PG COURSE OUTCOMES (COURSE LEVEL)

COURSE CODE	COURSE TITLE	CO
M.A. ENGLISH		
PCENA20	CHAUCER AND ELIZABETHAN LITERATURE	1. Recall the historical, social and biographical Influence 2. Discuss the literary significance of the Era 3. Interpret literary texts 4. Analyse the evolution of English Language in Literature 5. Assimilate writing and analytical Skills
PCENB20	RESTORATION AND EIGHTEENTH CENTURY LITERATURE	1. Explain the characteristics of the Eighteenth century and Restoration Literature 2. Identify and analyze the writer's perspective, expression and their reflection of life representing the Restoration age 3. Critically interpret the variety of literary genres, new trends, themes and style in Literature of this age 4. Analyze the ways in which the authors from the Restoration constructed the literary values and to trace their influence upon the age 5. Evaluate the traditional, religious, political, and aesthetic authority of this age
PCENC20	CLASSICAL LITERATURE OF THE WORLD	1. Explain the greatness of literary works and their influence on world literature 2. Interpret the best that was known and thought in the world 3. Apply the knowledge gained through plots, characters, themes etc. to real life situations 4. Analyse literary works to understand the world and interpret everyday situations 5. Evaluate human life and experience in texts and in reality
PCEND20	INDIAN LITERATURE IN ENGLISH	1. Recognize the characteristics of major movements and figures of Indian Literature in English through the study of selected literary texts 2. Explain different literary genres; poetry, fiction and non-fiction 3. Interpret different styles of writing: expository, narrative and descriptive 4. Analyse literary concepts and underlying aesthetics 5. Evaluate original writing in English by Indian authors and translated texts from regional languages
PEENA20	ESSENTIAL ENGLISH GRAMMAR	1. Discuss grammatical structures common to British English 2. Interpret how the various systems of English grammar function in relation to one another 3. Apply both traditional and contemporary methods in

		written and oral presentations
		4. Practice all covered material through classroom activities and presentations and achieve linguistic competence in using language effectively, efficiently and appropriately
		5. Edit written and spoken performance and present original research and analysis in standard written academic language
PEENB20	**MODERN ENGLISH GRAMMAR**	1. Establish the feasibility of following the rules and concepts that aid in usage
		2. Identify grammar learning strategies to aid in comprehensibility
		3. Explore learning strategies that integrate language and grammatical construction for standard language acquisition
		4. Justify the application of grammar for best outcomes in language learning
		5. Create activities that have a great impact to develop grammatical usage to suit student's ability
PIENA20	**INDEPENDENT ELECTIVE I A: LITERARY SKILLS FOR EMPLOYABILITY–I**	1. Remember and recall names of authors, literary works, dates, facts, terms and concepts
		2. Demonstrate knowledge of English Language and Linguistics
		3. Apply knowledge of literary criticism to anlayse literary works
		4. Demonstrate knowledge in Application-oriented areas like Research Methodology, Translation and English Language Teaching
		5. Develop effective strategies to prepare for competitive examinations
PIENB20	**INDEPENDENT ELECTIVE I B: TECHNICAL AND BUSINESS WRITING**	1. Recognize, analyze, and accommodate diverse audiences and produce documents appropriate to audience, purpose, and genreand edit for appropriate style, including attention to word choice, sentence structure,punctuation, and spelling
		2. Acquire communication Skills – to include effective development, interpretation, and expression of ideas through written, oral, and visual communication
		3. Develop critical Thinking Skills – to include creative thinking, innovation, inquiry and analysis, evaluation and syntheses of information
		4. Analyze the ethical responsibilities involved in technical communication
		5. Analyze an audience, both domestic and international, and write effective technical and business documents for that audience and locate, evaluate, and incorporate pertinent information
PCENE18	**AMERICAN LITERATURE**	1. Interpret American life and Culture against the background of History and Literary development
		2. Discuss American Literary artists, who were innovative in their outlook and literary temper.
		3. Identify key ideas, representative authors and works,

		significant historical or cultural events, and characteristic perspectives or attitudes expressed in the literature of different periods or regions
		4. Analyze literary works as expressions of individual or communal values within the social, political, cultural, or religious contexts of different literary periods
		5. Write research-based critical papers about the assigned readings in clear and grammatically correct prose, using various critical approaches to literature
PCENF20	**LITERARY CRITICISM**	1. Discuss the characteristics of the works of seminal literary critics
		2. Explain critical concepts and literary genres through literary criticism
		3. Apply Critical concepts to literary texts
		4. Analyse literary texts and critical works
		5. Evaluate literary texts based on critical ideas acquired from seminal works
PCENH18	**WOMEN'SWRITING**	1. Discuss aspects of women's writing
		2. Explain diversity of women's experiences and their varied cultural moorings
		3. Interpret different forms of literature: poetry, fiction, short fiction and critical writings
		4. Analyse women's literary history and feminist criticism
		5. Evaluate literary works by women
PEENC20	**POSTCOLONIAL LITERATURE**	1. Trace the aspects of subjectivity, race, class and feminism in the Postcolonial space
		2. Understand how literature shapes ideas about society and social identities in interaction with other discourses such as history and politics
		3. Analyse the history of Colonial rule, liberation movements in various nations and develop a critical thinking on the movement of Post colonialism
		4. Possess a coherent knowledge and a critical understanding of Postcolonial literature and its historical, cultural and theoretical developments.
		5. Reinterpret and examine the values of literary texts, by focusing on the contexts in which they were produced, and reveal the colonial ideologies that are concealed within.
PEEND18	**LITERATURE OF THE MARGINALIZED**	1. Discuss the concept of 'marginalized' and 'subaltern' from the socio-cultural and literary context
		2. Identify and analyze the themes of place, gender, class, caste, class and nationality in literature from subaltern perspective
		3. Apply subaltern theories and critically interpret the nuances of subaltern elements in literature
		4. Analyze the voice of marginalized recorded in literature from the global and local context with comparative and analytical methodology
		5. Create an oral and written form of interpretation on

		subaltern literature
PEENE20	**INDEPENDENTELECTIVE II A: LITERARY SKILLS FOR EMPLOYABILITY– II**	1. Remember and recall names of authors, literary works, dates, facts, terms and concepts 2. Demonstrate knowledge of English Language and Linguistics 3. Apply knowledge of literary criticism to analyze literary works 4. Discover interest and demonstrate knowledge in literature in English outside Britain and America 5. Demonstrate knowledge in Application-oriented areas like Research Methodology, Translation and English Language Teaching
PIEND19	**INDEPENDENT ELECTIVE II B: CREATIVE WRITING**	1. Understand how to describe critical ideas 2. Apply critical and theoretical approaches to the reading texts 3. Examine the relationship between the individual works and conventional literary work 4. Evaluate how ideas, themes and values create an impact on societies 5. Create poems or literary non-fictional pieces those are original and engaging
PCENI20	**ROMANTIC AND VICTORIAN LITERATURE**	1. Explain the nature of Industrial Revolution, the subsequent scientific and material progress and to explore a society that was being re-organized around Science, Factories and Business. 2. Connect the works of the Romantics and Victorians to their social and historical backgrounds and evaluate it 3. Analyse and appreciate the interconnectedness of human life and nature as reflected in works written during the Romantic period. 4. Differentiate the traits of Romanticism and Victorianism in English literature with emphasis on concepts of self, imagination, and the unconscious. 5. Evaluate the impact of Romanticism and Victorianism on the development of English literature, with emphasis on development of literary forms and literary modes of expression.
PCENJ20	**SHAKESPEARE STUDIES**	1. Discuss Elizabethan and Jacobean context in connection with the ideas of culture, history and politics of these periods 2. Understand and explore the language, key terms, concepts, dramatic genres and themes of Shakespearean theater thus gaining an insight into the age of Shakespeare. 3. Analyze verbally and in writing Shakespeare as a product of his society 4. Read analytically to determine Shakespeare's purpose, historical and cultural perspective, and use of rhetorical and dramatic strategies in creating a play.

