods and theories of social science to contemporary issues.
			CO3: Critically read popular and periodical literature from a social science perspective.
2	PS1241	INTRODUCTION TO POLITICAL THEORY.	CO1: Introduction to Political Theory introduces the students to political theories which gives a philosophical perspective of the key concepts in political science such as power, sovereignty, state, justice etc.
			CO2: To introduce the students Political theory and the basic concepts
3	PS 1321	CYBER POLITICS	CO1: Cyber Politics, a foundation course in semester 3 offers a broad perspective on cyber space and the politics involved in it. The paper introduces the students to information communication Technology (ICT) and inculcates into them the importance of ICT in governance and development.

			CO2: To make the student understand the importance of democratization of Cyber Space and its security issues
	PS 1341	INDIAN CONSTITUTION	CO1: Another core course in semester 3, "Indian Constitution" imparts knowledge about the legal and ideological framework of Indian Constitution. It gives an insight into the rights and privileges of the people. CO2: To create awareness about the political processes and the actual functioning of the political system.
4	PS 1441	DYNAMICS OF INDIAN POLITICS	CO1: Dynamics of Indian Politics in semester 4 imparts knowledge about the actual working of Indian Polity. It motivates the students to critically study the functioning of the constitution. CO2: To motivate the students to critically study the functioning of the constitution.
	PS 1442	INTRODUCTION TO COMPARATIVE POLITICS	CO1: The course intends to highlight the theoretical evolution and approaches to the study of Comparative Politics. CO2: To familiarize the students basic features about the constitutions of major political systems.
5	PS 1541	PUBLIC ADMINISTRATION	CO1: Another important paper is Public Administration in semester 5. The paper provides awareness about important concepts in public administration like organization, personnel administration and financial administration. CO2: To impart knowledge about Planning and its machinery.
	PS 1542	ANCIENT AND MEDIEVAL	CO1: To study about the relevance of ancient and modern political thought in the modern world.

		POLITICAL THOUGHT	CO2: To familiarize the Ideas of ancient and medieval political thinkers.
	PS 1543	INTERNATIONAL RELATIONS	CO1: The course seeks to equip the students with the basic concepts, theories, ideologies and approaches to the study of International Relations.] CO2: To familiarize the changing nature of power relations.
	PS 1544	RESEARCH METHODS IN POLITICAL SCIENCE	CO1 :The course trying to familiarize the students with the research methods in Political Science CO2: To identify the different methods and techniques applicable to Political Science Research. CO3: To enable for the practical use of students in their Project/Dissertation in the Sixth Semester.
	PS 1545	HUMAN RIGHTS IN INDIA	CO1: The course is intended to high light the concept of Human Rights, its evolution and importance in our society. CO2 :To make an understand about various rights, including political, civil, social, economic and cultural rights
	6	PS 1641	MODERN POLITICAL THOUGHT
	PS 1642	STATE AND SOCIETY IN KERALA	CO1: The course seeks to provide a comprehensive analysis of the socio-political structure of Kerala. CO2 : To make a detailed analysis of the socio-political evolution of the state of Kerala
	PS : 1643	DECENTRALISATION AND PARTICIPATORY	CO1: The course intends to provide a detailed understanding about democratic decentralization, participatory governance with emphasis on India and Kerala.

		DEMOCRACY	CO2: To inculcate skills for capacity building activities in local self-governing institutions.
	PS 1644	NEW SOCIAL MOVEMENTS	CO1: The course intended to offer a broad perspective on power and resistance in the era of neoliberal globalization. CO2 :To equip the students to understand the dynamics of social conflicts, activism and social change
	PS 1651.2	INTRODUCTION TO PUBLIC POLICY ANALYSIS	CO1: To equip students to find solutions to practical problems which are brought to the agenda of government. CO2: To familiarize the actual situations of Public Policy formulation. CO 35: To create awareness about the determinates of public policy.
	PS 1645	PROJECT /DISSERTATION	CO 1:To inculcate proficiency to identify appropriate research topics and presentation. CO 2 :To develop an aptitude for research in Political Science

