PACHHUNGA UNIVERSITY COLLEGE

PROGRAM OUTCOMES (PO) , PROGRAM SPECIFIC OUTCOMES (PSO), COURSE OUTCOMES (CO)

DEPARTMENT OF ECONOMICS	
B.A. ECONOMICS	
Programme Outcome (PO)	Understand the fundamental basic concepts of economics and the dynamic working of different economies of the world. The course is tailor-made for young aspirants in the domain of economics by drawing rich academic inputs from contemporary syllabus reflecting recent developments. Besides, the under-graduate economics programmes help students to establish in-dept understanding of the functioning of domestic and global economies and to develop the necessary and portable skills to perform economic analysis for both public and private sector positions as well as for graduate studies in related fields. The graduate students also possess knowledge about a special bond between environment-economy and sustainable development.
Programme Specific Outcome (PSO)	Graduates of Economics are given priority in getting employment in economic related jobs owing to having had better exposure in under graduation programme with economic curriculum. Besides, they are equipped with knowledge require for qualifying in various competitive examinations like Planning and economic service, Finance and account service, banking and insurance, real estate dealings etc, Higher education prospect is also positive. The Programme Specific Outcome (PSO) can be further summarized as follow:- a) Students will learn the basic concept of economics, how markets organised core economic activities such as production, distribution, consumption and the growth of productive resources. b) Students will learn about the determinants of macro-economic conditions (national output, employment and inflation), causes of business cycles, and interactions of monetary and fiscal policy. c) Students will learn to apply economic theories and methodologies in analysing economic issues in various sub-fields of applied micro-economics and international economics.

Analytical Skills in Economics	**a) Analytical and Economic Reasoning Skills:** Students are expected to be able to deduce reasonable predictions about possible economic outcomes based on economic conditions and economic theories. **b) Quantitative Analytical Skills:** Students are expected to understand how to collect and analyse data and use empirical evidence to evaluate the validity of an economic argument, use statistical methodology, interpret statistical results and conduct appropriate statistical analysis of data. **c) Critical Thinking Skills:** Students are expected to be able to apply economic analysis to everyday problems in real world situations, to understand current events and evaluate specific policy proposals and to

DEPARTMENT OF EDUCATION

Programme Outcome	1. Developing the higher mental processes of students such as logical reasoning, critical thinking, creative thinking and problem-solving abilities so that they can make substantial contributions to the knowledge economy and leads successful lives.
	2. Enabling the students to have a clear understanding of the different concepts and aspects of teaching and learning and the role and impact of education in society.
Programme Specific Outcome	1. On completion of the programme, students will be able to express their thoughts clearly as well as think rationally and critically.
	2. The students will be able to understand the importance of education and its role in solving various individual and social problems.
	3. They will develop an understanding of the process of teaching and learning and the problems associated with it as well as their solutions.

	4. Students will have an adequate knowledge of the different teaching-learning methods and processes and utilize them in actual classroom communication

COURSE OUTCOMES

Course Code	Courses	Outcomes
EDN/I/EC/01	Psychological Foundations of Education	To enable the students to understand the meaning and scope of Educational Psychology; to enable them to understand different aspects of growth and development, individual difference, intelligence, personality, creativity etc.
EDN/II/EC/02	Philosophical and Sociological Foundations of Education	To develop an understanding of the roles of Philosophy and Sociology in Education; to develop understanding of current social problems relating to education; to understand the influence and contribution of major schools of Philosophy to educational theory and practices.
EDN/III/EC/03	Development of Education in India	To help students understand the development of education in India in historical perspectives such as ancient, medieval and British India; to have an adequate knowledge of various Educational Commissions and Committees; to understand the development of education in Mizoram.
EDN/IV/EC/04	Issues and Trends in Contemporary Indian Education	To develop understanding of basic aspects and problems relating to elementary, secondary and higher education and the role and functions of various organizations at different stages; to help students understand important modern trends in education.
EDN/V/CC/05	Research Methodology in Education	To develop and understanding about the concept and types of Educational Research and acquaint them with various methods of research.
EDN/VI/CC/06	Statistics in Education	To acquaint students with basic statistical techniques and to develop the ability to organize data and interpret test results.

EDN/VII/CC/07	Educational Evaluation	To develop an understanding of the need and importance of Evaluation in education and develop knowledge about various types of measuring scales, construction of tests, new trends in evaluation.
EDN/VIII/CC/08 'A'	Educational Technology	To enable students to understand about the concepts, nature and scope of Educational Technology and to expose them to the basic developments in this field.
EDN/IX/CC/09	Curriculum Development	To understand the meaning, concept and scope of curriculum as well as the basis of curriculum construction, transaction, evaluation and innovation.
EDN/X/CC/10	Educational Planning and Management	To develop knowledge of the meaning, scope, process and types of management and various managerial activities and develop the ability of making objective decisions in Educational Management.
EDN/XI/CC/11	Development of Educational Thought	To develop familiarity with the evolution of educational thought through the ages in important societies and to understand the development of educational thought and practices in global perspectives.
EDN/XII/CC/12'C'	Special Education	To enable the students to understand various types of disorders, problems of challenged children and their education.

DEPARTMENT OF ENGLISH		
COURSE OUTCOMES		
Course Code	**Courses**	**Outcomes**
ENG/I/FC/1	English-I	This compulsory course will enable students to acquire composition and communication skills through learning fundamental grammar and its usage, as well as through various exercises in comprehension and composition; they are also equipped with theoritical and practical applications of communication skills, through mock-interviews and mock-presentations.

ENG/II/EC/2	History of English Literature	By tracing the growth of English literature from the Old English Period to the Modern Era, the students will acquire a sound comprehension of the literary, societal, cultural and historical background of British Literature; they will also be familiarized with the history of Great Britain and its main events, conflicts and era-specific trends.
ENG/ II/FC/2	English-II	This second compulsory course is aimed at introducing students to English Poetry and short stories written by Indian authors so as to familiarise them with these literary genres and the socio-cultural backgrounds that produced them
ENG/III/EC/3	History of English Language and Phonetics	To trace out the history of English language and the various components of linguistic structures of the language
ENG/III/FC/3	Alternative English	This course features English Poetry and short stories from North-east Indian writers in translation, and will help the students to critically analyse the historical and political movements that produces literature from different regions, as well as the challenges and issues faced by translators, and a deeper appreciation of the nuances of the vernacular languages
ENG/IV/EC/4	Fiction-I	To acquire a sound comprehension of the canonical texts from various ages of British fiction.
ENG/V/CC/5	Drama-I	To gain knowledge on the fundamental basics of British drama from its inception, tracing its development upto the 19th century
ENG/V/CC/6	Women's Writing	To gain a deeper insight into the writings of women from different eras, races and nationalities and how their innermost thoughts, struggles and feelings are expressed in fiction.

ENG/V/CC/7	Literary Theory and Criticism	To gain a deeper knowledge into how literary texts have been critically analysed and studied throughout the ages and the theoritical and critical frameworks used to analyse different literary genres
ENG/V/CC/8A	Fiction-II	To attain an insight into Fiction written in the post World-War era, especially pertaining to Colonialism, war, identity politics and the after-effects of trauma as expressed through literature
ENG/V/CC/8B	Popular Studies	To trace the development of a burgeoning popular literature within popular cultural movements, through songs written about, and during the Countercultural Movement in the West, and through novels written by Indian authors that highlight the conflict and synergy between western and eastern thoughts, practices and philosophies. This course aims at revealing the concerns of the younger generation in a society undergoing various transitional shifts.
ENG/VI/CC/9	Indian Writing in English	To learn the literary, societal, cultural and historical backgrounds of the greatest English writings penned down by Indian authors writing in, or translated into, English; to better appreciate that these texts- fiction and plays- are a testament to the psyche of the Indian people as they grapple with social and political issues such as colonialism, racism, prejudice, and the search for identity in a society caught between the traditional and the modern, the eastern and the western.
ENG/VI/CC/10	Drama-II	To trace the innovation and growth of the dramatic form of literature in the modern era, and the implementation of the experimental and the controversial into this artistic form of literature.
ENG/VI/CC/11	Literary Criticism	To gain critical frameworks of texts written in English through the close examination and cross-comparision of specific works of various literary critics and thinkers through the ages

ENG/VI/CC/12A	American Literature	To acquire a better understanding and comprehension of American literature and the ways in which it has been shaped by, and in its turn, helped to shape the social, political, cultural and historical events of the country and its people.
ENG/VI/CC/12B	Commonwealth Literature	To obtain information on colonialization, post-colonialization, issues of identity, race and politics through literature written in and translated into the language of the colonizer; to better understand the struggle of the colonized mind as it grapples with questions of indigeneity in terms of culture, religion and rituals, especially in juxtaposition with that of the colonizer's.
Additional papers	Literary Appreciation	A preparatory course aimed at further examination of different literary terms, forms and genres, so as to better appreciate and understand literary texts
	Basic Theory	A preparatory course aimed at acquainting the students with various literary and critical theories beyond what is prescribed in their syllabus, so as to better equip them with the basic framework of these various theories and the proponents thereof.
	Seminars and Assignments	All courses compulsorily include a Seminar on different topics covered by the course so that the students are acquainted with the practical applications of the implementation of the various perceptions through the programme

DEPARTMENT OF HISTORY

Program Outcomes	The expected Programme Outcome is to provide the students with a sense of how interconnected our present is with the past and how learning about the past provides them with the skills to understand the present. To facilitate this understanding, our courses, class room instruction and assignments give students the ability to think and reach their own conclusions. Out tutorial discussions, written assignments, class room presentations consolidate their ability to analyse, research and process information.
Program Specific Outcomes	• On completion of the course students are expected to have acquired the skills of critical thinking, rational enquiry, effective communication, and exploring the relationship between past, present and historiography. • Knowledge of multiple perspectives through which significant developments in the history of the Indian subcontinent from the earliest times up to the period after independence. • Ability to carefully read a complex historical narrative, evaluate its deployment of evidence, and understand its argument as well as critically analyse the same. • Sensitivity to gender and social inequalities as well as acquaintance with the historical trajectories of these issues. • Graduates are expected to branch out into different parts seeking spheres of knowledge and domains of professional work that they find fulfilling. They will be able to demonstrate comprehensive knowledge of scholarly research and professional literature relating to the discipline. This will establish a platform from which the student can pursue higher studies in history.

Course Outcomes

Paper	Courses (Name & No.)	Outcomes
I	History of Mizoram	Intended to familiarise the student with the nature of historical development and

	(Up to the1960s)	present a broad outline of the political history of Mizoram.
II	History of India up to Post-Maurya period	On completion of the course the students would have been familiarized with the social, economic, political and cultural developments in India from the Chalcolithic period up to the post-Maurya period. It introduced students to elements of change and continuity in Indian history.
III	History of India (Gupta to Sultanate periods)	This course introduced the students with the social, economic, political and cultural developments in India from the Gupta to the early Medieval periods. It also introduced students to the coming and history of the Muslims in India and how the Muslim culture is integrated with the Hindu culture thereby forming an Indo-Muslim culture and heritage.
IV	History of the Mughals	It provided a overview of the main trends and developments in India during the Mughal period (1526-1757). The emphasis of the course is on the socio-economic and cultural patterns in understanding the polity and society as they took shape in the period under study.
V	Modern India – I	This course acquainted the students with the major developments in India with special reference to the rise and growth of British power in India, emergence of national and anti-colonial movements.
VI	Historiography	Introduced the students into the study of history. It familiarized students with concepts such as the definition of history as an academic discipline, historical facts and their relationship to past realities, the notions of memory, tradition and sources, the historians role in constructing the past, narrative and analytical approaches to historiography, the status of history as a (social) science and the social functions of history.
VII	Early Modern Europe	This paper balances political, economic, religious and cultural history of Continental Europe till the early modern period. Beginning with the fifteenth-century conquest of the “Atlantic Mediterranean”, it traces the emergence of Europe as the first truly global power while at the same time the people, ideas, and forces that have shaped the

		character and institutions of the modern world are discussed.
VIII (c)	History of North East India (1822 - 1986)	It introduced students to the major trends of political, social and economic developments in the North East India from 1822 to the re-organisation of state in 1972. It also included the Memorandum of Settlement signed between the Indian Government and the MNF in 1986.
IX	Modern World History	With emphasis on Europe it analyzed, the political, economic, social and cultural transformations of the Modern World that took place from the 19th century till the end of the second World War.
X	Contemporary World	It surveyed the political, economic, social and cultural history of the world since the end of the Second World War till the end of the 20th century.
XI	Modern India - II	It acquainted the students with the major developments in India with special reference to the emergence of national and anti-colonial movements in India
XII	History of Modern China	It imparted students the knowledge of major historical developments in the 19th and early 20th centuries in China

DEPARTMENT OF MIZO

A. COURSE OUTCOME	
Courses	**Course Outcomes**
Paper I **(Poetry - I)**	— Obtaining information about Mizo traditional verse form, themes and techniques. — Encouraging to know the techniques of poetry
Paper II **(Drama - I)**	— To study the techniques and structure of Classical to Contemporary Drama — Obtaining the history and quality of Mizo Drama