		5. Evaluate Shakespeare's contribution to the English language and to the development of the modern drama and recognize various theories of literary criticism applied to Shakespeare's plays
PCENK20	**CONTEMPORARY CRITICAL THEORY**	1. Discuss the role of historical context in the interpretation of literary texts 2. Examine various critical theories for their success, drawbacks and influence 3. Analyse critical ideas for an accurate understanding of literary works 4. Compare and Contrast various critical theories and the practice 5. Evaluate literary works using appropriate critical ides/concepts/theories
PCENL20	**RESEARCH METHODOLOGY**	1. Identify and contextualize research problems 2. Identify the tools specific to the research problem 3. Collect and catalogue data and gather the inference 4. Develop research questions for qualitative and quantitative research 5. Formulate a hypothesis, write a research proposal and Plan out the research
PEENF20	**ELECTIVE III A: TRANSLATION STUDIES**	1. Identify the technical terms in translation theory 2. Explain the theoretical principles in translation theory and their implications 3. Prepare a glossary of words from the SL text 4. Apply the knowledge of translation theories to research in translation 5. Appraise the problems of equivalence and loss and gain between the SL and TL texts, leading to comparative evaluation of available versions of translations of a text 6. Translate literary and non-literary works
PEENG20	**ELECTIVE III B: LITERATURE FOR ACADEMIC AND PROFESSIONAL PURPOSES**	1. Recognize the various literary genres and Literature written from various socio-political, cultural and historical backgrounds 2. Examine the transition and transformation of text, context, and theory in the literary scenario from period to period 3. Develop subject- specific academic writing skill, critical thinking and writing Skills 4. Demonstrate the mastery of answering the question in a competitive examination in English Literature 5. Acquaint with secondary sources in Literature and to demonstrate strategies for research
PIENE20	**INDEPENDENTELE CTIVE III A: LITERARY SKILLS FOR EMPLOYABILITY-III**	1. Remember and recall names of authors, literary works, dates, facts, terms and concepts 2. Demonstrate knowledge of English Language and Linguistics 3. Apply knowledge of literary criticism to anlayse literary works 4. Discover interest and demonstrate knowledge in literature

		in English outside Britain and America 5. Demonstrate knowledge in Application-oriented areas like Research Methodology, Translation and English Language Teaching
PIENF20	ELECTIVE III B: CONTENT WRITING	1. Cultivate technical writing Skills 2. Develop editing skills 3. Create using analytic skills 4. Display skills in publication and advertising 5. Engage in Freelance writing and entrepreneurship
PCENM20	LITERATURE OF THE MODERN AGE	1. Recognize the broad spectrum of literary and artistic movements of the Twentieth century and thereby develop critical insight to comprehend the plots, characters and techniques in the literary works. 2. Explain the relationship between literature and social structures. 3. Discuss major issues related to the cultural and social context of the 20th century. 4. Appreciate the masterpieces of literature of this literary period and to analyze formal and thematic aspects of modern age in the background of larger cultural and historical movements. 5. Realize the degeneration of morality and human values in the modern age.
PCENN20	CONTEMPORARY WRITING	1. Discuss the significance of Contemporary literary works 2. Appreciate contemporary writing for the form and theme 3. Evaluate Contemporary writers for their contribution to literature and society 4. Evaluate the contemporary literary schools /movements 5. Create critical essays on contemporary writing
PCENO20	ENGLISH LANGUAGE TEACHING	1. Identify approaches to enable language learning and establish the feasibility of following a bilingual approach for the teaching of English. 2. Create a resource bank of language teaching strategies, ideas and techniques to be used for English Language teaching. 3. Analyse the concepts that relate and integrate content and language instruction for language acquisition. 4. Evaluate the characteristics of the approaches to enhance performance for best outcomes in language learning. 5. Design activities that allow learners to practice academic language and to develop second language acquisition at the best of the student's ability.
	RESEARCH PROJECT	1. Demonstrate knowledge of research methods, theories and research context in Literature and Language teaching 2. Explain a research problem/question foregrounded against the relevant literary context and/or research context 3. Apply relevant and result-yielding research methods, approaches and theories to the conduct of qualitative and quantitative research

		4. Organise and evaluate the relevant sources of scientific evidence to construct a well-supported, research statement and/or logical argument 5. Devise a framework of expository writing to present the trajectory, context and outcome of the research
PEENH20	**Elective IVA:** **HISTORY OF IDEAS**	1. Identify the evolution of human thought and history of ideology 2. Explain the germ and growth of different schools of philosophy, their episteme and ontological development 3. Interpret social behaviour and cultural practices of human beings according to each train of thought focused on the course 4. Evaluate the ethical attributes of the schools of philosophy 5. Critique the attributes of other disciplines against the evolutionary changes in human thought
PEENI20	**ELECTIVE IV B:** **CULTURAL** **THEORY AND** **POPULAR** **CULTURE**	1. Recognize the role of Culture in human thought, expression and art 2. Remember the names of the thinkers who initiated the cultural turn in analyzing all the productions of the human mind and both individually and collectively, and their contribution to cultural studies 3. Analyse literary and other related art forms in cultural perspective 4. Apply Cultural Theory as a research methodology 5. Evaluate literary text for their cultural value
PIENG20	**INDEPENDENT** **ELECTIVE IV A:** **LITERARY SKILLS** **FOR** **EMPLOYABILITY –** **IV**	1. Remember and recall names of authors, literary works, dates, facts, terms and concepts 2. Demonstrate knowledge of English Language and Linguistics 3. Apply knowledge of literary criticism to anlayse literary works 4. Discover interest and demonstrate knowledge in literature in English outside Britain and America 5. Demonstrate knowledge in Application-oriented areas like Research Methodology, Translation and English Language Teaching
PIENH20	**INDEPENDENT** **ELECTIVE–IV B:** **LITERATURE AND** **ENVIRONMENT**	1. Explore various eco-critical perspectives through nature studies 2. Engage with environmental issues through literary narratives 3. Understand about the ecological degradation and various natural calamities that affect the planet earth due to the reckless nature of human beings 4. Develop critical awareness about sustainability practices 5. Identify environmental issues via historical narratives
M.S.W		
PCSWA20	**INTRODUCTION TO** **SOCIAL WORK** **AND SOCIOLOGY**	1. Able to Understand Social Work as a Profession. 2. Understand various ideologies of social work. 3. Become aware of the emergence, growth and development