### COMPLEMENTARY COURSES FOR ECONOMICS ,BA HISTORY AND PHILOSOPHY

SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	PS 1131	INTRODUCTION TO POLITICAL SCIENCE	CO1: The course to intend to familiarize the students with the fundamental Principles of Political Science.
			CO2 : To understand the major principles of Political Science
2	PS 1231	INDIAN GOVERNMENT AND POLITICS	CO1: To impart knowledge about the functioning of the constitution of India.
			CO2:To study the basic principles of the Indian constitution



3	PS 1331	PUBLIC ADMINISTRAT ION	CO1 :The course is intended to create an understanding of the basic elements of Public Administration.
			CO2:To equip the students with some theoretical understanding about Public Administration.
4	PS 1431	INTERNATION AL POLITICS OFFERING OPEN COURSE -	CO1:The course seeks to equip the students with the basic concepts, theories, ideologies, and approaches in the study of International Politics
5	PS 1551.2	HUMAN RIGHTS IN INDIA	CO1: To familiarize the concept of Human Rights and impart awareness about the Human Rights conditions in India.
			CO2 :To make awareness about the Rights of socially excluded people

## DEPARTMENT OF ZOOLOGY

### B.Sc. ZOOLOGY

SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	ZO1141	ANIMAL DIVERSITY I	CO1: Students acquired basic knowledge about Systematics and hierarchy of different categories.
			CO2: Students learned the diagnostic characters of different phyla through examples.
			CO3: Students get familiarized with economically important fauna.
			CO4: They get a basic knowledge about Crop diseases related with their pests and their control measures.
2	ZO1241	ANIMAL DIVERSITY II	CO1: Understand the general characteristics and classification of different classes of vertebrates.
			CO2: Students get familiarized with vertebrate evolutionary tree.
			CO3: Impart general aspects of applied interest in relation to vertebrates.
			CO4: Procure knowledge about adaptations of vertebrates.
3	ZO1341	EXPERIMENTAL ZOOLOGY, INSTRUMENTATION, BIOSTATISTICS & BIOINFORMATICS	CO1: Students learned about the fundamental characteristics of science as a human enterprise.
			CO2: Understand how science works through the application of Instruments
			CO3: Apply Scientific methods independently.
			CO4: Students developed an aptitude for the use of statistical Bioinformatics tools

4	ZO1441	ECOLOGY, HABITAT DESTRUCTION & DISASTER MANAGEMENT	CO1: Impart basic knowledge on ecosystem and their functioning.
			CO2: Students acquired general awareness about pollution and their impacts.
			CO3: Gain awareness of toxicants, their impacts on human health and environment and remedial measures.
			CO4: Understand the prevention and mitigation measures of disasters.
	ZO1442	PRACTICAL I - INSTRUMENT ATION, ANIMAL DIVERSITY I & ANIMAL DIVERSITY II	CO1: Students learned Anatomy by simple dissections and mounting on permitted species.
			CO2: They get familiarized with various organ systems by examining approved animals.
			CO3: Students become familiar with economically important species.
			CO4: Strengthen what students studied in theory by giving them an opportunity to have firsthand experience in lab as well as outside.
5	ZO1541	CELL AND MOLECULAR BIOLOGY	CO1: Acquire sufficient knowledge on the fundamental structure, function and biochemistry of the cell.
			CO2: Understand the fundamental differences between prokaryotic and eukaryotic cells.
			CO3: Understand the mechanism of gene expression and gene regulation.
			CO4: scientific knowledge on cancer and ageing.
	ZO 1542	GENETICS AND BIOTECHNOL OGY	CO1: Students get educated on the underlying genetic mechanism operating in human and state of the art of bio- techniques.
			CO2: Understand the mechanism of crossing over and inheritance patterns in human.
			3. CO3: Become aware of different genetic syndromes