Paper MIL- I **Introduction to Mizo Language and Literature**	— To obtain the basic knowledge of Mizo language, culture, society and literature — To acquire good knowledge of Mizo poetry, Drama and Prose
Paper III **(Mizo Elective - Fiction I)**	— To aware Mizo fictional style of writing — To obtain various types of fiction from Mizo to English literature
Paper IV **(Essays)**	— Understanding types of essay and its techniques — To aware Mizo prose writing — Through essay writing students can understand social issue and contemporary society
Paper V **(Theory of Literature)**	— To acquire knowledge of literary theories and its application — Understanding Literary criticism from Mizo to English literature — To inculcate critical ideas in the field of literature
Paper VI **(Selected English Poems)**	— Understanding Romantic, Victorian and Modern English and American Literature — Understanding Romanticism, aestheticism, didacticism, metaphysical poetry, Victorian compromise, issue of contemporary English literature
Paper VII **(Poetry - II)**	— To analyse themes and techniques of Mizo traditional verse form — To encourage critical appreciation of Mizo poetry — Understanding of age wise classification of Mizo Poetry
Paper VIII (A) **(Drama - II)**	— Understanding theoretical grounding of Drama from Mizo to English — Understanding of classical and romantic drama — Understanding the history of Mizo, English and Classical drama
Paper IX **(History of Mizo Literature)**	— As the title suggest that it is an attempt to provide the entire scenario of Mizo literature

Paper X **(Fiction II)**	— To understand technques of Mizo short story writing — Comparative analysis of short story writing — Understanding history and trend of Mizo short story
Paper - XII **(Mizo Language and Grammar)**	— To analyse Mizo language and grammar — To acquire knowledge of Mizo gramatical rules including prefix, sufix etc., — To inform origin, history, aspect of Mizo language — To study the development and enrichment of Mizo language
Programme outcome	
BA (Mizo Language and Literature)	— Students are equiped with a knowledge of literary theories and its application — To acquire a knowledge of history, trends and development of Mizo literature — To get a better comprehension of literary, societal, cultural, biographical and historical background of the writings of Mizo literature. — To traced out the history of Mizo language and various components of Mizo grammar and language.
Specific Outcome	
BA (Mizo Language and Literature)	— On succesful completion of the course, the students will be enhanced with a deep knowledge of Mizo culture, language and literature — They can apply critical frameworks to analyse cultural and historical background of texts written in Mizo — They will be familiar with the conventions of diverse textual genres including fiction, poetry, prose, drama, criticism etc.

DEPARTMENT OF PUBLIC ADMINISTRATION	
PROGRAMME OUTCOME	The programme offers students an understanding of the mechanisms of the government and other agencies for the creation and implementation of public policies. It also provides integrative knowledge, skills, and ethics necessary for responsible administrative, management and leadership positions ensuring the students to articulate and apply a public service perspective towards an efficient and effective public administration.
PROGRAMME SPECIFIC OUTCOME	1. The programme will provide a comprehensive knowledge of public affairs, policy development, policy analysis, economic analysis, management skills, and organization theory and applications to public service to the students. 2. It nurtures the analytical skills of the students in understanding, solving and synthesising current social, economic and political situations. 3. Completion of the programme opens avenues for the students in pursuing a Masters Degree in Public Administration and applying for jobs in the Public and Private Sectors.
COURSE OUTCOME	
Paper I - Elements of Public Administration PA/I/01	The paper introduces the students to the fundamentals and foundations of Public Administration. It also provides in comprehending the changing paradigms of public administration, theories, approaches and concepts of administrative practices.
Paper II - Administrative Theory PA/II/EC/02	The paper involves the theories of different thinkers in studying organizations to identify the key factors that maximize or minimise efficiency and effectiveness. These factors are henceforth put into ideas and strategies that can be practiced by public administration professionals for effective decision/policy making as well as other administrative tasks. Furthermore, it also involves engaging in theory-based training that explores the many tested methods of public administration.

Paper III - Public Administration in India PA/III/EC/03	The study connects the historical events and the present situation of Indian Administration. It acquaints the learner - the structure,the purpose, the processes and the functioning of the Indian Administration. It touches on important administrative issues such as transparency and accountability making the student aware of the need for administration and their need for participation in administration.
Paper IV - Public Personnel Administration in India PA/IV/04	The course helps the students in identifying the systems and processes of human, financial and material resources. It focusses on the skills and qualifications required for effective administrative functioning thus enabling the students in comprehending and appreciating capacity building strategies and programmes of the government.
Paper V - Bureaucracy and Development PA/V/CC/05	This course of study deals with policy formulation, implementation, institutions and processes of bureaucracy. It familiarises the learner to comprehend governmental administration and the institution of civil services and service delivery mechanisms.
Paper VI - Local Self Government in India PA/V/06	This course familiarises the students with the structure, processes and functioning of local government in the rural and urban areas of India. It emphasises the importance of political, social and economic participation of the people at the grassroot level, accentuating Indian democracy. The study moulds and develops the capacity of students as responsible citizens in identifying and determining local needs as well as planning and monitoring development and welfare programmes
Paper VII - Economic Administration PA/V/07	The course of study focusses on the entire economic administration of India. The various functions performed by Planning Institutions are dealt with in detail in this study thereby providing a clear understanding of the functioning of the government towards economic development.
Paper VIII(A) - Social Administration PA/V/08(a)	The paper focusses on the planning, development and implementation of social policies of the Government of India and the State Governments. It gives the learner an indepth study of the administrative advocacy of the government in ensuring and promoting the welfare of the less privileged sections such as Women, Children and the Differently Abled persons through various governmental schemes and programmes. The interplay and involvement of individuals, governmental and non-governmental agencies in pursuit of successful implementation of social policies has also been emphasised thus determining the need of the learner in participating and promoting the policies if the government and most importantly the welfare of the people.
Paper IX - Political and Administrative Institutions in NE India PA/VI/09	The course studies the origin and history of the administration of the North-eastern states of India helping the learner to connect and comprehend the present system of administration. The diverse ethnic identities resulting mainly due to the demography of these states is also recognised and realised by the students.

Paper X - Administration of United Nations PA/VI/10	This course deals with the administration of the United Nations tracing its history prior to the First World War to the present. It also makes the learners realise the impetus for setting up international organisations and their pivotal significance for maintaining international peace, harmony and prosperity.
Paper XI - Office Management PA/VI/11	This course helps the learner in understanding the concept of office and the importance of its outlay in ensuring smooth and successful functioning of office performance and tasks. Moreover, it also emphasises the need for office mechanisation and use of present-day technology in enhancing efficiency and economy in the day to day office performance.
Paper XII - Rural and tribal Development PA/VI/12(b)	This course examines the rural and tribal policies, laws etc. in India. It equips the learner with the knowledge of various tribal issues and challenges in India. It also makes them aware of the constitutional and legal provisions for rural and tribal development. Rural and tribal development schemes are also studied alleviating the status of the rural and tribal population of India.

DEPARTMENT OF PHILOSOPHY (UNDER GRADUATE)

Programme Outcome –

- The programme will make the students to cultivate critical thinking ability to identify and understand different problems of everyday life. Developing critical thinking will also help the students' intellectual, personal and professional abilities. This will ensure high standard of behaviour in their social relation and become responsible citizens.

Programme Specific Outcome –

- On the successful completion of the Programme the students will be able to develop their own opinion and ideas about different issues of life, a deep social consciousness with highly developed sense of justice, equality, liberty and fraternity. They will understand human dignity, value and worth which enable them to understand themselves better and the society they live in and thereby become contributing member for the progress of the society.
- This programme contains a comprehensive job-oriented study. It sufficiently prepares them to face all competitive exams for civil services, teachers, lawyers, politicians, social workers, human right activists, environmental activists etc. and many other entrepreneurships.

Course Outcomes

Course code	Name of Course	Outcomes
PHIL/I/EC/01	Epistemology and Metaphysics	• It enables students to understand the general concepts and the application of philosophical methods such as Induction, deduction, analysis, synthesis etc. to real life problems.

		• It helps students to have adequate knowledge of different philosophical theories and metaphysical categories (Western and Indian) such as reality, truth, cause and effect relation, sources of knowledge, space and time and develop critical thinking.
PHIL/II/EC/02	Ethics	• It helps students understand basic ethical concepts, ethical theories, ethical ideals, values and ethical consequences such as good, right, duty, punishment etc, how to make moral judgements, meaning of motive and intention of actions, consequences of the choices we make etc.
PHIL/III/EC/03	Logic	• It enables students to understand deductive and inductive reasoning and prepares students in facing Aptitude tests. • It helps students understand the importance of using correct language in everyday discourse. • It helps students understand the importance of different functions of language and the fallacies committed in everyday discourse. This helps students identify the correct and incorrect use of terms. • It helps students understand the function of symbols and the behaviours of words in ordinary speech.
PHIL/IV/EC/04	Modern Western Philosophy	• By studying this paper, the students develop systematic and critical understanding of the basic concepts and problems in Western Philosophy, the conflict between reason and sense experience as the origin and valid knowledge, the importance of the knowing mind and how knowledge of reality becomes possible, what can and cannot be known by using different methods.
PHIL/V/CC/05	Indian Philosophy	• This paper helps the students to understand the meaning of different concepts and theories in various schools (Astiks and Nastiks) of Indian Philosophy, their theories of knowledge, reality, truth, existence, causation, ethics, liberation, and human destiny.
PHIL/V/CC/06	Philosophy of Religion	• Philosophy of Religion introduces the students to understand the nature and concerns of different religions, relation between religion and science, theology and philosophy of religion, the place of reason, faith, revelation, mystic experience, proofs for the existence of god, the idea of suffering and liberation in different religions. • It helps the students understand some socio religious issues such as the problem of evil, religious conversion, possibility of inter religious dialogues etc.
PHIL/V/CC/07	Social and Political Philosophy	• On the completion of this paper the students learned the meaning of the important concepts used in social and political world, different social institutions like family, marriage, education, religion, property, the place of individual in the society. • They also understand what is power and authority, justice, equality, liberty, rights, duties and accountability. • They are acquainted with different political actions such as reform, rebellion, revolution, Satyagraha etc. to bring about a better society.
PHIL/V/CC/08(A)	Phenomenology and Existentialism	• It helps the students to explore the idea of human being, the self and its existence, theistic and atheistic existentialism, the concept of individual freedom, will and authenticity.

PHIL/V/CC/08(B)	Philosophy of Law	• After the completion of this paper the student understands different concepts used in the field of law and its perspectives. It acquaints students with different traditional natural law theories, constitutional laws, criminal law, contract law. • It also helps students understand Legal and moral obligations, responsibilities and privacy. This helps develop a deep sense of respect for law.
PHIL/VI/CC/09	Philosophical Analysis	• It enables the students to understand meanings and definitions in language. • Students became aware of knowledge and its limitations (scientific knowledge), the elements of analytic truths and certain metaphysical problems.
PHIL/VI/CC/10	Philosophy of Mind I	• This paper helps the students to distinguish between scientific study of mind as in psychology from its conceptual study as in philosophy, it helps them understand the problems like mind and body relation, personal identity, knowledge of other minds, artificial intelligence, mind and science, problem of consciousness etc.
PHIL/VI/CC/11	Greek and Medieval Philosophy	• In this course students were introduced to early Greek Philosophies taken into consideration Thales, Pythagoras, Socrates etc. Students were taught the metaphysical and epistemological theories of Plato and Aristotle. • Students became well acquainted with the problems of evil, freedom, knowledge and metaphysical problems in the philosophy of St Augustine and St Thomas Aquinas.
PHIL/VI/CC/12(A)	Feminist Philosophy	• It helps students understand and recognize gender bias in everyday life, the low status of women in society, feminism, rationale for gender equality, perspective on feminist epistemology and metaphysics, feminist ethics, eco- feminism various theories and the new trends such as gender egalitarianism, gender politics, inter sectional feminism and empowerment of women.
PHIL/VI/CC/12(B)	Philosophy of Mind II	• This paper helps the students to distinguish between scientific study of mind as in psychology from its conceptual study as in philosophy, it helps them understand the problems like mind and body relation, personal identity, knowledge of other minds, artificial intelligence, mind and science, problem of consciousness etc.

DEPARTMENT OF POLTICAL SCIENCE		
PROGRAMME OUTCOME		Completion of this programme will help students acquire working knowledge of the political systems of the state, the nation and the world at large. Knowledge of various Constitutions will help students interpret, explain and critically assess events, patterns and structures of Governments. They will have a working knowledge of the greatest force at play namely, the play for power and the idelogues giving action to the play. Students will develop a critical understanding about the nature and philosophy of the subject, interprete Government policies and generate observations of relevance to policy makers, their fellow citizens and global communities. The knowledge gained from completing the course will making them valuable assets to the society, model citizens and great contributors to an ever-changing man and society.
PROGRAMME SPECIFIC OUTCOME		1. This course will help them acquire specialized knowledge of the political narrative. 2. It will help develop general skills that will serve students for their future course of study regardless of continuity in the subject. 3. This course will help them reach their specific goals; in acquiring employment viz., UPSC, MPSC, Judicial Services, Politicians etc.
COURSE OUTCOME		
POLS/I/EC/01	Paper I - Govt. Politics of Mizoram	This paper introduces students to the political history of Mizoram and of the North East India; political evolution of the state of Mizoram. Past and present political parties in Mizoram: their origin, growth, and achievements would be known to students. Various local self-governments, both rural and urban, being practiced in the state would also become familiar to students. The paper would mould students to love and cherish their past political history, to be active participants in the working of the great Indian democracy, and to appreciate the role of grassroots democracy.
POLS/II/EC/02	Paper II - Indian Govt. & Politics	The study of this course would inculcate knowledge on Indian Constitution, the working of Governments at various levels, problems and prospects of Indian federalism and understanding of threats and challenges in Indian democracy.