		of Social Work as a Profession
		4. Consciously use Social Work knowledge and demonstrate professionalism as a trainee
		5. Gain wider knowledge on diverse approaches and be able to appropriately use theories and approaches in her field work placements and Practice Social Work in an International context.
PCSWB20	SOCIAL CASE WORK	1. Analyse and practice the basic philosophy, principles and values of social work as a method of social work.
		2. Effectively understand the scope of social work.
		3. Study and support the application of theories and models in addressing the problems of individuals.
		4. Appreciate and practice the basic philosophy, principles and values of social work as a method of social work.
		5. Acquire skills in recording, reflecting and evaluating on the work to grow professionally.
PCSWC20	SOCIAL GROUP WORK	1. Develop the students on the activities of group work process, types of group, characteristics of group, group dynamics and plan interventions based on appropriate Group Work models
		2. Understand the significance of Social Group Work
		3. Acquire knowledge, skills and values in practicing Social Work with Groups through Programme Planning
		4. Examine the role of group worker in different settings
		5. Acquire skills in recording and evaluation
PESWA20	ELECTIVE I A: SOCIAL PROBLEMS	1. Bring changes in the social structure without violence and coercion.
		2. Modify the malfunctioning of the social and economic institutions.
		3. Analyze social problems and highlight the significance of social work intervention in the Indian context.
		4. Understand and keep in pace with the disasters and find ways to handle or manage disasters.
		5. Critically analyze the impact of social problems on the society.
PISWA20	IEC- DISASTER MANAGEMENT	1. Understanding of the process of Disaster Management and the various types of disasters.
		2. Enhance the students to acquire knowledge on response to disasters and disaster cycle
		3. Practice the role of the Social Worker in Disaster Management and legislation related to it
		4. Equip themselves to work in disaster situations and Expose knowledge on the impact of disaster on individual and community
		5. Develop skills to analyze the factors leading to disaster
PCSWD18	CONCURRENT FIELD WORK	1. Acquire knowledge, attitude and values for professional practice.
		2. Develop skills to analyse socio –economic-cultural-rural realities and their impact on individuals, families, groups

		and communities
		3. Initiated and use to acquiring skills in systematic observation, critical analysis, develop a spirit of inquiry and document learning through preparation of family and community profile/reports
		4. Understand the role of a Social Worker in an agency and in the community
		5. Enhance their ability to plan, organize programmes and contribute as a team member
PCSWE20	**HUMAN GROWTH AND PERSONALITY DEVELOPMENT**	1. Summarise the relevance of psychology for social work practice
		2. Understand the psychological bases and processes involved with cognition, learning, behaviour and personality development
		3. Obtain an insight to factors contributing to development of personality
		4. Explore the concept of Social psychology and application of psychological tests.
		5. Explore the developmental stages of life from a psychological perspective.
PCSWF20	**SOCIAL WORK RESEARCH**	1. Demonstrate, develop and understanding the capability to independently conceptualize a problem and execute research
		2. Provide clear plan of the research and understand framework of research methods and techniques through research design
		3. Analyzing the concept of Data Collection and Data Processing
		4. Demonstrate, understanding and mastery of the knowledge, values, skills relevant to research competencies.
		5. Appropriately apply statistical techniques in Social Work Research
PCSWG20	**COMMUNITY ORGANISATION AND SOCIAL ACTION**	1. Able to demonstrate familiarity with community organization and social action as methods of social work Profession
		2. Able to develop skills of collecting and collating information to understand community its structure and Components.
		3. Able to gain the experience and exposure to Practice community organization and social action at Micro and Macro levels
		4. Adapt strategies to solve social problems and bring changes in the social structure without violence and coercion.
		5. Modify the malfunctioning of the social and economic institutions
PESWC20	**ELECTIVE II A: SOCIAL POLICY**	1. Obtain knowledge and understand social welfare administration

	AND SOCIAL LEGISLATION	2. Understanding of the concepts of social policy and social welfare policy to emphasize the importance of them. 3. Promote knowledge in understanding the cause and effects of discrimination and oppression. 4. Able to prepare modules and strategies for advocacy to bring sustainable social change 5. Obtain knowledge of legislative structure, frame and Process of making legislation.
PISWB20	**WOMEN AND DEVELOPMENT**	1. Examine the concept of women empowerment and development 2. Analyzing the importance of Education for the development of Women 3. Identify and understand the different situations and make women a part in development process 4. Identify and develop the process of protection of women health and environment 5. Implement the planning skills on development of women and know about the national policies related to women's empowerment
PNHRA22	**HUMAN RIGHTS**	1. Obtain knowledge and understand about fundamental Human Rights 2. Understanding of the concepts of Indian constitution and to emphasize its importance 3. Promote knowledge in understanding the concept of Universal Declaration and International Covenants on Human Rights. 4. To strengthen the promotion and protection of human rights around the globe 5. Promote awareness on the Indian legal system, rule of law, human rights related policies, Acts and movements
PCSWH20	**CONCURRENT FIELD WORK II**	1. Understand and develop the professional skills in social work profession 2. Demonstrate ability to analyse the social situations of individuals, groups and communities 3. Understand the role of organisations and Practice the principles of Social Work 4. Identify and Execute the different methods of Social Work appropriately 5. Develop and use different skills in planning, identifying and mobilising resources to organise programmes and meet needs of different groups
PPSWA20	**SUMMER PLACEMENT**	
PCSWI20	**COMPUTER APPLICATIONS FOR SOCIAL WORK**	1. Understand, implement, evaluate the basic applications of artificial intelligence 2. Identify, select, and apply the different tools in SPSS 3. Understand and develop the basic work of the SPSS and assess the needed data 4. Formulating the various statistical analysis to test different

		hypothesis
		5. Analyze the significance of statistical application and data management system
PSCDA20	**RURAL COMMUNITY DEVELOPMENT**	1. Able to understand the Rural realities and issues prevailing in Rural Areas
		2. To understand the rural development and panchayat raj System
		3. Able to understand Problems and invent solutions for better rural development
		4. Provide Knowledge on the Government and Voluntary efforts towards Rural Community Development.
		5. Demonstrate deep understanding of Primary Health Care Principles.
PSCDB20	**DEVELOPMENT PLANNING**	1. Investigating and understand the concept of planning and development
		2. Understand and support the relevance of participation in planning and the tools for enhancing development
		3. Critically analyze the different levels of planning for Development and analyse the knowledge about various schemes available for development for the people
		4. Examine the concept of Cooperative Movement and Acts related to it
		5. Assess the elements of Partcipatory technology Development and Programme Evaluation
PSHRA20	**LABOUR LEGISLATIONS**	1. Attain knowledge on labour legislation and labour welfare.
		2. Understand the legal provisions relating to labour welfare in different industries.
		3. Acquire the skills of working with organized sectors.
		4. Examine the existing structures of industrial and labour judicial system in India
		5. Acquire attitudes that are apt in the practice of labor welfare and labour law.
PSHRB20	**HUMAN RESOURCES MANAGEMENT**	1. Acquire and build the appropriate knowledge base to Human resource management.
		2. Contribute to the development, implementation and evaluation of employee recruitment, selection and retention plans and processes.
		3. Gain knowledge on corporate culture related to social issues in the work place.
		4. Acquire the skills of comprehending a multi-stakeholder perspective in viewing workplace issues
		5. Develop implement and evaluate organizational development strategies aimed at promoting organizational effectiveness.
PSMSA20	**MEDICAL SOCIAL WORK**	1. Understand the various dimensions of health to help people with illness manage the psycho-social impact of the same on their lives
		2. Acquire skills to contribute in a multidisciplinary team to