			and the possible ways to reduce its occurrence.
			CO4: Understand the principles and techniques involved in DNA technology and get an overview of modern techniques like PCR, Hybridoma technology, gene therapy and human cloning.
	ZO 1543	IMMUNOLOGY AND MICROBIOLOGY	CO1: Students understand the scope and importance of clinical immunology
			CO2: Procure knowledge on transplantation, mechanism of Graft retention and rejection
			CO3: Develop a broad understanding of the positive as well as negative aspects of microbes.
			CO4: Economic importance of microbes in industry can be studied.
	ZO 1551.1	OPEN COURSE: PUBLIC HEALTH AND HYGIENE	CO1: Aware about the essentials of public health and sanitation thereby warding off diseases and uplifting the living standards of the community.
			CO2: Understand the principles of nutrition and dietetics.
			CO3: Realize the ill effects of modern lifestyle.
			CO4: Procure the knowledge on the advantages of personal hygiene and sanitation.
6	ZO1641	PHYSIOLOGY AND BIOCHEMISTRY	CO1: Students develop a clear understanding of the correlation and coordination between the structure and function of different organs and organ systems of the body.
			CO2: Understand the possible causes of abnormal physiology and the resultant diseases.
			CO3: Understand the structure and functions of biomolecules and their role in metabolism.
			CO4: This course opens a new area of research to students.
	ZO 1642	DEVELOPMENTAL BIOLOGY	CO1: Students get a brief idea about the history of developmental biology.

	AND EXPERIMENT AL EMBRYOLOGY	CO2: Provide the students a bird's eye view of sophisticated embryological techniques.
		CO3: understand the various stages involved in the development of organisms.
		CO4: Procure information on different control mechanisms of development including gene actions.
ZO 1643	ETHOLOGY, EVOLUTION AND ZOOGEOGRAP HY	CO1: understand the physiological basis of behavior.
		CO2: To get knowledge on different types of communication system among animals.
		CO3: Acquire knowledge on organic evolution.
		CO4: Procure knowledge on the distribution of animals in the biosphere.
ZO 1644	PRACTICAL II- CELL BIOLOGY, GENETICS, BIOINFORMA TICS, BIOTECHNOL OGY, IMMUNOLOG Y AND MICROBIOLO GY.	CO1: Expertise the student to carry out routine hematological and microbiological techniques.
		CO2: Students get an idea about chromosomal arrangements during cell division.
		CO3: Learned chromosomal aberrations in man
		CO4: Gained broad knowledge on conventional biotechnological procedures.
ZO 1645	PRACTICAL III- PHYSIOLOGY AND BIOLOGICAL CHEMISTRY, MOLECULAR	CO1: Understand basic principles in physiology.
		CO2: Learned clinical procedures for blood and urine analysis.
		CO3: Make the student skillful in simple biochemical

	BIOLOGY AND BIOSTATISTICS.	laboratory procedures.
		CO4: Develop skill for analyzing the data by using statistical tools.
ZO1646	PRACTICAL IV- DEVELOPMENTAL BIOLOGY, ECOLOGY, ETHOLOGY, EVOLUTION AND ZOOGEOGRAPHY	CO1: Develop practical skills in the concerned subject
		CO2: able to relate scientific knowledge with life
		CO3: gain application level knowledge of procedural practices
		CO4: Attain a basic knowledge about zoological realms.
ZO 1651.2	ZOOLOGY ELECTIVE SUBJECT: ORNAMENTAL FRESH WATER FISH PRODUCTION	CO1: Aware about self-employment and self-reliance.
		CO2: Learn the scientific method of setting an aquarium.
		CO3: Aware the vast potentials involved in ornamental fish farming and trading.
		CO4: Procure the knowledge on breeding and marketing techniques of common indigenous ornamental fishes.
ZO 1647	ZOOLOGY PROJECT AND FIELD STUDY	CO1: able to get observation skill.
		CO2: Develop an aptitude for research in Zoology.
		CO3: Proficient in identifying appropriate research topic and presentation.
		CO4: Attain a basic knowledge on the research institutions and their programmes through the direct visit.