POLS/III/EC/03	Paper III - Major Political Systems	The course familiarises the students with the salient features of the Constitution, political system and governmental setup of leading countries of the world. It also enables them to have a comparative analysis of democratic system of India and elsewhere.
POLS/IV/EC/04	Paper IV - Political Theory	Through this paper, students come to know: (a) the origin and evolution of the state, (b) the meaning and role of welfare state, (c) and understand the meaning of vital concepts such as liberty, equality, and justice including their practical application in everyday life. Students also learn the meaning and theories of democracy
POLS/V/CC/05	Paper V - Western Political Thought	Students would have mastered ideas and thought of the most well-known political thinkers of the West. This would firmly lay the foundation for understanding the present day liberal ideal and theories that have dominated much of the world such as democracy, freedom, justice, equality, rights and duties, governance, political system etc. The search for the ideal man (Citizen) and the ideal state is as relevant as it was two thousand years ago.
POLS/V/CC/06	Paper VI - International Relations	This course would impart understanding of the concepts and various issues in International system, recent trends in international relations and how it effects peace and security of the world. A clear understanding of the world system is obtained through the study of actions, counter actions and interactions of units of international society.
POLS/V/CC/07	Paper VII - Public Administration	This course focuses on the administrative aspect of the Government. It will make students understand the cooperative effort required to promote stability and help them realize the importance of good policy formation and government programmes. This course will equip students with the knowledge of theories and expertise to assist the Government in making and implementing policies to ensure better life for its citizens.
POLS/V/CC/08(A)	Paper VIII (a) - Human Rights	The study of this course would help promote the understanding of Human Rights at the conceptual level and its practical application in the society. This study will give awareness to students of their very basic freedoms to the rights they are entitled to. The study of various group rights such as women, child, minority, old age and the disabled hope to inculcate in them the importance of inclusivity in policy making and tolerant of differences. This course hope to make students positive agents of change and teach them skills of negotiation, mediation, and consensus building.

POLS/VI/CC/09	Paper IX - Indian Political Thought	This course focuses on the political philosophy stretching from ancient to modern India. It will introduce students to great personalities who then and now continue to influence societies across the globe such as Kautilya, Raja Ram Mohan Roy, Gokhale, Gandhi, Nehru and more. This course would also help them understand their way of thinking shaped by their time, religious beliefs and introduce them to their indigenized concepts such as socialism, nonviolence, social liberalism, nationalism, total revolution etc. all of those ideologies which helped shape India into what it is today.
POLS/VI/CC/10	Paper X - Indian Foreign Policy	The study of this paper would introduce students to the background of the making of Indian Foreign Policy including various factory that shape foreign policy through the ages. It would further enable students to learn the dynamics of Indian Foreign Policy in a changing would of international politics. Students would also learn Indias' realtion with major world powers and her immediate neighbours and Indias' standing in the community of nations in the world. Most importantly, this paper would senstize students to take up responsibilities as citiczens to propel India as world power. In this very century touted as the Asian century, to enble India to take her rightful place in the world stage.
POLS/VI/CC/11	Paper XI - The United Nations	This course will help students in analysing the structure and functioning of the worlds largest international organization viz., the United Nations. It will help sensitize students to the burning issues of the world through the study of their work to promote peace and security. It will also introduce students to the Human Rights and the working of the UN through their various agencies such as UNESCO, WHO and ILO and their programmes such as UNICEF, UNDP and UNEP. It will also question the relevance of the UN and also analyse the reforms required in the organisation.
POLS/VI/CC/12 (A)	Paper XII (a) - Political Sociology	The aim of the course is to enrich the students' knowledge on connection between the society and political system, the adverse effects of social evils on the polity. It also imparts understanding on political culture through a comparative study of society ad politics of different societies. At most, it socialize students toward the political system and encourge them to be an active participant in politics.

Department of Psychology	
Course Outcomes	
Courses	**Outcomes**

Basic Psychology I (PSY/CC/101)	• convey key concepts and theoretical approaches in several areas of psychological science • describe biological, psychological, and social foundations of typical and atypical behaviour and mental processes
Practical (PSY/CC/102)	• enables students to use psychological tools for assessment in the fields of Intelligence, Learning, Memory and Aptitude
Basic Psychology II (PSY/CC/201)	• *describes basic* theories and methods found in psychology and see how they play a big role in individual's daily life
Practical (PSY/CC/202)	• enables students to use psychological tools for assessment in the fields of Creativity/Problem Solving, Motivation, Sensation/Perception and Personality
Lifespan Development (PSY/CC/301)	• Lifespan development explores how we change and grow from conception to death. • describes development as a lifelong process that can be studied scientifically across three developmental domains: physical, cognitive development, and psychosocial.
Practical (PSY/CC/302)	• enables students to use psychological tools for assessment in the fields of Social Maturity, Adjustment, Family Environment and Parenting Style
Health Psychology (PSY/CC/401)	• give importance to both *psychological* and behavioral processes in *health*, illness, and healthcare. • understand how *psychological*, behavioral, and cultural factors contribute to physical *health* and illness.
Practical (PSY/CC/402)	• enables students to use psychological tools for assessment in the fields of Psychological Well-Being, Stress, Health Habits and AIDS Awareness

Research Methodology (PSY/CC/501)	• understand the advantages and limitations of different research methods • generate research questions and implement appropriate research methods to answer them • draw appropriate inferences from obtained findings • identify and apply appropriate quantitative and/or qualitative data analysis techniques • use statistical software to analyze data and solve data analysis problems • identify ethical issues and ramifications of actions and policies in research and other settings • adhere to and apply ethical principles, and demonstrate social responsibility • recognize different perspectives that can be applied to ethical dilemmas
Project Work (PSY/CC/502)	• design, run, and analyze research studies using SPSS and write reports in the APA style
Emergence and Growth of Psychology (PSY/CC/503)	• identify historical trends, recent advances, and the limits and advantages of psychological theories
Practical (PSY/CC/504)	• enables students to use psychological tools for assessment in the fields of Reaction Time, Absolute Limen, Differential Limen and Span of Attention

Social Psychology (PSY/CC/505)	• describes and explain self concept, social cognition, attribution theory, social influence, group processes, prejudice and discrimination, interpersonal processes, aggression, attitudes and stereotypes.
Practical (PSY/CC/506)	• enables students to use psychological tools for assessment in the fields of Leadership, Attitude, Aggression and Interpersonal Relationship Orientation
Abnormal Psychology I (PSY/CC/507A)	• deals with psychopathology and abnormal behavior, often in a clinical context, covers a broad range of disorders, from depression to obsessive-compulsive disorder (OCD) to personality disorders
Practical (PSY/CC/508A)	• enables students to use psychological tools for assessment in various topics like Projective tests, Child Psychopathology, Anxiety and Stress/Coping
Organizational Psychology I (PSY/CC/507B)	• applies psychological theories and principles to organizations. • focuses on increasing workplace productivity and related issues such as the physical and mental well-being of employees.
Practical (PSY/CC/508B)	• enables students to use psychological tools for assessment in the fields of Leadership Styles, Differential Aptitude Tests, Interests and Job Satisfaction
Physiological Psychology (PSY/CC/601)	• understand neural mechanisms of perception and behavior through direct manipulation of the brains of nonhuman animal subjects in controlled experiments.
Practical (PSY/CC/602)	• enables students to use psychological tools for assessment in the fields of Psychophysiological State, Stroop Test, Memory and Bender Gestalt Test
Applied Psychology (PSY/CC/603)	• assess and critically evaluate information, ideas, and assumptions

	comprehensively and from a variety of perspectives • use relevant sources of scientific knowledge to identify, frame, and generate novel solutions to problems or issues • contribute to knowledge and problem solving using integrative and creative approaches
Practical (PSY/CC/604)	• enables students to use psychological tools for assessment in the fields of Environmental Awareness/Attitude, Sports Personality, Military Environment and Multifactor Leadership
Counselling Psychology (PSY/CC/605)	• helps people with physical, emotional and mental health issues improve their sense of well-being, alleviate feelings of distress and resolve crises • provide assessment, diagnosis, and treatment of more severe *psychological* symptoms.
Practical (PSY/CC/606)	• practical exposure and practice in the field of Counseling through field exposures to relevant organizations
Abnormal Psychology II (PSY/CC/607A)	• Maladaptive actions or cognitive processes that defy social norms. • assessment of different psychological disorders through psychological tools and techniques • use diagnostic techniques to help categories and classify maladaptive behavior
Practical (PSY/CC/608A)	• enables students to use psychological tools for assessment using Projective tests, Depression test, Minnesota Multiphasic Personality Inventory - 2 and Neuropsychological test
Organizational Psychology II (PSY/CC/607B)	• study of both group and individual performance and activity within an organization. • examines human behavior in a work environment and determines its

	impact on job structure, performance, communication, motivation, leadership, etc.
Practical (PSY/CC/608B)	• enables students to use psychological tools for assessment in the fields of Job Motivation, Communication, Performance Scale and Occupational Stress
Program Outcomes	• Developing intellectual, personal, social and professional abilities through effective effective communicative skills; ensuring high standard of ethical behaviour in both research and practical fields and shaping the students to become socially responsible citizens
Program Specific Outcomes	• write correct, clear, concise, and convincing research reports and papers • convey psychological theories and findings to both scientific and non-scientific audiences • give presentations to increase knowledge, foster understanding, and impact the target audience • communicate and contribute in group activities and in discussions to facilitate goals

	• use psychological principles to generate solutions to personal, social, organizational, and societal problems • understand the practical importance and uses of the concepts and methods of psychology • transfer learning and psychological knowledge to novel contexts and situations

Course outcomes for all Courses:	
Department of Biotechnology	
Programme Outcome	Biotechnology teaches about biomolecules, their characteristics and functions and the technologies that manipulate living organisms and biological systems to produce products that advance healthcare, medicine, agriculture and environment health and safety.
Programme Specific	Graduates will demonstrate proficiency in basic science and a working knowledge of advanced biological sciences. They will understand the principles and the applications of molecular biology methods with an emphasis on the application of recombinant DNA technology to animals, plants and microbial organisms. The course will give them practical and theoretical knowledge essential for pursuing higher studies. They will recognize the importance of bioethics and IPR and acquire knowledge in domain of biotechnology enabling their

	applications in industry and research.	
B.SC BIOTECHNOLGY COURSE OUTCOMES		
Courses		Outcomes
BT I & II	Cell Biology & Biomolecules	Cell biology is a broad area in which students will enrich their knowledge with the structure and function of a cell, from the most general properties shared by all cells to the unique, highly intricate features particular to specialized cells. They will understand the classification, biological function and chemical and physical properties of biomolecules and gain knowledge on bioanalytical techniques.
BT III & IV	Biochemistry	On studying this paper, students will understand the concept of metabolism of biomolecules, mechanisms of enzyme action and biosynthesis of amino acis and fattyacids. They will also be able to perform various experiments related to biochemistry.
BT V & VI	Microbiology	This course presents the basic concept of microbiology. Its goal is to make the student understand history, nomenclature, structure and properties of microbes. On successful completion of the subject, the student should have learned the preparation of different culture media, technique for obtaining pure culture, different staining method and microbial growth measurements.
BT VII & VIII	Genetics	On completion of the courses students will learn about the classical genetics and inheritance pattern which will make foundation for the advanced genetics.

		They will understand gene maps, gene interactions and the influence of environment on gene expression. They will understand cell cycle and have knowledge about chromosomes and its aberrations. They will understand bacterial recombination mechanism and learn about transposons.
BT IX & X	Molecular Biology	On completion of the courses students will be able to understand the genome organization in prokaryotes and eukaryotes, the properties of genetic materials and the genetic code. They will be able to explain mechanisms involved in DNA replication, gene expression, gene regulation DNA damage and repair. Students will be able to perform DNA extraction from tissue samples.
BT XI & XII	Recombinant DNA Technology	On studying this paper, students will understand the fundamental concepts of recombinant DNA technology. They will learn how to select the suitable vectors for different purposes and will be able to how to insert the desired foreign DNA into host cell. They will gain knowledge about the extraordinary power of restriction and other enzymes in molecular cloning and genetic manipulations. They will be learn techniques like PCR, blotting techniques and sequencing methods.
BT XIII & XIV	Biostatistics and Bioinformatics	On completion, students will be able to classify various types of data and apply basic statistical concepts such as measures of central tendencies and dispersion. They will understand the methodologies of biostatistics and will be able to apply them in solving biological problems. Students will gain knowledge about protein and genome databases and understand about the data retrieval tools and its utilization. They will be able to perform alignment of sequences and construct the phylogenetics of different sequences.

BT XV C* & XVI C*	IPR and Biopiracy	On successful completion of this course student will be aware of plagiarism, patents laws, Intellectual property right, Indian and International patent laws and technology transfer. Its goal is to make the students aware of their rights to protect their finding and motivate them to filling patents of their findings. Students will be aware about the exploitation of traditional knowledge and steps taken to protect them. They will be aware of patent cases and learn about the Biodiversity Act and other measures taken to prevent biopiracy.
BT XVII & XVIII	Plant Biotechnology	Plant biotechnology is a powerful tool that can be applied for the development of new stress-resistant varieties to satisfy the demand of food for an ever-increasing population, generation commercial plant products, restoration of biodiversity. This paper will help students to develop an idea for gene functional analysis for fundamental and applied researches, construction expression vectors, transgenic plant varieties generation, expertise in plant tissue culture, biofertilizers and bioinsecticides.
BT XIX & XX	Animal Biotechnology	On completion of this course student will have knowledge about animal cell culture and maintenance under septic conditions, in different culture medium. They will know about molecular pharming and its uses for the production of therapeutic proteins; concepts of animal breeding and strategies for improvement of livestock.