		provide the psycho- social dimension of the medical condition affecting the patient and his/her family
		3. Enhance their ability to identify and arrange community supports and resources to facilitate discharge from hospital/transfer to alternate care
		4. Provide support to patient and family during grief, mourning and be able to counsel patients facing death
		5. Enhance their ability to identify and arrange community supports and resources to facilitate discharge from hospital/transfer to alternate care
PSMSB20	**INTRODUCTION TO PSYCHIATRY AND MENTAL HEALTH**	1. Understand the context of practice of Psychiatric Social Work
		2. Learn and understand the concept of mental disorders and their management
		3. Acquire skills to identify, understand and assess mental disorders
		4. Gain competencies in knowledge, skills and attitude in managing mental disorders through understanding and practice of Psychiatric Social Work approaches
		5. Appreciate the importance and role of psychiatry social worker in development
PESWE20	**ELECTIVE III A: PROJECT FORMULATION**	1. Understanding the basic concepts of Project Formulation and Planning
		2. Develop and support the basic concepts and nature of the project proposal Support to Strengthen the individual to work with research.
		3. Understand about the community, different strategies and problem analysis techniques.
		4. Acquire skills of planning and Evaluation to develop project
		5. Analyzing the elements and significance of Project Development
PISWC20	**IEC- COUNSELLING**	1. Understand the basics of counseling and Guidance
		2. Obtain knowledge on theories of Counseling.
		3. Able to develop application of various counseling techniques with special groups
		4. Understand linkages of Counseling and Guidance in Social Work
		5. Demonstrate knowledge and skills related to building, maintaining, and utilizing counseling relationship to address mental health issues and meet client goals.
PCSWJ20	**CONCURRENT FIELD WORK III**	1. Demonstrate ability to analyse the social situations of individuals, groups and communities
		2. Evaluate and Understand the role of organisations and Practice the values, principles and ethics in fields of Social Work
		3. Organise Work and Develop competency in identifying and applying the different methods of Social Work appropriately

		4. Identify and Develop an individual, group and community problems through the application of Social Work skills
		5. Demonstrate competency in planning, identifying and mobilising resources to organise programmes and meet needs of different target groups
PSCDC20	**URBAN COMMUNITY DEVELOPMENT**	1. In-depth knowledge of urbanization and its effects
		2. Obtain knowledge of the various methods, Programs, strategies and development effort towards Urban Community Development
		3. Identifying the community development challenges facing urban and regional communities
		4. .Analyze the roles of social justice and diversity in communities, cities and regions
		5. Demonstrate the ability to work in team settings and collaborate with community Groups
PSCDD20	**ENTREPRENEURSHIP DEVELOPMENT**	1. Analyze the basic concept of Entrepreneurship and develop entrepreneurial skills to craft innovative responses to social problems
		2. Apply social entrepreneurship to both profit and non-profit firms to create social value
		3. Recognize, evaluate the opportunities, explore innovative approaches, mobilize resources, manage risks, and build viable social enterprises
		4. Bridge the social, cultural and economic gap by providing opportunities and encourage women to be economically empowered
		5. Analyze and understand the scope of SmallScale Industries for employment opportunities
PSHRC20	**LABOUR WELFARE AND INDUSTRIAL RELATIONS**	1. Acquire a global as well as a local perspective on Industrial relations and trade unions.
		2. Sensitized to adopt suitable attitude to practice Industrial Relations.
		3. Acquire appropriate and professional skills required for Industrial relations
		4. Attain knowledge on various statutory and legal aspects.
		5. Acquire interpersonal relationship and negotiation skills
PSHRD20	**ORGANIZATIONAL BEHAVIOUR**	1. Analyse individual and group behavior and understand the implications of organizational behavior on the process of management.
		2. Identify different motivational theories and evaluate motivational strategies used in a variety of organisational settings.
		3. Evaluate the appropriateness of various leadership styles and conflict management strategies used in organizations.
		4. Explore managerial and interpersonal skills in presenting a new perspective for management.
		5. Explain how organizational change and culture affect working relationships within organization.
PSMSC20	**REHABILITATION**	1. Learn and understand professional rehabilitation strategies

	STRATEGIES AND TECHNIQUES	and techniques. 2. Understand the importance of social work profession in rehabilitation. 3. Examine the role of social workers in the field of rehabilitation. 4. Analse the legal status and the welfare schemes for the specially challenged. 5. Acquire professional skills to examine and assess clients with major disabilities.
PSMSD20	**PSYCHIATRIC SOCIAL WORK**	1. Explore the emerging trends in the care of Psychiatric social work. 2. Examine the application of counseling with various issues. 3. Examine the legal aspects in the Psychiatric settings. 4. Emphasize the provision of competent, ethical clinical competencies of social work. 5. Sensitized with attitudes and skills required for the practice of counseling.
PESWG20	**ELECTIVE IV A: ADMINISTRATION OF SERVICE ORGANIZATION**	1. Understand and support about the concepts of social welfare and social welfare administration 2. Learn and develop the knowledge on actual structure, process and components of welfare administration 3. Understand and evaluate the relevance of social welfare administration in the field of Social Work 4. Analyse ,Gain knowledge on office procedures, NGO's and role of social worker in different settings. 5. Application of Administration process in Service Organizations
PISWD20	**IEC- SOCIAL WORK PROFESSION IN DIFFERENT SETTINGS**	1. Gain a opportunity in understanding and apply in contemporary fields of social work profession. 2. Able to influence the practices and the professional skills of social worker in different settings like individual, groups, community, Hospital settings, correctional settings and vulnerable groups. 3. Understand a roles and functions of social work profession in field. 4. Gain and understand the knowledge about various national and international agencies. 5. Able to understand the Problems faced by professional social workers
PCSWK20	**RESEARCH PROJECT**	
PCSWL20	**CONCURRENT FIELD WORK IV**	1. Demonstrate ability to analyse the social situations of individuals, groups and communities 2. Understand the role of organisations and Practice the values, principles and ethics in fields of Social Work 3. Work and Develop competency in identifying and applying the different methods of Social Work appropriately

		4. Identify and facilitate solutions of individual, group and community problems through the application of Social Work skills 5. Demonstrate competency in planning, identifying and mobilising resources to organise programmes and meet needs of different target groups
PPSWB20	**INTERNSHIP PROGRAM (BLOCK PLACEMENT)**	