## COMPLEMENTARY COURSE OF B.Sc. ZOOLOGY

SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	ZO 1131	COMPLEMENTARY COURSE 1	CO1: Get a concrete idea of the evolution, hierarchy and classification of invertebrate phyla.
		ANIMAL DIVERSITY 1	CO2: Understand the basics of systematics by learning of the diagnostic and general characters of various groups.
			CO3: Getting an overview of typical examples in each phyla.
			CO4: Understand and study the economic importance of invertebrates with special reference with insect pests.
2	ZO 1231	COMPLEMENTARY COURSE II	CO1: Learn the evolution, hierarchy and classification of different classes of chordates.
		ANIMAL DIVERSITY II	CO2: Get an overview of the morphology and physiology of typical examples.
			CO3: Learn the bionomics of vertebrates.
			CO4: Study the adaptations and economic importance of specific vertebrates.
3	ZO 1331	COMPLEMENTARY COURSE III FUNCTIONAL ZOOLOGY	CO1: Understand the structure and function of each systems in the human body.
			CO2: Familiar with the etiology of common physiological disorders, syndromes and diseases.
			CO3: Understand the physiology of their own body and urge them to take safety measures of their health.
			CO4: Study and understand the mechanism of immune system of their body.
4	ZO 1431	COMPLEMENTARY COURSE IV	CO1: Understand the basic principles involved in the culture and breeding of common, edible and ornamental fishes of Kerala and the art of aquarium keeping.

		APPLIED ZOOLOGY	CO2: Understand chromosomal aberrations in man.
			CO3: Get a basic understanding of human genomics and reproductive biology including stem cell research and prenatal diagnostic techniques
			CO4: Understand the methodology and perspectives of applied branches of zoology and educating the possibilities of self-employment.
5	ZO 1432	PRACTICAL I- ANIMAL DIVERSITY I & II FUNCTIONAL ZOOLOGY AND APPLIED ZOOLOGY	CO1: Develop skill to distinguish conventional organ system in common, easily available animals.
			CO2: Understand the adage that 'seeing is believing' typical examples and economically important specimen (preserved) to be studied.
			CO3: Apply theoretical knowledge perform routine clinical analysis of blood and urine.
			CO4: Provide hands on training in anatomy through simple dissections and mountings.



## M.Sc ZOOLOGY

SEMESTER	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	ZO211	SYSTEMATICS AND EVOLUTIONARY BIOLOGY	CO1: Understand the principles and practices of systematics.
			CO2: Acquire an in-depth knowledge on the diversity and relationships in animal world.
			CO3: Develop a holistic appreciation on the phylogeny and adaptations in animals.
			CO4. Able to understand the evolution of universe and life.
			CO5. Understand the process and theories in evolutionary biology.
	ZO212	BIOCHEMISTRY	CO1. Understand the chemical nature of life and life process.
			CO2 Get an idea on structure and functioning of biologically important molecules.
			CO3. Ability to illustrate various Biochemical pathways.
			CO4. Develop an interest in the debates and discussions associated with Lifestyle Diseases.
	ZO213	BIOPHYSICS, INSTRUMENTATION AND COMPUTER SCIENCE	CO1. Understand the interdisciplinary aspects of physics, chemistry and biology, importance of various instrumentation techniques used in biological science for analysis.
			CO2 Get an idea on tools and techniques available for studying biochemical and biophysical nature of life.
			CO3. Equipped the learner to use the tools and techniques for project work and research.
			CO4. Develop skill to carry out original research in biology
			5. CO5. Develop analytical and critical thinking skills

			through problem solving.
2	ZO 221	ADVANCED PHYSIOLOGY AND FUNCTIONAL ANATOMY	1. CO1: To get an awareness on comparative anatomy among animal systems / groups
			2. CO2: Gain an insight into human physiology and anatomy.
	ZO 222	GENETICS QUANTITATIVE ANALYSIS AND RESEARCH METHODOLOGY	CO1: understand the principles and mechanisms of inheritance in-depth
			CO2: To sensitize students about the ethics involved in research and enable them to come up with innovative research designs.
			CO3: Explain the fine structure and molecular aspects of genetic material.
			CO4: Learn the mechanism of Inheritance in Man and advanced knowledge in genetics
			CO5: Awareness on the emerging field of research, applications of statistical tools to effectively apply in research and equip them to prepare research papers and project proposals
	ZO 223	CELL BIOLOGY, MOLECULAR BIOLOGY & BIOINFORMATICS	CO1: Understand details of the basic unit of life at the molecular level.
			CO2: Explain the fine structure and functions of cell organelles.
			CO3: Gain an insight to the new developments in molecular biology and its implications in human welfare.
			CO4: Get an overview about the emerging field of research in Molecular Biology.
			CO5: Understand the applications of analysis tools and softwares in bioinformatics.