BT XXI & XXII	Immunology	This course presents the different immunological technique and concept of basic immunology. On successful completion of the subject the student should have understood: Immunity, Antigen, Antibody, Cells of immune system and their function and regulations, Major histocompatibility complex, Hypersensitivity. Students will be able to interpret association of immune system with autoimmunity, and infectious diseases and demonstrate immunological techniques.
BT XXIII B* & XXIV B*	Medical Biotechnology	On successful completion of the subject the student should have understood the scope of medical biotechnology, gain new insights into methods in gene therapy, different vaccine technology and immunoenhancing technology. They will understand wound healing and will be able to describe the different biomaterials and its properties, design, fabrication and biomaterials selection criteria for tissue engineering scaffolds. Students would understand the approaches to organ transplantation and gain knowledge about medical genetics, the different diagnostic procedures and counselling approaches.

Department of Botany	
Course Outcomes	
Courses	**Outcomes**
Cryptogams I (BOT/I/EC/01)	• Understand the distinguishing features, and systematic classification of cryptogams • Critical understanding of diversity, morphology, anatomy and reproduction of algae, fungi, bryophytes and pteridophytes

Practical (BOT/I/EC/02)	• Demonstrate proficiency in the experimental techniques and methods of appropriate analysis of selected specimen from algae, fungi, bryophytes and pteridophytes
Phanerogams II (BOT/II/EC/03)	• *Knowledge of the general characteristic features, important classification and life history of selected genera of gymnosperms* • *Get learned with the distinguishing features of angiosperm families* • *Understanding of concepts and fundamentals of plant anatomy and embryology* • *Knowhow of the economically important* cereals, pulses, fibers, fats and oils, spices, beverages and timber yielding plants.
Practical(BOT/II/EC/04)	• Gain knowledge in the morphology, anatomy and reproduction of selected genera of gymnosperms through dissection of specimens • Understand the distinguishing features of important angiosperm specimens through dissection and display of their floral parts • Expertise through the dissection of the structure of monocot and dicot (stem, leaf and root), normal and anomalous secondary growth from the available local specimens • Gain knowledge about the ethnobotanically important plants species by collection through field observations
Plant Physiology, Biochemistry and Ecology III (BOT/III/EC/05)	• Understanding plant-water relationship with respect to various physiological processes, mineral nutrition and deficiency symptoms • Acquaintance with basic principles of plant functions, metabolism, cell physiology and principles of growth and development • Comprehends on structure, classification and functions of biomolecules; central dogma of cells • Understand core concepts of population and community characteristics, ecosystem structure and function; critical aspects of pollution

Practical(BOT/III/EC/06)	• Understand the different underlying principles of osmotic potential of cell sap and respiratory quotient through experiments • Knowledge of the biological nitrogen fixation from the study of root nodules • Expertise in the edaphic factors and study of community structures by quadrat method
Microbiology, Cytology, Genetics and Evolution IV (BOT/IV/EC/07)	• Awareness on the history and scope of microbiology and the importance of microbes in various fields • Conceptual understanding of laws of inheritance, genetic basis of linkage and crossing over; genes and their interactions; chromosomal theory of sex determinations • Familiarize with the various concepts of evolution theories
Practical(BOT/IV/EC/08)	• Gain knowledge about the principles of chromatography through amino acid separation experiments • Understanding of the different stages in cell division through slide preparation and observations • Knowledge of the different types of bacteria and chromosome structure by slide observations • Be able to prepare the checkerboards representing the different types of gene interactions
Fungi, Plant Pathology & Biostatistics V(BOT/V/CC/09)	• Identify distinguishing features of fungi, expertise in the classification, understand the evolutionary trends, economic importance and various modes of nutrition in fungi • Familiarize with the terminologies in plant pathology; awareness of the history and scope of plant pathology; get learned with the pathogenic microorganisms and

	their mode of infection and control measures • Acquaintance with the principles and application of plant pathology in the control of selected plant diseases • Recognize the fundamental concepts of biostatistics and its applications in biology
Practical (BOT/V/CC/10)	• Skilled in the identification of important fungal specimens • Knowledge in the study of important plant diseases and their control measures • Expertise in the hypothesis drawing and decision-making of chi-square and students t-test in biological data
Algae, Lichens, Bryophytes VI (BOT/V/CC/11)	• Develop ethical understanding on classification and distinguishing features of major classes of algae and their economic importance • Understand the salient features of lichens and awareness of their economic importance • Knowledge of the general features and important classification of bryophytes, comparative account on important genera and their economic importance
Practical(BOT/V/CC/12)	• Skilled in the identification of selected genera of important algal specimens • Awareness of the locally available lichen specimen through their external and internal study • Get learned with the important genera of bryophytes and fossil specimens through slide observation
Cytogenetics, Plant Breeding and Bioinformatics VII (BOT/V/CC/13)	• Comprehend the effect of chromosomal abnormalities in numerical as well as structural changes leading to genetic disorders, their sources and consequences as well • Knowledge of the types of mutation, mutagens and their actions;

	• Understand the fundamental aspects of plant breeding and get detailed knowledge for the production of new superior crop varieties • Understand the concept of databases and use of different public domain for DNA and protein sequence retrieval
Practical(BOT/V/CC/14)	• Knowledge of the different types of gene interactions using seed samples for demonstration • Gained experience in the quantitative estimation of RNA and DNA through experiment • Understanding of the underlying principles of polyploidy and emasculation and bagging through demonstration • Expertise internet browsing for scientific repositories through hands-on training
Environmental Biology and Ethnobotany VIII (BOT/V/CC/15)	• Knowledge and understanding of plant diversity in terms of structure, function and environmental relationships; • Analyse the causes and effects of depletion of stratospheric ozone layer and awareness of the greenhouse effects • Identify the causes and implications of loss of biodiversity and utilization of various strategies for the conservation of biodiversity; understand the concept of Intellectual property Rights • Critical thinking on endemism and biodiversity hotspot and discovery of vegetation types of India as well as phytogeographical divisions of India • Gain knowledge about various plants of economic use and know about the utility of plant resources
Practical (BOT/V/CC/16)	• Gain knowledge on the natural resources by exploration of reserved forests, biodiversity hotspots regions, national parks, botanical gardens, etc • Critical understanding on the principles of biological oxygen demand and soil organic matter content through experiments • Awareness of the availability and utilization of ethnobotanically important plant

	specimen through field study and herbarium preparations
Pteridophyte, Gymnosperm, Palaeobotany & Palynology (BOT/V/CC/17)	• Develop critical understanding on morphology, anatomy, reproduction and economic importance of pteridophytes and gymnosperms • Grasp knowledge on the comparative study of important genera of pteridophytes and gymnosperms along with their phylogenetic trend and distribution • Knowledge of the scope of palaeobotany, types of fossils and geological time scale, understanding of various fossil genera representing different fossil groups • Awareness of the importance of pollen, its dispersal and role in taxonomy
Practical(BOT/V/CC/18)	• Skilled in the identification of important living genera of selected pteridophytes and gymnosperms through dissection and observation • Awareness of occurrence of fossil specimens of pteridophytes and gymnosperms through slide observation • Gain knowledge of the morphological structure of pollen grains by slide preparation
Angiosperm Taxonomy, Anatomy and Embryology (BOT/V/CC/19)	• Know the conceptual development of taxonomy and systematic and understand the phylogeny of angiosperms and understand various angiosperm plant habit • Get learned with the angiosperm families and its economic value • Recognize the importance of herbarium and botanicals gardens; understand various rules, principles and recommendations of plant nomenclatures and interpret the rules of ICN in botanical nomenclature • Understand the scope and importance of anatomy and embryology • Understand the various components of stem and wood and its secondary growth • Be enlightened about the mechanism of pollination and basic structure of the embryo
Practical (BOT/V/CC/20)	• Expertise in the preparation of herbarium and its monitoring • Gain knowledge of the distinguishing features of important angiosperm families

	through dissection and display of their floral parts • Knowledge of the internal structure of plants through dissection and study of the anomalous secondary growth and ecological adaptations in hydrophytes and xerophytes • Familiarize with the process of fertilization through permanent slide observation of its important components and germination of pollen grains study by slide preparation
Plant Metabolism, Biochemistry and Thermodynamics (BOT/V/CC/21)	• Comprehends on the account, synthesis and metabolism of important biomolecules. • Follow protein chemistry and basic aspects of enzymology • Understanding the biosynthesis and mode of action of plant growth hormones. • Competency in basics of energy transformations during photosynthesis, means of electron transport and mechanism of ATP synthesis. • Introduction to thermodynamics laws and aspects of bioenergetics.
Practical (BOT/V/CC/22)	• Understand the distribution of protein in plant materials by quantitative estimation through experiment • Knowledge of the principles of photosynthesis through experiment • Skilled in the extraction and separation of plant pigments by paper chromatography • Gain knowledge on mechanism of enzyme action through experiment
Plant Biotechnology and Experimental Embryology (BOT/V/CC/23)	• Understand the micropropagation methods and hands on experience to students • Learn the basic concept of plant tissue culture and somatic embryogenesis • Understand the principle and basic protocols for plant tissue culture • Knowledge of the recent development of genetically modified crops
Practical (BOT/V/CC/24)	• Skilled in the preparation of different media for tissue culture techniques • Gained knowledge on the basic principles of genetic engineering through

	photographs and demonstration • Expertise in the knowledge of Southern, Northern and Western blotting through demonstration • Experienced in the project works and report writing in the related subject
Program Outcomes	• Knowledge and understanding about plant diversity • Presentation skills (oral & writing) in life sciences • Scientific knowledge in life science and fundamental metabolism of plants • Knowledge about biodiversity exploration, estimation and conservation • Knowledge about various plant groups from primitive to highly evolved • Awareness of applications of different plants in various industries • Equipped the students with skills related to laboratory as well as field-based studies • Awareness about conservation and sustainable use of plants
Program Specific Outcomes	• Inculcate strong fundamentals on modern and classical aspects of Botany • Stewardship responsibility • Hands on expertise in biological sciences • Entrepreneurship skill development • Will be able to clear competitive examinations like State/Central Services • Create platform for higher studies in Botany • Facilitate students to take-up successful career in Botany

	• Career opportunities and job opportunities in both Government and private sectors • Become focussed to take up Research and Teaching opportunities

Department of Chemistry	
Program Outcome	• Students will acquire knowledge on the fundamental concepts, principles and processes underlying the academic field of chemistry; employing critical thinking and scientific method to design, conduct chemical experiment, record and analyse the results in a systematic way. • Students will understand the role of chemistry as a multidisciplinary and its linkages with related disciplinary areas/subjects; also get an awareness of the role of chemistry on the environment and the society.
Program Specific Outcome	The ability to explain chemical nomenclature, structure, reactivity and mechanism involved in the field of chemistry with their applications in the scientific community. The design and execution of the experiment demonstrate an understanding of well-equipped laboratory and the proper handling of chemical waste streams and also explain how the applications of Chemistry relates to the everyday life.
Course Outcome	
Course	**Outcome**
Paper-I(Inorganic Chemistry-I)	To enable the students to learn the basic concept of atomic structure, Periodic properties of elements, chemical bonding, coordination compounds and nuclear chemistry.
Paper-II(Organic Chemistry-I)	To have well understanding of Organic reaction mechanisms, Aromaticity, organic functional groups, substitution and elimination reactions.
Paper-III(Physical	To acquire knowledge on liquid and Gaseous state, Colloids and surface Chemistry, dissociation equilibria and

Chemistry-I)	Chemical thermodynamics.
Paper-IV(Analytical Chemistry-I)	Enable the students to learn safety and hygiene in the laboratory, chemical separation method, volumetric and gravimetric analysis with method of evaluation of these experimental data.
Paper-V(Inorganic Chemistry-II)	Students will have better understanding of chemical bonding with different approach, properties of s and p block elements, acid-base concept, non-aqueous solvent, molecular symmetry, transition elements, VBT and CFT concept.
Paper-VI(Organic Chemistry-II)	Students to learn about Stereochemistry, conformations, heterocyclic compounds and organic synthesis named reactions along with molecular rearrangement.
Paper-VII(Physical Chemistry-II)	Students will have understanding on solid and gaseous state of matter, catalysis, chemical kinetics, thermodynamics concept and electrochemistry.
Paper-VIII(A): Skill based subject:(Analytical Chemistry-II)	Students will learn techniques in chemical separation method, electrogravimetric method, thermal method and Spectrochemical method for qualitative and quantitative analysis.
Paper-VIII(B): Skill based subject:(Industrial Chemistry)	To enable the students to learn about technology in fermentation, food science, leather, explosives, polymers, fertilizers and textile industry.
Paper-IX (Inorganic Chemistry-III)	Provide students with better understanding of organometallic compounds, Bio-inorganic molecules, inorganic polymers, magnetic materials with applications of
Paper-X(Organic Chemistry-III)	Students will acquire knowledge in organic photochemistry, Pericyclic reactions, organometallic compounds, the 12 principles of green chemistry applications of mass and NMR spectroscopy.
Paper-XI((Physical Chemistry-III)	Enable the students to understand quantum mechanics, statistical thermodynamics, theory of molecular spectroscopy and electrochemistry viz. EMF, concentration cells and quantitative application of potentiometric titrations.
Paper-XII(A): Skill based subject:(Material Chemistry)	Offers better understanding of material science viz. macromolecules, nanomaterials and hybrid materials.