<table>
<tr><td colspan="3" align="center">**MBA**</td></tr>
<tr><td>PCBAA20</td><td>**MANAGEMENT PROCESS**</td><td>1. Attain the knowledge of the functions and importance of management.
2. Be confident on the planning and decision making process involved in organization as well as in personal life.
3. Come to know about the types of organization and equip themselves accordingly in their career ahead.
4. Understand the process of recruitment, selection and appraisal, the students prepare themselves to meet the needs of the industry.
5. Adopt a style of leadership and practice controlling techniques when they start their career in the field.</td></tr>
<tr><td>PCBAB20</td><td>**ORGANIZATIONAL BEHAVIOR**</td><td>1. Asses an organization and classify the contributing disciplines, approaches to OB
2. Acquire knowledge in applying personality traits and motivational theories.
3. Analyze the behavior of individuals and groups in organizations in terms of key factors.
4. Ability to comprehend the leadership skills and effective communication systems.
5. Assess the potential effects of organizational factors develop skills in handling stress and manage Quality of work life.</td></tr>
<tr><td>PCBAC20</td><td>**ECONOMICS FOR MANAGEMENT**</td><td>**1.** Understand the concept of Economics
2. Acquire the acquaintance of Demand and Supply
3. Apply the Conception of Cost Production Function
4. Understand the assumption of pricing and Market competition
5. Acquire the knowledge on Macroeconomics, Inflation</td></tr>
<tr><td>PCBAD20</td><td>**ACCOUNTING FOR MANAGEMENT**</td><td>1. Be able to acquire depth knowledge in Accounting and w capable of preparing financial income statement and fir balance sheet.
2. Be capable of preparing analysis and interpreting fir statements using various tools.
3. Gain knowledge how to prepare fund flow statement and flow statement and using the same for decision maki business.
4. Gains knowledge on the concepts of management and accounting techniques, preparation of cost. sheet, valuati stock, pricing of material issues and prepare accounting for</td></tr>
</table>

		wise production under different process.
		5. Acquire Knowledge to help the management in decision mak the form of preparing budgets and price fixation.
PCBAF20	MANAGEMENT INFORMATION SYSTEM AND TECHNOLOGY	1. Understand about management information system concepts and resources.
		2. Be able to analyze various concepts of information technology.
		3. Be able to classify the different functional business systems using information system and technology and can implement in their organization.
		4. Enhance the planning and developing skills and master in business IT environment.
		5. Adhere ethical responsibility of business concepts.
PJBAA20	BUSINESS LAB – I: ENGLISH FOR PROFESSIONAL COMMUNICATION	1. Apply the basics of speaking English in everyday conversation and professional need.
		2. Ability to draft letters based on the requirement
		3. Acquire the ability to write reports, agenda and minutes of a meeting
		4. Prepare and make appropriate business presentations
		5. Increase employability quotient with professional and ethical responsibilities
PJBAB20	PRACTICAL – I: MS OFFICE AND ADVANCED EXCEL	1. Master in the use of strategies, such as mail merging, creating articles.
		2. Draft and to animate the presentations using power point
		3. Analyse formulas and feeding the data in the excel
		4. Develop and create charts and pivot table
		5. Enhance and develop their ability to solve using conditionals and lookup functions in advanced excel.
PCBAG20	SUPPLY CHAIN MANAGEMENT	1. Acquire knowledge on Supply Chain activities in the market and implement Supply Chain Management.
		2. Evaluate the various networks and its flaws.
		3. Distinguish the various inventory models in supply chain.
		4. Implement the supply chain network for logistics.
		5. Elaborate the current trends and technological implementation in the supply chain environment.
PCBAH20	MARKETING MANAGEMENT	1. Demonstrate the strong conceptual knowledge in marketing and its functions.
		2. Be able to segment the customer and identify their behavior.
		3. Aware of all the 4 P's of marketing mix and its importance in implementing marketing strategies.
		4. Utilize the available marketing channels in optimum levels.
		5. Updated with the recent types of marketing and will be motivated towards marketing research.
PCBAI20	HUMAN RESOURCE MANAGEMENT	1. Acquire Knowledge on the perspectives of HRM
		2. Understand the formation of the concept of Best Fit Employee for ajob
		3. Study the Process of Executive and Career Development

		Programme
		4. Understand the concepts, Benefits, of Sustaining Employee Interest
		5. Acquires knowledge on Challenges in HRM .
PCBAJ20	FINANCIAL MANAGEMENT	1. Be well-versed in the financial decision, functions and org of financial managements. The can also come out with know value bonds and shares in practice.
		2. Can come out with the practical knowledge of evaluatin investment using traditional and modern capital budgeting m
		3. Gain practical knowledge in calculating cost of different cap
		4. Acquire knowledge over capital structure and work ou structure under different approaches. Students also gain knowledge over dividend policy and its determinants.
		5. Gain both theoretical and practical knowledge on working ca management including receivables, payables, inventory and management.
PCBAL20	ENTERPRISE RESOURCE PLANNING	1. Understand how ERP is evolved and analyze various ris ERP
		2. Be able to integrate and analyze related technologies with and also to understand the entire product life cycle starting manufacturing till SCM and CRM
		3. Be able to classify the legacy system with ERP system and to apply various transition strategies according to organization
		4. Can analyze the success and failure factors and will be ab apply the success factors in post implementation phase
		5. Understand and use the idea of SAP AG, SAP Net weaver i enterprise.
PJBAC20	INNOVATION AND START-UP MANAGEMENT	1. Have the ability to discern distinct entrepreneurial traits
		2. Write a business plan.
		3. Be able to know the parameters to assess Opportunities for new business ideas.
		4. Understand the Governmental schemes for entrepreneurial growth in India.
		5. Know to register in e-commerce, trade mark and patent.
PJBAD20	ACCOUNTING SOFTWARE	1. Understand and learn the various accounting packages and the basics of Tally Erp 9.0
		2. Be able to enter accounting vouchers and to print profit and loss and Balance Sheet.
		3. Be able to prepare inventory and stock items for an organization and print the stock summary report.
		4. Understand how to create and maintain cost categories, cost centres of a product for easy processing of sales and purchase inventories.
		5. Analyze the financial statements using ratio analysis and interpreting the results thereof.
PCBAM20	BUSINESS LAW	1. Acquire Knowledge on Commercial law
		2. Understand the formation and need for Company law
		3. Study the requisites of Negotiable Instrument and