	ZO214	PRACTICAL I- SYSTEMATICS AND EVOLUTIONA RY BIOLOGY, BIOCHEMISTR Y, BIOPHYSICS,  INSTRUMENT ATION AND COMPUTER	CO1: Develop Observational, Experimental, Analytical and Evaluation skills related to ZO211, ZO212 &ZO213.
	ZO224	PRACTICAL- II ADVANCED PHYSIOLOGY AND FUNCTIONAL ANATOMY	CO1: Develop Observational, Experimental, Analytical and Evaluation skills related to ZO221.
3	ZO231	MICROBIOLO GY AND BIOTECHNOL OGY	CO1: Get an over view of the microbial world, its structure and function.
			CO2: Familiarize the learner with the applied aspects of microbiology.
			CO3: Intensive and in-depth learning in the field of biotechnology.
			CO4: Understand the modern biotechnology practices and approaches with an emphasis in technology application, medical, industrial, environmental and agricultural areas.
			CO5: Familiar with the students with public policy, biosafety, and intellectual property rights issues related to biotechnology.
ZO232	ECOLOGY, ETHOLOGY AND BIODIVERSITY CONSERVATI	CO1: Understand the basic theories and principles of ecology.  CO2: Aware about current environmental issues based on ecological principles.	

		ON	CO3: Gain critical understanding on human influence on environment.	
			CO4: Understand the basics and advances in ethology.	
			CO5: Gain an in-depth knowledge in Ethology in order to understand the complexities of both animal and human behavior.	
	ZO233	IMMUNOLOGY AND DEVELOPMENTAL BIOLOGY		CO1: In-depth knowledge on immunology and immune system as a whole
				CO2: Understand the role of immunology in human health and well-being.
				CO3: Familiarize new developments in immunology.
				CO4: Understand concepts and process in developmental biology and advanced techniques in the field of Assisted Reproductive Technology.
				CO5: Understand and appreciate the genetic mechanisms and the unfolding of the same during development.
	ZO 234	PRACTICAL-MICROBIOLOGY, BIOTECHNOLOGY, ECOLOGY, IMMUNOLOGY AND DEVELOPMENTAL BIOLOGY		CO1: Develop Observational, Experimental, Analytical and Evaluation skills related to ZO231, ZO232 &ZO233.
	4	ZO 241	SPECIAL SUBJECT: FISH BIOLOGY AND FISHERY SCIENCE ICHTHYOLOG	CO1: Understand classification and distribution of fishes
				CO2: Develop knowledge on the adaptations of fishes in special conditions.
				CO3: Procure knowledge on functional morphology, food and feeding, Excretion, Locomotion etc.

	Y	CO4: Develop knowledge on fish genetics and advanced techniques and applications in fish breeding.
ZO 242	FISH BIOLOGY AND FISHERY SCIENCE	CO1: Get knowledge on Fishery Science
	FISHERIES AND AQUACULTURE	CO2: Understand methods of fishing.
		CO3: Understand and study harvesting and post harvesting fish technology.
		CO4: Create awareness about self-employment and self-reliance
ZO243	PRACTICAL- I ICHTHYOLOGY	CO1: Develop Observational, Experimental, Analytical and Evaluation skills related to ZO241.
ZO244	PRACTICAL_ II FISHERIES AND AQUACULTURE	CO1: Develop Observational, Experimental, Analytical and Evaluation skills related to ZO 242.
ZO201	PROJECT	CO1: Develop scientific attitude and problem solving ability.
ZO202	COMPREHENSIVE VIVA VOCE	CO1: Develop effective communication and presentation skills in students as efficient researchers and academicians in future.