Paper-XII(B): Skill based subject:(Natural Products)	Students will have skills in extraction, biosynthesis and separation of secondary metabolites from plants and in-depth knowledge of stereochemistry and molecular rearrangement of natural products.

Department of Environmental Science (Under Graduate)		
Programme Outcome – • The programme will make the students to have sustainable thoughts about the environment. They will also pursue eco-friendly measures in their lives posing less pollution and conserve resources.		
Programme Specific Outcome – • On the successful completion of the Programme the students will be able to involve themselves in environmental conservation. They will understand the value of nature and become responsible stakeholders in the future. • This programme incorporates an in-depth socio-economic front which will allow them to be involved in several jobs. After the completion of the program they will be sufficiently absorbed in industry, academics, research, and non-profit bodies. They will also be fit for several competitive exams and many other entrepreneurial openings.		
Course Outcomes		
Course code	**Name of Course**	**Outcomes**
Course-I/ EVS-101	Fundamentals of Environmental Science	• It enables students to understand the fundamental concepts of the environment
Course-II/EVS-102	Fundamentals of Environmental Science (Practical)	• It helps students get hands-on skills to analyse the different environmental parameters
Course-III/ EVS-201	Natural Resources	• It helps students understand the importance of natural resources and its conservation
Course – IV/EVS-202	Natural Resources (Practical)	• It provides students real-life experience on how natural resources may be conserved
Course-V/ EVS-301	Environmental Pollution	• It provides students to understand the state of environment degradation
Course-VI/ EVS-	Environmental Pollution	• This course provides students to check and analyse the degree of pollution in different environmental

302	(Practical)	matrices
Course-VII/ EVS-401	Environmental Monitoring and Control Technology	• Students will understand the latest monitoring techniques in the field of environmental pollution and safety
Course-VIII/ EVS-402	Environmental Monitoring and Control Technology (Practical)	• It will provide students hands-on experience on techniques pertaining to environment monitoring and control measures.
Course-IX/ EVS-501	Biodiversity and Sustainable Development	• After the completion of this paper the student understands different plants and animal diversity along with sustainable developmental approaches.
Course-X/ EVS-502	Biodiversity and Sustainable Development (Practical)	• It enables the skill of students to analyse different biodiversity parameters and practical visit will enable the student to have a better understanding of nature.
Course-XI/ EVS-503	Environmental Biology	• This paper will provide learners to link biology in the broader context of environment.
Course-XII/EVS-504	Environmental Biology (Practical)	• The students will get a chance to work practically on biological parameters of the environment
Course-XIII/ EVS-505	Environmental Chemistry	• It helps students recognize the basic chemistry and constituents of the air, water, soil, etc.
Course-XIV/ EVS-506	Environmental Chemistry (Practical)	• This paper will provide learners to get informed on practical issues like chemical tests and analyses on environmental matrices
Course-XV/ EVS-507	Environmental Issues, Geoscience and Remote Sensing	• This paper will provide knowledge on environmental issues and open a new horizon to students about state-of-the-art technologies in the arena of GIS and RS.
Course-XVI/ EVS-508	Environmental Issues, Geoscience and Remote Sensing (Practical)	• Students will get hands-on experience on handling software and tools on GIS-RS
Course-XVII/ EVS-601	Environmental Toxicology and Health	• Students will benefit from this course by learning latest health and epidemiological issues spreading from degrading environment
Course-XVIII/ EVS-602	Environmental Toxicology and Health (Practical)	• This paper will help students to analyse the level of toxicity and health issues
Course-XIX/ EVS-603	Environmental Statistics and Computer	• This paper will provide the knowledge on data analyses and computer application in Environmental Science

	Applications	
Course-XX/ EVS-604	Environmental Statistics and Computer Applications (Practical)	• In this paper the students will develop the skill of handling computers and using the statistical tools
Course-XXI/ EVS-605	Environmental Assessment and Legislations	• It will give the knowledge to students on different laws and legislation related to the environment
Course-XXII/ EVS-606	Environmental Assessment and Legislations (Practical)	• Students will develop the skill to assess the environmental impact and make people aware about the legislation on environmental issues
Course-XXIII/ EVS-607	Environmental Management and Protection	• This paper will give knowledge about best management of environment for future generation
Course-XXIV/ EVS-608	Dissertation	• In this paper students will get the knowledge and skill to write the report and presenting the findings of the project work.

DEPARTMENT OF GEOLOGY	
Course Outcomes	
Courses	***Outcomes***
General & Structural Geology & Mineralogy (GEOL/CC/101)	• The study of this paper strengthens students' knowledge with respect to understanding the essentials of the structural dynamics of the earth, to convey the basic and scope of geology • It provides knowledge of the geometry of the rock structures, understand the mechanism of the evolution of rock structures and its application in the field. • It enables students to understand the basics of mineralogy and crystallography which helps in understanding and building the overall knowledge in Geology
Practical (GEOL/CC/102)	• Enables students to understand structural problems with the help of geological equipments • Helps in understanding the structures and dynamics of the Earth, elements of crystal and the megascopic and microscopic properties of common minerals
Petrology & Geochemistry (GEOL/CC/201)	• Enables in understanding the processes involved in the formation of igneous, sedimentary and metamorphic rocks, their textures, structures, compositions, classifications and their importance.
Practical (GEOL/CC/202)	• To develop students ability in learning the megascopic and microscopic properties of the rocks

	using hand specimen and microscope • Helps in preparation and interpretation of geochemical map
Stratigraphy & Paleontology (GEOL/CC/301)	• Encompasses the aspects of the age of the earth time, correlation, and paleontology would enable the students to understand the changes that occurred in the history of the earth and relate them to their field observations and also, in understanding the framework of the stratigraphy
Practical (GEOL/CC/302)	• Expose the students in understanding the litho-stratigraphic maps and helps in preparation of physiographic maps • Helps in understanding the modes of preservation of fossils and in understanding their systematic classification
Economic & Applied Geology (GEOL/CC/401)	• Techniques of mineral exploration and exploitation, estimation of ore reserves, their classification and processes of formation, techniques and methods of mining and their environmental impact, and the importance conservation of mineral resources. • Helps in gaining an understanding the hydrogeological concepts, exploration, exploitation and recharge of groundwater, their distribution and methods of monitoring groundwater quality and sources of pollution • Aware the importance of geological studies and its applicability to various engineering problems and enables the students to have the elementary idea of photo-geology and its interpretation and to understand the basics of remote sensing
Practical (GEOL/CC/402)	• Helps the students in exercising on interpretation of geological and geophysical data and in map preparation and interpretation. • Enables the students in using GIS software
Applied and Engineering Geology (GEOL/CC/501)	• Aware of the importance of geological studies and its applicability to various engineering problems. Also helps in measuring and calculations of different structural problems. • Generates the elementary idea of photo-geology and its interpretation and to understand the basics of remote sensing and basic principles, applications and used of GIS
Practical (GEOL/CC/502)	• Helps in slope analysis, preparation and interpretation of aerial photographs, use of chain and table survey, and use of GIS.
Sedimentology & Sequence	• Helps in understanding the classification, processes, textures, provenance and structures of

Stratigraphy(GEOL/CC/503)	sedimentary rocks, and also provide knowledge on tectonics and sedimentation, facies concept and sequence stratigraphy.
Practical(GEOL/CC/504)	• Provides megascopic and microscopic studies on sedimentary rocks and plots on a triangular graph
Igneous & Metamorphic Petrology (GEOL/CC/505)	• Emphasize in understanding the processes involved in the formation, classification, graphical representation of igneous and metamorphic rocks and their textures and structures,
Practical (GEOL/CC/506)	• To develop students ability in learning the megascopic and microscopic properties of the rocks using hand specimen and microscope
Hydrogeology, Oceanography & Environmental Geology (GEOL/CC/507)	• For gaining an understanding of hydrogeological concepts, exploration, exploitation and recharge of groundwater and methods of monitoring groundwater quality and sources of pollution • Basic concepts of oceanography and marine geology with respect to geology as to enable them to work as a marine researcher. • Helps them in understanding the environmental geology
Practical (GEOL/CC/508)	• Exercising students on plotting ocean currents, hydrogeological maps and also interpretation on environmental impact.
Geology of North East India (GEOL/CC/509)	• Gives information on geographical, Geotectonic and Morpho-tectonic setup of North East India, Geology of Mizoram, seismo-tectonics of North East part of India.
Practical (GEOL/CC/510)	• Provides information on important rocks of Mizoram and also preperation of seismic hazards map of North East India
Paleontology and Stratigraphy (GEOL/CC/601)	• Encompasses the aspects of the age of the earth time, correlation, and paleontology would enable the students to understand the changes that occurred in the history of the earth and relate them to their field observations and also, in understanding the framework of the stratigraphy
Practical (GEOL/CC/602)	• Expose the students in understanding the litho-stratigraphic maps and helps in preparation of physiographic maps • Helps in understanding the modes of preservation of fossils and in understanding their systematic classification
Economic Geology & Mineral Resources of India (GEOL/CC/603)	• it helps the students in understanding the processes, occurrences, forms, structures, metallogenic provinces and epochs of different ore deposits and economic minerals in India and also an idea on conventional and non-conventional sources of energy.

Practical (GEOL/CC/604)	• provides the study of ore and economic minerals and their distribution using map
Dynamics of The Earth & Structural Geology (GEOL/CC/605)	• The study of this paper strengthens students' knowledge with respect to understanding the essentials of the structural dynamics of the earth, basic on seismology and seismic zone of India • It provides knowledge of the geometry of the rock structures, understand the mechanism of the evolution of rock structures and its application in the field
Practical (GEOL/CC/606)	• Helps student to understand structural problems with the help of geological equipments • Helps in understanding the structures and dynamics of the Earth. Direct the students in stereographic projection. • Helps in Interpretation of seismogram, half-life calculation and problems on drainage system
Fuel Geology & Mineral Exploration (GEOL/CC/607)	• Emphasize knowledge on petroleum and coal origin, classification, occurrence, reserves and distribution in India. • Provides different methods and techniques on geophysical and geochemical exploration.
Practical (GEOL/CC/608)	• It practice the students in preparation of different geochemical and geophysical map and distribution of petroleum and coal deposits map in India
Environmental Geology (GEOL/CC/609)	• Provides knowledge on climatology, environment and prevention and mitigation on different geo-hazards.
Practical (GEOL/CC/610)	• It helps the students in interpreting environmental impact from field data and preparation of seismic map of India

DEPARTMENT OF MATHEMATICS

I. COURSE OUTCOMES

MATH/1/CC/111 Calculus	• Assimilate the notions of limit of a sequence and convergence of a series of real numbers. • Calculate the limit and examine the continuity of a function at a point.

	• Understand the consequences of various mean value theorems for differentiable functions. • Sketch curves in Cartesian and polar coordinate systems. • Applyderivativetestsinoptimizationproblemsappearinginsocialsciences, physical sciences, life sciences and a host of other disciplines.
MATH/2/CC/121 Algebra	• Recognize the mathematical objects called groups. • Link the fundamental concepts of groups and symmetries of geometrical objects. • Explain the significance of the notions of cosets, normal subgroups, and factor groups. • Analyze consequences of Lagrange's theorem. • Learnaboutstructurepreservingmapsbetweengroupsandtheirconsequences.
MATH/3/CC/231 Differential Equation	• Understand the genesis of ordinary differential equations. • Learnvarioustechniquesofgettingexactsolutionsofsolvablefirstorderdifferential equations and linear differential equations of higher order. • Know Picard's method of obtaining successive approximations of solutions of first order differential equations, passing through a given point in the plane and Power series method for higher order linear equations, especially in cases when there is no method available to solve such equations. • Graspthecconceptofageneralsolutionofalineardifferentialequationofanarbitrary orderandalsolearnafewmethodstoobtainthegeneralsolutionofsuchequations. • Formulate mathematical models in the form of ordinary differential equations to suggest possible solutions of the day to day problems arising in physical, chemical and biological disciplines.
MATH/4/CC/241 Vector Calculus and Solid Geometry	• Understand the properties of three dimensional shapes. • Find the position of a particle in space. • Find the section of conics.
MATH/5/CC/351Computer Oriented Numerical	• Obtain numerical solutions of algebraic and transcendental equations.