		registration of firm
		4. Understand the concepts and scope of Value Added Tax and Information Act
		5. Acquires knowledge on Consumer Protection Act and Cyber Laws.
PCBAN20	**STRATEGIC MANAGEMENT**	1. Understand the strategic decisions that organizations make and have an ability to engage in strategic planning.
		2. Explain the basic concepts, principles and practices associated with competitive advantage.
		3. Integrate and apply knowledge gained in basic courses to the formulation and implementation of strategy from holistic and multi-functional perspectives
		4. Analyze and evaluate critically real life company situations and develop creative Solutions, using a strategic management perspective.
		5. Understand the crucially important role that the HRM function plays in the setting and implementation of an organization's strategy.
PJBAE20	**STOCK TRADING**	1. Understand the basics in stock market and stock exchanges
		2. Study the capital market and trading settlement
		3. Understand the stock charts and signals.
		4. Understand the financial derivatives contracts
		5. Learn the mutual funds and its investment modes
PJBAF20	**INSTITUTIONAL TRAINING**	1. Integrate the theoretical knowledge with the real work experience
		2. Create interest in the area of specialization
		3. Experiential learning in the various functions of the organization.
		4. Build a record of work experience and to develop habits and attitudes necessary for job success
		5. Acquire employment contacts leading directly to a full-time job following graduation
PCBAO20	**PRODUCTION AND OPERATIONS MANAGEMENT**	1. Appreciate the principles and applications relevant to the production and operation systems of manufacturing/service f
		2. Reveal the ability to apply some forecasting techniques, enla basic materials requirement schedules and develop an aggreg plan and describe the boundaries of an operations system, an recognize its interfaces with other functional areas within the organization and with its external environment.
		3. To understand techniques of location and facility planning; l balancing; job designing; and capacity planning in operation management.
		4. Plan and implement suitable materials handling principles ar practices in the operations.
		5. Plan and implement suitable quality control measures in Quality Circles to TQM.
PCBAP20	**INTERNATIONAL BUSINESS AND ETHICS**	1. Understand the emergence and needs of Globalization in Business and acquire the concepts of International Business theories and Strategies.

		2. Study the requisites of FDI & Global Monetary System. 3. Understand the Culture Differences in Business. 4. Acquire the knowledge on Ethics in the workplace. 5. Analyze the Ethical issues and challenges.
PEMKA20	ELECTIVE I A - RETAIL MARKETING	1. Be provided with a comprehensive view of retailing and rural marketing in the distribution component. 2. Come to know about the various operational and administrative aspects of the ever growing retailing. 3. Come to know the application of marketing concepts in a practical retail managerial environment 4. Gains understanding about the globalization of the retail industry and its Opportunities 5. Understand and investigate the changing role of internet and use of technology in Retailing.
PEMKB20	ELECTIVE I B - SERVICES MARKETING	1. Have thorough understanding of services marketing, 2. Acquires knowledge of services strategies including service product and delivery 3. Gains knowledge of competitors and learns the strategies to be adopted 4. Come to know the Customer Service oriented mindset and fill the service gaps. 5. Acquire in depth understanding of the challenges in managing and delivering the quality services.
PEMKC20	ELECTIVE I C - ADVERTISING AND SALES PROMOTION	1. Understand advertising management with regard to 4 P's of marketing mix. 2. Be able to design an advertising for the different media. 3. Gain importance of practicing ethical behaviour in advertising. 4. Acquire knowledge in various types of promotional techniques in detail. 5. Be able to estimate and allocate the budget in adopting promotional techniques.
PEFNA20	ELECTIVE II A - SECURITY ANALYSIS AND PORTFOLIO	1. Understand the various alternatives available for investment. Gain knowledge of the various strategies followed by investment practitioners. 2. Gain knowledge in the financial market and SEBI regulations. 3. Understand fundamental analysis in the Economy, Industry and company 4. Identify the chart patterns used to depict the stock market. 5. Measure risk and return and find the relationship between risk and return.
PEFNB20	MERCHANT BANKING AND FINANCIAL SERVICES	1. Understand the role of merchant bankers in the issue management activities and familiarize with the SEBI regulation 2. Know about the capital market and its functioning 3. Examine financial services as an important and contemporary area of financial management 4. Acquire the financial evaluation technique of leasing,

		venture capital and hire purchase 5. Gain a deep understanding on credit rating and its regulations
PEFNC20	**ELECTIVE II C - RISK MANAGEMENT AND DERIVATIVES**	1. Understand the concepts on risk and its sources 2. Gain knowledge in risk management techniques 3. Understand the concepts of financial derivatives. 4. **G**ain knowledge in the derivatives markets in India 5. Acquire knowledge and skills in the advanced financial derivatives.
PEHRA20	**ELECTIVE IIIA - COMPENSATION MANAGEMENT**	1. Understand the concept of the compensation system and the pay model. 2. Attain in depth understanding of the evaluation of the job and its description 3. Acquire the knowledge about the design and examine the pay level based on the person competencies. 4. Acquire and absorb knowledge based on the benefits and services provided in the form of wages and salaries 5. Acquires the knowledge about the level of pay based on the performance and the market competitiveness
PEHRB20	**ELECTIVE III B - TRAINING AND DEVELOPMENT**	1. Understand the concepts, process, models and approaches involved in training 2. Explain the training design and interpret the various learning dimensions. 3. Apply training methods based on the nature of the groups. 4. Integrate various training methods in classroom and professional environment 5. Understand and apply the assessment and model of evaluation.
PEHRC20	**ELECTIVE I C- INDUSTRIAL RELATIONS**	1. Expertise on Industrial Concept and Labour Force in India 2. Understand the concept, formation, types of Trade Union in India and its Functions 3. It enables learners to gain in depth acquaintance on resolution of Disputes and Maintain Industrial harmony 4. Understand the nature, causes of Grievance Procedure and the maintenance of Successful Collective Bargaining 5. Learners acquire essential awareness on the Technological changes involved in maintaining Industrial Relations.
PESSA20	**ELECTIVE IV A - CLOUD COMPUTING**	1. Understand how Cloud is evolved and will come out with good conceptual knowledge in Cloud Computing 2. Analyze the services, and platforms in Cloud **3.** Come with awareness on various cloud providers 4. Attain knowledge of Gridding and networking 5. Enable the students to have a skill with Internet of Things
PESSB20	**ELECTIVE IV B - DIGITAL BUSINESS AND E COMMERCE**	1. Understand about emergence of E-commerce 2. Analyze various technologies used to develop digital busines environment **3.** Understand the concepts of E- marketing and Digital paymen **4.** Students adhere to the values and ethics relevant to the digita

		payment in business environment
		5. Have knowledge to establish new strategies and master in E-Commerce.
PESSC20	**ELECTIVE IV C - DECISION SUPPORT AND BUSINESS INTELLIGENCE**	**1.** Enable the student to understand about decision support systems
		2. Able to analyze various phases of decision making and components of decision support system
		3. Understand the modeling approaches of decision making and can implement in their organization.
		4. Be able to enhance the data mining skills by applying knowledge discovery
		5. Master in decision making skills on analyzing the data warehousing and mining concepts.
PEHCA20	**ELECTIVE V A - HOSPITAL DESIGN AND OPERATION MANAGEMENT**	1. Understand and infer the importance of hospital planning and identify the factors influencing outcomes To identify, understand and differentiate the various steps involved in hospital planning
		2. Understand, recognize and interrelate the steps involved in hospital planning
		3. Gain the knowledge in the functions and requirements of various clinical services in the hospital
		4. Understand the functions and requirements of various support services in the hospital
		5. Be able to develop, plan and implement engineering services for the hospital.
PEHCB20	**ELECTIVE V B - HOSPITAL MATERIALS AND EQUIPMENT MANAGEMENT**	1. Understand and interpret the role of materials management in the hospital. To understand, recognize and interrelate the components of purchase system in materials management
		2. Understand, recognize and interrelate the components of purchase system in materials management. To develop and critique a purchase system for the hospital
		3. Understand, interrelate aspects, develop and critique the stores system for the hospital
		4. Be able to plan and implement equipment purchase and utilization assessment systems
		5. Recognize the importance of new technologies and trends in materials management and select the appropriate methods for sustainable economic and efficient functioning To plan and develop long term strategies for materials planning in the hospital.
PEHCC20	**ELECTIVE V C - HOSPITAL QUALITY MANAGEMENT AND LEGAL ASPECTS**	1. Understand and distinguish the role of management and healthcare indictors in the hospital
		2. Understand, recognize and interrelate the functions of various clinical services in the hospital
		3. Recognize and interrelate the functions of various non-clinical services in the hospital
		4. Gain knowledge various aspects of quality in the hospital from the viewpoint of accreditation and certification

		5. Understand the various legal requirements for hospitals and design effective methods to ensure legal compliance in the hospital.
PELMA20	ELECTIVE VI A – LOGISTICS MANAGEMENT	1. Analyze how logistical decisions (e.g., facilities, inventory, and transportation) impact the performance of the firm as well as the entire supply chain. 2. Analyze the strengths and weaknesses of packing and the emerging trends in the same. 3. Develop the strategies that can be taken to find the best paths to route vehicles to deliver and collect goods at multiple stops. 4. Develop strategies logistics reengineering and compete with the latest technology. 5. Know the basic characteristics of inbound and outbound logistics.
PELMB20	ELECTIVE VI B – EXPORT AND IMPORT MANAGEMENT	1. Remember the basics of global trade and import and export policies 2. Understand various import process and procedures and agencies involved in EXIM process and their role in the international trade 3. Acquire knowledge on the various modes of transportation. 4. Understand the payment methods, risks and various financing of water carriers. 5. Elaborate the procedures of Air Carriers.
PELMC20	ELECTIVE VI C - GREEN SUPPLY CHAIN AND LOGISTICS MANAGEMENT	1. Remember the basics of Green Supply Chain Management. 2. Understand various procedures in ECO Design with its drivers. 3. Acquire knowledge on green purchasing. 4. Understand the concepts in green manufacturing and its challenges. 5. Be aware on green logistics and its drivers.
PCBAQ20	PROJECT	1. Compare and contrast several existing solutions for research challenge 2. Formulate and propose a plan for creating a solution for the research plan identified 3. Conduct a survey of several available literature in the preferred field of study 4. Be able to report and present the findings of the study conducted in the preferred domain 5. Demonstrate an ability to work in teams and manage the conduct of the research study
PIBAA20	INDEPENDENT ELECTIVE PAPER – 1- MANAGEMENT CONCEPTS IN THIRUKKURAL	1. Acquire Knowledge on Verses of Thirukkural in Business Ethics 2. Understand the formation and need for Decision Making Process and Leadership 3. Study the requisites of Goal Setting and Capital Investment Decision

		4. Understand the Concepts and Scope of Social Responsibility and Stress Management
		5. Acquire knowledge on Personnel Selection and Welfare.
PIBAB20	INDEPENDENT ELECTIVE PAPER - 2 - DISASTER MANAGEMENT	1. Understand the knowledge about the concept of Disaster
		2. Attain in depth understanding of the various dimensions and typology of disasters
		3. Acquire the knowledge differentNational& International Agencies for disaster Management in India
		4. Acquire the knowledge and information related to Disaster Mitigation, Preparedness & Planning
		5. Empower and inhibit the knowledge about the Disaster Rehabilitation & Futuristic Sustainable Measures adopted.
PIBAC20	INDEPENDENT ELECTIVE PAPER – 3- INDUSTRIAL SAFETEY AND POLLUTION MANAGEMENT	1. Acquire Knowledge on Industrial safety Management
		2. Understand the formation and need for insight on Industrial Accidents
		3. Attain knowledge in the requisites of legal provisions towards Safety
		4. Understand the concepts of Environmental Management
		5. Acquires knowledge on Environmental Pollution Act.
PIBAD20	INDEPENDENT ELECTIVE PAPER – 4- EVENT MANAGEMENT	1. Understand the emergence and needs of the Event Management
		2. Analyze the Nature of Conference Markets
		3. Have the ability to understand the Contract Negotiations
		4. Attain the skills in event management and Customer care management
		5. Evaluate the Tourism Growth and Travel Industry Fairs
PIBAE20	INDEPENDENT ELECTIVE PAPER – 5- FAMILY BUSINESS MANAGEMENT	1. Understand the emergence and needs of Family Business
		2. Acquire the concepts of Family Culture, and its Employment Policy
		3. Gain the knowledge in possession of Family Business
		4. Understand the progression of Family Business
		5. Acquires the knowledge on Strategic planning for Family Business
PIBAF20	INDEPENDENT ELECTIVE PAPER – 6- MALL MANAGEMENT	1. Understand the Emergence and Development of Shopping Mall
		2. Acquire Knowledge on Revenue Model of the mall
		3. Gain knowledge in the Promotional Activities of Mall
		4. Investigate the Facilities Required for Mall Management
		5. Obtain the Awareness on Upcoming Mall Challenges
PIBAG20	NDEPENDENT ELECTIVE PAPER – 7- INNOVATION AND CREATIVITY	1. Acquire Knowledge on the Outlook of Creative Thinking
		2. Enrich the Creative Thinking of Individuals
		3. Be able to acquire essential knowledge needed for building creativity lifelong
		4. Gain in depth knowledge in Strategy Innovation
		5. Acquires knowledge on Managing Innovation
PIBAH20	INDEPENDENT ELECTIVE PAPER – 8- RURAL	1. Understand the factors that influences the rural market environment.
		2. Analyse rural market potential and Opportunities in regard