Analysis	• Find numerical solutions of system of linear equations and check the accuracy of the solutions. • Learn about various interpolating and extrapolating methods. • Solve initial and boundary value problems in differential equations using numerical methods. • Apply various numerical methods in real life problems.
MATH/5/CC/352 Real Analysis	• Understand many properties of the real line and learn to define sequence in terms of functions from R to a subset of R. • Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior, and the limit of a bounded sequence. • Apply the ratio, root, alternating series and limit comparison tests for convergence and absolute convergence of an infinite series of real numbers. • Learn some of the properties of Riemann integrable functions, and the applications of the fundamental theorems of integration.
MATH/5/CC/353 Complex Analysis	• Understand the significance of differentiability and analyticity of complex functions leading to the Cauchy Riemann equations. • Learn the role of Cauchy Goursat theorem and Cauchy integral formula in evaluation of contour integrals. • Apply Liouville's theorem in fundamental theorem of algebra. • Understand the convergence, term by term integration and differentiation of a power series. • Learn Taylor and Laurent series expansions of analytic functions, classify the nature of singularity, poles and residues and application of Cauchy Residue theorem.
MATH/5/CC/354(C) Computer Programming in Fortran	• Have complete knowledge of FORTRAN language. • Identify situations where computational methods and computers would be useful. • Given a computational problem, identify and abstractthe programming task involved. • Choose the right data representation formats based on the requirements of the problem.
Practical	• Write the program on a computer, edit, compile, debug, correct, recompile and run it.
MATH/6/CC/361 Modern Algebra	• Understand the basic concepts of group actions and their applications. • Know the fundamental concepts in ring theory such as the concepts of ideals, quotient rings, integral

	domains, and fields. • Learn in detail about polynomial rings, fundamental properties of finite field extensions, and classification of finite fields.
MATH/6/CC/362 Advanced Calculus	• Learn conceptual variations while advancing from one variable to several variables in calculus. • Apply multivariable calculus in optimization problems. • Inter-relationship amongst the line integral, double and triple integral formulations. • Applications of multivariable calculus tools in physics, economics, optimization and understanding the architecture of curves and surfaces in plane and space etc. • Realize importance of Green, Gauss and Stokes' theorems in other branches of mathematics.
MATH/6/CC/363 Mechanics	• Familiarize with subject matter, which has been the single centre, to which were drawn mathematicians, physicists, astronomers, and engineers together. • Understand necessary conditions for the equilibrium of particles acted upon by various forces and learn the principle of virtual work for a system of coplanar forces acting on a rigid body. • Determine the centre of gravity of some materialistic systems and discuss the equilibrium of a uniform cable hanging freely under its own weight. • Deal with the kinematics and kinetics of the rectilinear and planar motions of a particle including the constrained oscillatory motions of particles.
MATH/6/CC/364(C) Computer Programming in C	• Have complete knowledge of C language. • Identify situations where computational methods and computers would be useful. • Given a computational problem, identify and abstractthe programming task involved. • Choose the right data representation formats based on the requirements of the problem.
Practical	Write the program on a computer, edit, compile, debug, correct, recompile and run it.

II. PROGRAMME OUTCOMES

A student who had studied this course would develop a broad and balanced knowledge of undergraduate mathematics.

He/she would understand the definitions, concepts, principles and theorems in Mathematics. He/she would be familiarized with suitable tools of mathematical analysis to handle issues and problems in mathematics and related sciences. He/she would be equipped with the knowledge and skills acquired during the course to solve specific theoretical and applied problems in mathematics.

III. PROGRAMME SPECIFIC OUTCOMES

This programme will provide the student sufficient knowledge and skills enabling him/her to undertake further studies in mathematics and its allied areas on multiple disciplines concerned with mathematics. This programme will also enrich the student to develop a range of generic skills helpful in employment, internships and social activities.

Department of Physics

1. Introduction

The undergraduate programs in Physics is intended to provide a broad framework which helps to create an academic base that responds to the need of the students to understand the basics of Physics and its ever evolving nature of applications in explaining all the observed natural phenomenon as well as predicting the future applications to the new phenomenon with a global perspective. The curriculum framework is designed and formulated in order to acquire and maintain standards of achievement in terms of knowledge, understanding and skills in Physics and their applications to the natural phenomenon as well as the development of scientific attitudes and values appropriate for rational reasoning, critical thinking and developing skills for problem solving and initiating research which are competitive globally.

The process of learning is defined by following steps which forms the basis of final assessment of the achievement at the end of the program.

- The accumulation of facts of nature and the ability to link the facts to observe and discover the laws of nature i.e. develop an understanding and knowledge of the basic Physics.
- The ability to use this knowledge to analyze new situations and learn skills and tools like mathematics, engineering and technology to find the solution, interpret the results and make predictions for the future developments.

- The ability to synthesize the acquired knowledge, understanding and experience for a better and improved comprehension of the physical problems in nature and to create new skills and tools for their possible solutions.

2.1 Nature and extent of UG program in Physics:

The UG programs in Physics builds on the basic Physics taught at the +2 level in all the schools in the country. Ideally, the +2 senior secondary school education should aim and achieve a sound
grounding in understanding the basic Physics with sufficient content of topics from modern Physics and contemporary areas of exciting developments in physical sciences to ignite the young minds. The curricula and syllabi should be framed and implemented in such a way that the basic connection between theory and experiment and its importance in understanding Physics should be apparent to the student. This is very critical in developing a scientific temperament and urge to innovate, create and discover in Physics. Unfortunately the condition of our school system in most parts of the country lacks the facilities to achieve the above goal and it is incumbent upon the college/university system to fill the gaps in the knowledge creation of our young minds created by the lack of infrastructural and academic resources of our school system and strengthen their understanding in all the subjects through the UG programs specially in Physics and other science subjects.

2.2 Aims of UG program in Physics.

The aims and objectives of our UG educational programs in Physics is structured to create the facilities and environment to consolidate the knowledge acquired at +2 level and to motivate and inspire the students to create deep interest in Physics, to develop broad and balanced knowledge and understanding of physical concepts, principles and theories of Physics.

- learn, design and perform experiments in the labs to demonstrate the concepts, principles and theories learned in the classrooms.
- develop the ability to apply the knowledge acquired in the classroom and laboratories to specific problems in theoretical and experimental Physics.
- expose the student to the vast scope of Physics as a theoretical and experimental science with applications in solving most of the problems in nature spanning from 10-15 m to 1026m in space and 10-10 eV to 1025eV in energy dimensions.
- emphasize the discipline of Physics to be the most important branch of science for pursuing the interdisciplinary and multidisciplinary higher education and/or research in interdisciplinary and multidisciplinary areas.
- to emphasize the importance of Physics as the most important discipline for sustaining the existing industries and establishing new ones to create job opportunities at all levels of employment.

3. Graduate attributes in Physics

Some of the characteristic attributes of a graduate in Physics are

- **Disciplinary knowledge and skills:** Capable of demonstrating

(i) good knowledge and understanding of major concepts, theoretical principles and experimental findings in Physics and its different subfields like Material science, Nuclear and Particle Physics, Condensed matter Physics, Atomic and Molecular Physics, Mathematical Physics and other related fields of study, including broader interdisciplinary subfields like Chemistry, Mathematics, Life sciences, Environmental sciences, Computer science, Information Technology etc.

(ii) ability to use modern instrumentation and laboratory techniques to design and perform experiments is highly desirable in almost all the fields of physics.

- **Skilled communicator:** Ability to transmit complex technical information relating all areas in Physics in a clear and concise manner in writing and oral ability to present complex and technical concepts in a simple language for better understanding.
- **Critical thinker and problem solver:** Ability to employ critical thinking and efficient problem solving skills in all the basic areas of Physics.
- **Sense of inquiry:** Capability for asking relevant/appropriate questions relating to the issues and problems in the field of Physics, planning, executing and reporting the results of a theoretical or experimental investigation.
- **Team player/worker**: Capable of working effectively in diverse teams in both classroom laboratory, Physics workshop and in industry and field-based situations.
- **Skilled project manager:** Capable of identifying/mobilizing appropriate resources required for a project, and manage a project through to completion, while observing responsible and ethical scientific conduct.
- **Digitally Efficient*:*** Capable of using computers for simulation studies in Physics and computation and appropriate software for numerical and statistical analysis of data.
- **Ethical awareness / reasoning*:*** The graduate should be capable of demonstrating ability to think and analyze rationally with modern and scientific outlook and identify ethical issues related to one's work, avoid unethical behavior such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights, and adopting objectives, unbiased and truthful actions in all aspects of work.
- **National and international perspective*:*** The graduates should be able to develop a national as well as international perspective for their career in the chosen field of the academic activities. They should prepare themselves during their most formative years for their appropriate role in contributing towards the national development and projecting our national priorities at the international level pertaining to their field of interest and future expertise.
- **Lifelong learners:** Capable of self-paced and self-directed learning aimed at personal development and for improving knowledge/skill development and reskilling in all areas of Physics.

4. Qualification descriptors for a UG programs in Physics

The qualification descriptors for a B.Sc(Honours) Physics Program includes the following.

The graduates should be able to:

- Demonstrate

(i) a systematic, extensive and coherent knowledge and understanding of the academic field of study as a whole and its applications, and links to related disciplinary areas/subjects of study; including a critical understanding of the established theories, principles and concepts, and of a number of advanced and emerging issues in the field of Physics.

(ii) procedural knowledge that creates different types of professionals related to the subject area of Physics, including research and development, teaching and government and public service.

(iii) skills in areas related to one's specialization area and current developments in the academic field of Physics, including a critical understanding of the latest developments in the area of specialization, and an ability to use established techniques of analysis and enquiry within the area of specialization.

- Demonstrate comprehensive knowledge about materials, including current research, scholarly, and/or professional literature, relating to essential and advanced learning areas pertaining to various subfields in Physics, and techniques and skills required for identifying Physics problems and issues in their area of specialization in Physics.
- Demonstrate skills in identifying information needs, collection of relevant quantitative and/or qualitative data drawing on a wide range of sources from the Physics labs around the world, analysis and interpretation of data using methodologies as appropriate to the subject of Physics in the area of his specialization.
- Use knowledge, understanding and skills in Physics for critical assessment of a wide range of ideas and complex problems and issues relating to the various sub fields of Physics.
- Communicate the results of studies undertaken in the academic field of Physics accurately in a range of different contexts using the main concepts, constructs and techniques of the subject of Physics;
- Address one's own learning needs relating to current and emerging areas of study relating to Physics, making use of research, development and professional materials as appropriate, including those related to new frontiers of knowledge in Physics.
- Apply one's knowledge and understandings relating to Physics and skills to new/unfamiliar contexts and to identify and analyze problems and issues and seek solutions to real-life problems.
- Demonstrate subject-related and transferable skills that are relevant to some of the Physics related jobs and employment opportunities.

5. Programme learning outcomes relating to B.Sc Courses in Physics

The student graduating with the Degree B.Sc (Honours) Physics should be able to

- Acquire

(i) a fundamental/systematic or coherent understanding of the academic field of Physics, its different learning areas and applications in basic Physics like Astrophysics, Material science, Nuclear and Particle Physics, Condensed matter Physics, Atomic and Molecular Physics, Mathematical Physics, Analytical dynamics, Space science, and its linkages with related disciplinary areas/subjects like Chemistry, Mathematics, Life sciences, Environmental sciences, Atmospheric Physics, Computer science, Information Technology;

(ii) procedural knowledge that creates different types of professionals related to the disciplinary/subject area of Physics, including professionals engaged in research and development, teaching and government/public service;

(iii) skills in areas related to one's specialization area within the disciplinary/subject area of Physics and current and emerging developments inthe field of Physics.

- Demonstrate the ability to use skills in Physics and its related areas of technology for formulating and tackling Physics-related problems and identifying and applying appropriate physical principles and methodologies to solve a wide range of problems associated with Physics.
- Recognize the importance of mathematical modeling simulation and computing, and the role of approximation and mathematical approaches to describing the physical world.
- Plan and execute Physics-related experiments or investigations, analyze and interpret data/information collected using appropriate methods, including the use of appropriate software such as programming languages and purpose-written packages, and report accurately the findings of the experiment/investigations while relating the conclusions/findings to relevant theories of Physics.
- Demonstrate relevant generic skills and global competencies such as

(i) problem-solving skills that are required to solve different types of Physics-related problems with well-defined solutions, and tackle open-ended problems that belong to the disciplinary area boundaries;

(ii) investigative skills, including skills of independent investigation of Physics-related issues and problems;

(iii) communication skills involving the ability to listen carefully, to read texts and research papers analytically and to present complex information in a concise manner to different groups/audiences of technical or popular nature;

(iv) analytical skills involving paying attention to detail and ability to construct logical arguments using correct technical language related to Physics and ability to translate them with popular language when needed;

(v) ICT skills;

(vi) personal skills such as the ability to work both independently and in a group.

- Demonstrate professional behavior such as

(i) being objective, unbiased and truthful in all aspects of work and avoiding unethical, irrational behavior such as fabricating, falsifying or misrepresenting data or committing plagiarism;

(ii) the ability to identify the potential ethical issues in work-related situations;

(iii) appreciation of intellectual property, environmental and sustainability issues; and

Teaching Learning Processes

The teaching learning processes play the most important role in achieving the desired aims and objectives of the undergraduate programs in physics. Physics is basically an experimental science as any ideas and concepts, no matter how simple, complex or far-fetched have to be tested in the laboratory by performing specific experiments designed to test, validate and confirm them before they are accepted as principles of Physics applicable to natural phenomenon. While such ideas and concepts originate in the minds of the genius, anywhere and anytime in the universe, their verifications and confirmations have to be done in the laboratory established in the real world and executed by competent and well trained scientists and engineers. To achieve this goal, the appropriate training of young individuals to become competent scientists and engineers in future have to be accomplished. For this purpose a very good undergraduate program in Physics and other sciences is the first step. We should therefore have an excellent teaching-learning procedural protocol.

To be specific, it is desirable to have:

- Necessary and sufficient infrastructural facilities for the class rooms, laboratories and libraries equipped with adequate modern and modular furnitures and other requirements.
- Modern and updated laboratory equipments needed for the undergraduate laboratories and reference and text books for the libraries.
- Sufficient infrastructure for ICT and other facilities needed for technology-enabled learning like computer facilities, PCs, laptops, Wi-Fi and internet facilities with all the necessary softwares.
- Sufficient number of teachers in permanent position to do all the class room teaching and perform and supervise the laboratory experiments to be done by the students.
- All the teachers should be qualified as per the UGC norms and should have good communication skills.
- Sufficient number of technical and other support staff to run the laboratories, libraries, equipment and maintain the infrastructural facilities like buildings, electricity, sanitation, cleanliness etc.
- Teachers should make use of all the approaches for an efficient teaching-learning process i.e. :

i). Class room teachings with lectures using traditional as well as electronic boards.

ii). Use of Smart class rooms for simulation and demonstration for conveying the difficult concepts of Physics in class room teaching and laboratories.

iii). Tutorials must be an integral part of all the theory and laboratory courses. Theory courses should have 1-2 tutorials every week depending upon the nature of the course.

iv). Teaching should be complimented with students seminar to be organized very frequently.

v). Guest lectures and seminars should be arranged by eminent teachers to be invited by the concerned college/university/HEI.

vi). Open-ended project work should be given to all students individually or in group to 2-3 students depending upon the nature of the course.

vii). Internship of duration varying from one week anytime in the semester and/or 2-6 weeks during semester break and summer breaks should be arranged by the college/universities/HEI for the students to visit other colleges/universities/HEI and industrial organizations in the

Sem	Course	Name of the paper	Course Output

vicinity. If needed, financial assistance may also be provided for such arrangements to be made for their internship in the National Laboratories in the region of the institutions.

viii). Special attempts should be made by the institution to develop problem-solving skills and design of laboratory experiments for demonstration at the UG level. For this purpose a mentor system may be evolved where 3-4 students may be assigned to each faculty member.

ix). Teaching load should be managed such that the teacher has enough time to interact with the students to encourage an interactive/participative learning.

I	Phy/I/ EC/01	Properties of Matter, Oscillations and Acoustics	After going through this course, students should be 1. Understand laws of motion and their application to various dynamical situations, notion of inertial frames and concept of Galilean invariance. Understanding the concept of conservation of energy, momentum, angular momentum and apply them to basic problems. 2. Understand the analogy between translational and rotational dynamics, and their applications. Write the expression for the moment of inertia about the given axis of symmetry for different uniform mass distributions. 3. Understand the principles of elasticity through the study of Young Modulus and modulus of rigidity. Understand simple principles of fluid flow and the equations governing fluid dynamics. 4. Explain the phenomena of simple harmonic motion and the properties of systems executing such motions. 5. Describe special relativistic effects and their effects on the mass and energy of a moving object and appreciate the nuances of Special Theory of Relativity
	Phy/I/ EC/01	Laboratory-1	In the laboratory course, the student shall perform experiments related rotational dynamics (Flywheel), elastic properties by Searle's method (Young Modulus and Modulus of Rigidity) and fluid dynamics (capillarity, surface tension and viscosity) etc. The students are also demonstrated the experiments related to simple harmonic motion (bar pendulum) and vibration of strings (tuning fork, sonometer)
II	Phy/II/ EC/03	Thermodynamics and Mathematical Physics-I	1. Learn the basic aspects of kinetic theory of gases, equipartition of energy, specific heat. Learn about ideal and real gas equations (Van der Waal equation of state). 2. Comprehend the basic concepts of thermodynamics, zeroth, first and second law of thermodynamics, the concept of entropy and Carnot's engine. Learn about Maxwell's thermodynamic relations. 3. Learn the basic mathematical structures essential for solving problems in various branches of Physics as well as in engineering. Revise the knowledge of vector algebra, vector calculus and matrices. Learn basic idea about tensors. 4. Learn the curvilinear coordinates which have applications in problems with spherical and cylindrical symmetries. 5. Learn about special functions such as beta and gamma functions and their uses.
	Phy/II/ EC/04	Laboratory-2	In the laboratory course, the students are expected to do some basic experiments in thermal Physics, viz., Determination of coefficient of linear expansion of a rod, specific heat of a liquid by the method of cooling, pressure coefficient by using a constant volume thermometer and coefficient of apparent expansion of a liquid etc. The students are also demonstrated the experiments related to magnetic field, viz., determination of angle of dip, verification of inverse square law in magnetism and determination of H and M.
Sem	**Course**	**Name of the paper**	**Course Output**
			After going through this course, students must

III	Phy/III/ EC/05	Electromagnetism and Optics	1. Understand basic laws of electricity and magnetism, viz., Coulomb's law, Gauss law and apply it to systems of point charges as well as line, surface, and volume distributions of charges. Apply Gauss's law of electrostatics to solve a variety of problems. 2. Articulate knowledge of electric current, resistance and capacitance in terms of electric field and electric potential. Understand the principals of capacitors and their uses.. 3. Apply Kirchhoff's rules to analyze AC circuits, apply various network theorems such as Superposition, Thevenin, Norton, Reciprocity, Maximum Power Transfer, etc. and their applications in electronics, electrical circuit analysis, and electrical machines. 4. Understand basic knowledge of principles and theories of light and its behavior. Understand the principle of superposition of waves and Explain phenomena like polarisation, interference and diffraction. Understand the working of selected optical instruments like biprism, interferometer and diffraction grating.
	Phy/III/ EC/06	Laboratory-3	In the laboratory course, student will demonstrate image formation in lenses and verify laws of combination of lenses, magnifying power of telescope etc. Students will also learn to measure unknown resistance using Post office box, carey-foster bridge etc. They should be able to verify various circuit laws, network theorems using simple electric circuits.
IV	Phy/IV/ EC/07	Atomic, Nuclear Physics-I and Solid State Physics-I	This course should enable the students to 1. Understand the properties of nuclei like density, size, binding energy, nuclear forces and structure of atomic nucleus. 2. Calculate the decay rates and lifetime of radioactive decays like alpha, beta, gamma decay and understand fission and fusion well as nuclear processes to produce nuclear energy in nuclear reactor and stellar energy in stars. 3. Understand different forms of solids: crystalline and amorphous, about lattice, unit cell, miller indices, reciprocal lattice, concept of Brillouin zones and diffraction of X-rays. 4. Understand lattice vibrations, phonons and knowledge of Einstein and Debye theory of specific heat of solids. Differentiate diamagnetism, paramagnetism and ferromagnetism. Understand band theory of solids and must be able to differentiate insulators, conductors and semiconductors.
	Phy/IV/ EC/08	Laboratory-4	In the laboratory course, the students will study characteristics curves of semiconductor diode, Zener diode and various transistor characteristics (static and dynamic). They will also determine the energy gap in a Semiconductor diode and study the various Transistor biasing configurations.

Sem	Course	Name of the	Course Output

		paper	
V	Phy/V/ CC/09	Mathematical Physics-II	1. Learn about complex variables and associated theories and use of residue theorem in solving integrals. 2. Acquire knowledge of methods to solve partial differential equations and learn the Fourier analysis of periodic functions and their applications in physical problems such as vibrating strings etc. 3. Learn about the special functions, such as Legendre polynomial, Bessel functions and Hermite polynomials and their applications in various physical problems. 4. Learn Integral transforms- Fourier and Laplace transform and study their application in solving boundary value problems and differential equations.
	Phy/V/ CC/10	Electronics–I	At the end of the course the student is expected to assimilate 1. Basic knowledge of N- and P-type semiconductors, mobility, drift velocity, fabrication of P-N junctions; forward and reverse biased junctions, application of PN junction for different type of rectifiers and voltage regulators. 2. NPN and PNP transistors and basic configurations also about current and voltage gain, Biasing and equivalent circuits, coupled amplifiers and feedback in amplifiers and oscillators. 3. Operational amplifiers and knowledge about different configurations namely inverting and non-inverting and applications of operational amplifiers.
	Phy/V/ CC/11	Classical Mechanics and Nuclear Physics-II	1. Understand the phenomena of collisions and idea about center of mass and laboratory frames and their correlation. Apply Kepler's law to describe the motion of planets and satellite in circular orbit. 2. Learn the Lagrangian and the Hamiltonian formulations of classical mechanics and their applications in appropriate physical problems. 3. Learn the ground state properties of a nucleus – relation between the mass number and the radius, average density, range of force, saturation property, concepts of packing fraction and binding energy, explanation of fusion and fission from the nature of the binding energy graph. 4. Know about the nuclear models – (i) liquid drop model, semi-empirical mass formula, (ii) shell model, evidence of shell structure, magic numbers, predictions of ground state spin and parity, consistency of the shell structure with Pauli exclusion principles.
	Phy/V/ CC/12	Laboratory-V	In the laboratory course, the students will determine the value of g by Kater's pendulum, the modulus of rigidity of a cylindrical body by statical method. Use CRO for the study of A.C. supply waveform and compare the frequencies and study CE amplifier and hence obtain band-width. The students will also study beta-decay in a GM counter and carry out the statistical analysis.

Semester	Course	Name of the paper	Course Output
V	Phy/V/ CC/13	Laboratory-VI	In this laboratory course, students will learn about heat conduction and thermal properties of metallic and non-metallic solids. Experiments will be carried out to (i) Determine the thermal conductivity of a bad conductor by Lee's method. (ii) Determine the Stefan's constant (iii) Determine mechanical equivalent of heat by Joule's electrical calorimeter. (iv) Determine the thermal conductivity of a metallic rod by Searle's method (v) Verify Stefan's law.
	Phy/V/ CC/14a	Atomic and Molecular Spectroscopy	1. Understand the structure of atom- Bohr model, Sommerfield model and relativistic effects. 2. Understand the concepts of space quantization and spinning electron hypothesis, quantum numbers associated with vector atom model, coupling schemes. 3. Study of influence of electric and magnetic fields on atoms – Zeeman, Paschen-beck and Stark effect. 4. Understand the concepts of diatomic molecules as rigid rotator, Vibrating diatomic molecule as a harmonic oscillator, vibrational and rotational structures. Fortrat diagram, Raman effect, Raman spectra and its explanation.
	Phy/V/ CC/14p	Laboratory-VII	In this laboratory course, the students will have a real life experience of various optical phenomenas like Interference and diffractions both from normal light source and laser. Experiments will be carried out to (i) Determine the radius of curvature of a convex lens by Newton's rings method, (ii) Determine the wavelength of monochromatic light by Michelson's interferometer, (iii) Measure the width of a single slit from the study of its Fraunhoffer diffraction, (iv) Determine the wavelength of sodium D-lines by using Fresnel biprism, (v) Determination of wavelength of laser light using diffraction grating, (vi) Determination of the diameter of a thin wire using laser.
	Phy/V/ CC/15	Laboratory-VIII	In this laboratory course, students will understand the use of C++ programming in solving numerical problems. They will acquire the basic know-how to write small programs solve problems and obtain results. They will use C++ program to- (i) solve a Quadratic Equation, (ii) calculate matrix addition and matrix multiplication, (iii) differentiate and integrate a function, (iv) solve an algebraic equation by Newton-Raphson method and Bisection method.

Sem	Course	Name of the paper	Course Output
VI	Phy/VI/ CC/16	Quantum Mechanics	This course will enable the student to get familiar with quantum mechanics formulation. 1. Know main aspects of the inadequacies of classical mechanics and understand historical development of quantum mechanics and ability to discuss and interpret experiments that reveal the dual nature of matter. 2. Understand the theory of quantum measurements, wave packets and uncertainty principle, Understand the central concepts of quantum mechanics: wave functions, momentum and energy operator, the Schrodinger equation, time dependent and time independent cases, probability density and the normalization techniques, skill development on problem solving e.g. one dimensional rigid box, tunneling through potential barrier, step potential, rectangular barrier. 3. Use quantum mechanics to study non-relativistic hydrogen atom, for its spectrum and eigen-functions.
	Phy/VI/ CC/17	Electromag netic Theory	1. After going through this course, students will have an understanding of the Maxwell's equations, role of displacement current, gauge transformations, scalar and vector potentials, Coulomb and Lorentz gauge, boundary conditions at the interface between different media. 2. Apply Maxwell's equations to deduce wave equation, electromagnetic field energy, momentum and angular momentum density. 3. Analyse the phenomena of wave propagation in the unbounded, bounded, vacuum, dielectric, guided and unguided media. Understand the laws of reflection and refraction and to calculate the reflection and transmission coefficients at plane interface in bounded media.
	Phy/VI/ CC/18	Thermal and Statistical	This course will enable students to 1. Learn the basic aspects of kinetic theory of gases, Maxwell-Boltzman distribution law, equitation of energies, mean free path of molecular collisions, viscosity, thermal conductivity, diffusion and Brownian motion. 2. Comprehend the basic concepts of thermodynamics, the concept of entropy and the associated theorems, the thermodynamic potentials and their physical interpretations. Learn about Maxwell's thermodynamic relations. 3. Understand the concepts of microstate, macrostate, ensemble, phase space, thermodynamic probability and partition function; Understand the distinguishably or indistinguishably nature and conditions which lead to the three different distribution laws e.g. Maxwell-Boltzmann distribution, Bose-Einstein distribution and Fermi-Dirac distribution laws of particles and their derivation. 4. Understand the concept of Fermi energy and Fermi level, calculate the macroscopic properties degenerate Fermi

		Physics	gas and electronic contribution to specific heat of metals

Sem	Course	Name of the paper	Course Output
VI	Phy/VI/ CC/19	Laboratory-9	In this laboratory course, students will perform experiments to (i) Determine the value of e/m of electron (ii) Determine the number of lines per unit length of the grating by using a spectrometer (iii) Determine the refractive index of the material of a prism at different wavelengths by using a spectrometer (iv) Determine the figure of merit of a galvanometer (v) Calibration of an ammeter and a voltmeter by using a potentiometer (vi) Determine the melting point of a wax using a Thermocouple.
	Phy/VI/ CC/20	Laboratory-10	In this course, experiments are demonstrated to (i) Determine the electrolytic conductivity of a substance by Kohlrausch's method (ii) study the Frequency Response and Voltage Gain of a RC-Coupled Amplifier (iii) study the Hall effect and determine the Hall coefficient and Hall voltage (iv) Measure the capacitance by de Sauty's method (v) Determine the self inductance of a coil by Raleigh's method using a Wheatstone bridge (vi) Determine the work function and Plank's constant by using a photocell (vii) study the series and parallel resonance circuits with A.C. source and draw the current frequency curve and calculate Q.
	Phy/VI/ CC/21a	Solid State Physics – II	At the end of the course the student is expected to gain 1. Knowledge of lattice vibrations, phonons and in depth of knowledge of Einstein and Debye theory of specific heat of solids. 2. Knowledge of different types of magnetism, hysteresis loops and energy loss. 3. Understanding about the dielectric and ferroelectric properties of materials. 4. Understanding about the band theory of solids and basic idea about superconductors and their classifications.
	Phy/VI/ CC/21p	Laboratory-	In this laboratory course students will perform experiments to (i) study and verify fundamental logic gates AND, OR, NOT and XOR gates using NAND gates (ii) Study of OP-AMP characteristics (iii) OP-AMP as a) Adder and Subtractor b) Differentiator and Integrator (iv) Study of Half Adder, Full Adder and 4 bit Binary Adder (v) Study of Half Subtractor, Full Subtractor, Adder, Subtractor using Full Adder (vi) Study of a simple power circuit with a pi-section filter.

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	Phy/VI/ CC/22	Laboratory-12	In this laboratory course, students will gain knowledge about the use of FORTRAN in solving numerical problems in Physics. The students will learn about the basics of FORTRAN programming and perform the following experiments to implement their understandings. (i) FORTRAN program to solve a Quadratic Equation, (ii) to find roots of f(x)=0 by using bisection method and Newton-Raphson method. (iii) to find the sum of (a) Cosine series (b) Sine series (iv) to perform (a) Matrix Addition and (b) Matrix Multiplication (v) to integrate a given function by Simpson's 1/3 rule (vi) to differentiate a given function.

Department of Statistics (Under Graduate)

Programme Outcome –

- The programme will make the students to recognize the importance and value of statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines and be familiar with a variety of examples where statistics helps accurately explain abstract or physical phenomena. Programme further recognizes and appreciates the connections between theory and applications. Students develop analytical thinking and good communication skills during classroom teaching (through projects/presentation/practical) and also as they participate in various activities both at departmental as well as college level.

Programme Specific Outcome –

- The thrust of the program is to provide a platform for pursuing higher studies leading to post-graduate or doctoral degrees. Along with this students are equipped with skill enhancement courses like Operations research, Statistical packages and R language.It further enhances theoretical rigor with technical skills which prepare students to become globally competitive to enter into a promising professional life even after graduation.
- It trains students to work effectively in a broad range of analytic, scientific, government, financial, health, technical and other positions.This program offers a range of traditional avenues in academics, Govt. Services, IAS, Indian Statistical/ Economic Services, Industries, Investment, Banking, Banks and Insurance Sectors, CSO and NSSO, Investigator in Govt. organizations, Statistical and Economic Bureau & various PSUs, Market Research, Actuarial Sciences, Biostatistics, Demography etc. It also provides an array of non-traditional employment avenues ranging from Stock Broker Analyst, Sports Analyst, Poll Analyst, Business Analyst, Financial Analyst, and Content Analyst etc.

Course Outcomes		
Course code	**Name of Course**	**Outcomes**
STA/1/EC/01	**Descriptive Statistics**	• It enables students to understand the general concepts related to statistical data, tabular and graphical presentation, measure of central tendency, measure of dispersion, moments, correlation and regression analysis and measure of association in two way classified data. • It helps students to have adequate knowledge of basic applied statistics.
STA/2/EC/02	**Probability and Probability Distributions**	• It helps the students to understand various concepts associated with theoretical and applied probability, random variables both discrete and continuous, p.m.f and p.d.f for univariate and bivariate random variables, mathematical expectations, generating functions, standard probability distributions for discrete and continuous random variable.
STA/3/EC/03	**Survey Sampling and Indian Official Statistics**	• It enables students to understand the basic concepts of sampling theory and official statistical system in India.
STA/4/EC/04	**Statistical Inference I**	• By studying this paper, the students enable to understand definition and concepts of random sample, statistic, parameter, and sampling distribution, criteria of good estimators and related theorems along with its applications, methods of estimation, bivariate normal distribution and interval estimation.
STA/5/CC/05	**Statistical Inference II**	• This paper helps the students to understand the concepts of testing of hypothesis, critical region and related theorems and applications, decision problems, sequential analysis and non-parametric tests.
STA/5/CC/06	**Sampling Distribution**	• It helps the students to understand some concepts of random sample, parameter, statistic, sampling distribution, standard error, Central Limit Theorem and its application, chi-square, t and F distributions and order statistics.
STA/5/CC/07	**Linear Model and Design of Experiment II**	• This paper helps the students to understand various basic experimental designs and their principles with outlay, model and statistical analysis, factorial experiments, Gauss Markov setup, analysis of variance (one way and two ways) and regression analysis.
STA/5/CC/08-A	**Biostatistics**	• It helps the students to explore the basic concepts and background of biostatistics, types of scales of measurements, measurements of morbidity and mortality, censored data and types of censoring, survival and hazard functions, logistic regression and reliability analysis.
STA/5/CC/08-B	**Numerical Methods**	• After the completion of this paper the student understands the conceptsof finite differences and use of various operators, interpolation and extrapolation, numerical integrations and differentiations, its solutions and related problems.
STA/6/CC/09	**Operations Research**	• It enables the students to understand the definition of operation research, different types of models, the basics of linear programming, transportation problems, game theory and applications of OR methods to real life problems.

STA/6/CC/10	**Applied Statistics**	• This paper helps the students to understand various sources of demographic data, fertility, mortality, related demographic techniques, index number and statistical process control.
STA/6/CC/11	**PROJECT**	• The student can have a real hand experience of handling statistical data; apply the various statistical tools and techniques.
STA/6/CC/12-B	**Stochastic Processes and Queuing Theory**	• This module will equip students with concepts of stochastic and stationary processes, Markov chains, Poisson processes like birth and death processes, Queuing systems, Gambler's Ruin Problems and Branching processes.
STA/6/CC/12-B	**Statistical Computing with R**	• This paper will help students to understand usage of R software with focus on Introduction and preliminary concepts to R, Types of data input in R, Defining logical and mathematical operators in R, Plotting of graphs and usage of some basic statistical methods using R.
STA/6/CC/12-C	**Time Series Analysis and Forecasting**	• This paper enable students to understand Time series data and its applications, components of time series, modelling and curve fitting, measurement of trend, estimation of seasonal and cyclic component of time series, Forecasting and stationary time series.

DEPARTMENT OF ZOOLOGY	
Programme Outcome	Students will acquire comprehensive knowledge on the nature and workings of various forms of life. Life, they will appreciate, is a network of molecular interactions between nucleic acids, proteins, amino acids, carbohydrates, and lipids, and students will embrace the overall biological principle that these interactions are the basis of diversity, intelligence, health, behaviour, and even long-term survival of species.
	Students will learn firsthand knowledge on biological experiments, use of scientific equipment, generation of data, and interpretation of the findings. They will be familiarised with simple dissection and microscopy to complex cellular isolation and molecular techniques.
	Students will develop a keen sense of scientific methods such as hypothesis, theory, experiments, empirical data and learn to employ them for personal development, day-to-day experience and understanding of nature.

	Students will be aware of critical issues in health and diseases that affect regional, national, and global environment and make use of that information to covey public awareness at different levels, through popular writings, campaigns and field visits.
Programme Specific Outcome	The course is devised to impart most important trends in our scientific understanding of life. On completion, the students will get an all-inclusive grasp of the fundamentals of life system in animals, plants and microbes.
	Division of life into domains will be crucial for understanding the differences but relatedness of life forms as varied as viruses, bacteria, fungi, protists, plants and animals. The biological features and significance of their interactions with other organisms will be understood through the course.
	One major feature is cellular interactions leading to diseases and other health conditions. Students will know how pathogens invade cells, cells themselves undergo genetic errors such as cancer, and molecular anomaly cause immune diseases.
	The course also aims to acquaint the students with landmark and latest developments in biological techniques such as DNA sequencing, protein sequencing, cellular and molecular imaging, gene editing (CRISPR), electron microscopy, *in vitro* cell propagation, cell cloning, and various chromatography techniques.
B.SC. ZOOLOGY - COURSE OUTCOMES	
Course	**Outcomes**
Biosystematics and Non-chordate Biology	Knowledge of the principles and systems of animal nomenclature, how animals are organised into different groups (taxons), the structure and functions of small animals (invertebrates).
Chordate Biology and Anatomy	Understanding taxonomy and classification of higher animals (chordates) such fishes, amphibians, reptiles, birds and mammals. Comparative anatomy of chordates based on specific animals.
Evolution and Ethology	Knowledge of the fundamental basis of diversity of life forms, how Darwin changed our perspective on origin of life, the process of biological changes and formation new species with unique characteristics.

Endocrinology and Reproduction Biology	Understanding the working of animal physiology, how our intricate body parts produce chemical compounds that act as a control device of our different cellular and outward behaviours.
Cell Biology	Knowledge of the finest component of life, cellular components, chemical compositions, how complexity of cellular interaction gives rise to complexity in body plan and functions, and how cells work.
Physiology	Knowledge of the body organs and their functions, their differences in structure, location in different parts of the body, and how they control our brain, digestion, excretion, and movement.
Biochemistry	Understanding the complex array of chemical reactions in our body, how foods are digested to form energy, how they produce vital molecules for cellular function, and how they control our health and normal behaviour.

Department of Management Learning Outcomes	
Programme Outcome	Students will develop as effective management professionals and take on more responsibilities in future and to give outstanding results in the area of their interest and their service areas.
Programme Specific Outcome	The ability to understand, analyze and apply management concepts in the areas related to marketing, human resources and finance for efficient running of the business organization of varying complexity in competitive era.

Course Outcomes

Course Title	**Outcomes**
Fundamentals of Management and Organizational Behavior	On successful completion of this course, the students should have understood Principles & functions of Management, Process of decision making, modern trends in management process. To inculcate knowledge on Personality, Perception, Motivation, Job satisfaction, morale, Group dynamics, Leadership traits, Counseling and guidance, etc.
Statistics for Business Decision	The students will be able to interpret statistical calculations and utilize it for various fields such as Market Research, Quality Control, Product Planning, Forecasting, Yearly Reports and Personnel Management etc.
Entrepreneurship Development	To make the students sell their ideas, find problems and solutions, identify needs and wants of consumers so as to develop innovative business plans, enable them to mobilize people and resources, create value and cultivate endurance.
Principles of Economics	The students acquire the knowledge of Demand forecasting in sales management, Price fixing, market competitors, and management business economically.
Business accounting	On successful completion of this course the student are enabled with the. Knowledge in the practical applications of accounting. Students will recognize commonly used financial statements and how financial information is transacted across business.
Ethics and Corporate Social responsibility	To make the students well aware of business ethics including the moral principles and standards that guides the behavior of world- wide business. The students will also be acquainted with the social responsibilities of corporate businesses creating values and competencies of organizations.
Principles of Marketing	To determine the core concepts and the role of marketing in business and society. To gain the ability of developing marketing strategies based on product, price, place and promotion objectives. To identify the unique marketing mixes and selling propositions for specific product offerings.

Foundations of Human Resource Management	On Successful Completion of this subject, the students should have understood the functions of Human Resource /Personnel Department, Manpower planning, performance appraisal, Salary administration, Labour Welfare, Industrial Relations etc.
Cost and Management accounting	To inculcate knowledge on Cost sheet, Material issues, Labour cost, Financial statement analysis, Budgeting etc. Students will also be equipped with basic analytical skill of business financials using tools like ratio analysis, fund and cash flow statement analysis.
Computer Fundamentals and application	To inculcate knowledge on Computer based information system MIS support for the functions of management.
Basics of Financial Management	To inculcate knowledge on the basic accounting concepts, Double entry book keeping system and various books of accounts Preparation of final accounts, etc.
Business research	Enable the student to understand the Research methods and sampling techniques, Analysis and interpretation of data, Application of research
Introductory Operations Research	To inculcate knowledge on maximize the profit and minimize the cost in every place.
Advertising	On successful completion of this course, the students should have understood Advertising, Ad media, Ad agencies, Sales force management, promotional strategies

Working Capital management	Making students aware of the complexity of business and evaluate working capital impact on firms profitability, liquidity, risk and operating flexibility
Strategic Management	To expose the students to various perspectives and concepts and enable them to understand the principles of strategy formulation, implementation and control and apply these tools to solve business problems.
Investment Management	This course will enable the students to explore the theory and practice of investments in areas of capital market structure, stock valuation, security analysis and portfolio management.
Consumer Behviour	On successful completion of this course, the students should have understood consumer motivation and perception, Learnt consumer behaviour and attitude towards consumer decision making.
Marketing of Services	On successful completion of this course, the students should have an understanding of the growing importance of services in every organization.