	MARKETING	with the consumption pattern of the rural population.
		3. Understand and apply the various pricing in relation to the quality of the product and the need.
		4. Identify the efficient marketing strategies in relation to the channels which influence decision making of the rural customers.
		5. Gain insight about the adequate and effective promotion and distribution strategies
PIBAI20	**INDEPENDENT ELECTIVE PAPER – 9- TRAVEL AND TOURISM MANAGEMENT**	**1.** Have basic understanding in Travel and Tourism Management
		2. Accustom on Tourism and Transport the different types of transport
		3. Procure knowledge on endorsement of Travel Agents
		4. Gain knowledge in the characteristics of Travel Agencies
		5. Be educated the on Tourists Conduct Motives and behavior
PIBAJ20	**INDEPENDENT ELECTIVE PAPER – 10- CYBER SECURITY AND LAWS**	1. Enable the student to understand about cybercrime and risk in Systems
		2. Analyze application securities enable students to understand the type of hackers and the techniques
		3. Be able to classify Security threats Security issues in hardware and able to implement in work place
		4. Adhere to the values and ethics relevant to the Cybercrime in business environment.
		5. Establish awareness in current issues from diverse aspects online transactions
PIBAK20	**INDEPENDENT ELECTIVE PAPER 11 - MANAGEMENT OF MULTI NATIONAL CORPORATION**	1. Understand international management with various schools of thoughts along with the problems faced by host countries.
		2. Demonstrate the ability to apply different management styles.
		3. Demonstrate the ability to effectively work in teams in various MNC's.
		4. Demonstrate strategies , ethical values and CSR in business.
		5. Identify and describe the complexities of managing international mergers and acquisitions and understand the challenges and opportunities of global scenario.
PIBAL20	**INDEPENDENT ELECTIVE 12 - WORK LIFE BALANCE AND EMOTIONAL INTELLIGENCE**	1. Assess an organization and introduce to work life Balance insisting on spirituality in the work place.
		2. Acquire knowledge critical thinking, interpersonal relations and conflict management.
		3. Enhance creativity and get an in depth knowledge on event management.
		4. Ability to comprehend Emotional Intelligence with is concepts and nature.
		5. Assess the potential effects emotions with the various process in the Organization.

PCCOA20	**ADVANCED CORPORATE ACCOUNTING**	1. Prepare consolidated final accounts of holding and subsidiary companies. 2. Illustrate and compute the accounts of electricity companies. 3. Demonstrate about the accounts of life insurance companies. 4. Comprehend the generally accepted accounting principles and accounting standards and to elucidate the procedures of liquidation of companies. 5. Understand and acquire knowledge on human resources accounting and inflation accounting.
PCCOB20	**DIRECT TAXATION - I**	1. Define and understand the residential status of assessees. 2. Calculate gross and net salary based on the provisions of the Act 3. Find out income from house property of the assessees 4. Compute the income from business or profession based on various related provisions and to calculate taxable and exempt capital gains 5. Find out the taxable income under the head Income from other sources
PCCOC20	**ORGANISATIONAL BEHAVIOUR**	1. Understand the concepts of organisational behaviour. 2. Analyse the factors influencing personality perception, values, attitudes and beliefs of human behaviour in organisation. 3. Understand and classify the techniques of group decisions and reasons for organizational change. 4. Discuss the reasons for organisational conflict and its consequences. 5. Understand the symptoms of stress and formulate measures to deal with stress.
PCCOD20	**FINANCIAL SERVICES AND MARKETS**	1. Understand the functions of financial markets and services 2. Attain empirical knowledge about venture capital and functioning of credit rating agencies 3. Acquire knowledge on the concepts of mutual funds and its regulations 4. Procedural knowledge on the development and functions of financial market instruments 5. Understand the functioning of Government securities market.
PECOA20	**ELECTIVE IA: COMPANY LAW**	1. Familiarise the meaning of a company, its types and highlights of The Companies Act, 2013 2. Get insight of the formation procedure of a company 3. Understand the key managerial personnel of a company, their rights, duties and responsibilities 4. Gain knowledge about the type of company meetings, its procedure and secretarial duties with regard to meetings 5. Cognise the constitution of audit committee and its importance to a company with winding up procedure

PECOB20	ELECTIVE IB: CUSTOMER RELATIONSHIP MANAGEMENT	1. Gain knowledge of customer relationship and its management 2. Apply the knowledge in the business process and other associated activities 3. Analyse the phases of relationship marketing 4. Apply the strategies in various relevant programmes 5. Become aware various models of CRM and use of technology in CRM
PICOA20	INDEPENDENT ELECTIVE IA: RISK MANAGEMENT	1. Gain knowledge of the basics of risks and risk management 2. Familiarise with the sources of risks in various fields like banking and currency exchange 3. Gather skills to manage risks at the corporate level 4. Acquire skills to manage risks using derivatives as tools 5. Understand the areas of risks and manage the same
PCCOE20	INDIRECT TAXATION: LAW AND PRACTICE	1. Understand the concept of indirect taxation 2. Get insight on the concept of Goods and Service Tax. 3. Cognise on supply and goods in Goods and Service Tax. 4. Illustrate problems by using various provisions of Goods and Service Tax. And various procedures for registration 5. Understand the concept of Customs Act and to elucidate and compute Customs duty with Goods and Service Tax
PCCOF20	DIRECT TAXATION - II	1. Understand the concept of clubbing of incomes of assesses 2. Gain knowledge of Carrying forward and set off of losses under different heads of income 3. Compute the total income of individuals after considering deductions, rebate and relief 4. Assess the taxable income of Firms and compute the tax liability of firm and partners 5. Assess the taxable income of Companies and Co-operative societies compute the tax liability
PCCOG20	RESEARCH METHODOLOGY	1. To understand the concept of research methodology 2. To collect and compile data for the purpose of research 3. To get in depth knowledge on sampling and sampling methods 4. To analyse and present the data using statistical tools 5. To construct research report
PCCOH20	BANK FINANCIAL MANAGEMENT	1. To demonstrate on correspondent banking system and its functions 2. To be informed about letter of credit and various rules governing letter of credit. 3. To ascertain the knowledge on foreign exchange and its operations. 4. To manage and hedge risks involved in forex business. 5. To be aware on various components of banks balance sheet
PECOC20	ELECTIVE II A: INTERNATIONAL MARKETING MANAGEMENT	1. To understand the concepts and approaches of international marketing. 2. To construct the knowledge on product awareness, pricing system and methods of physical distribution in

		international trade.
		3. To acquaint skills to promote product internationally.
		4. To identify various channels of distribution for oversees market.
		5. To determine various factors contributing to global trade and to manage such risks in international marketing
PECOD20	ELECTIVE II B: MANAGEMENT OF FINANCIAL DERIVATIVES	1. Gain knowledge of the basics of derivatives and instruments involved in the same
		2. Acquire knowledge of the different types of contracts and its role in foreign exchange
		3. Become acquainted with the various models related to derivatives and different markets
		4. Apply the theories in real life situations
		5. To decide when an investment has to be made
PICOB20	INDEPENDENT ELECTIVE II A: MANAGERIAL ECONOMICS	1. To analyse the demand situation in the market and the factors affecting demand for a product
		2. To forecast the costs involved in a business and understand the theories of production
		3. To assess the different types of markets prevalent in the economy and the pricing policies used
		4. Compute national income of a country with knowledge about its components
		5. Assess the validity of Foreign Direct Investments in the macro economic environment
PCCOI20	ADVANCED COST AND MANAGEMENT ACCOUNTING	1. To teach the students the advanced techniques in Cost and Management Accounting, enabling corporate reporting and decision making
		2. Compute profits or losses of processes through equivalent production units
		3. Analyse the profitability of contracts by preparing Contract Accounts
		4. Ascertain and assess variances in material, labour, overheads and sales using Variance Analysis
		5. Prepare Funds flow statement and find out the increase or decrease in working capital
PCCOJ20	SERVICES MARKETING	1. To understand the concept of services marketing and services sectors in India
		2. To analyse and forecast demand situations and patterns in service sectors
		3. To develop skills on producing products to meet out the needs of target market
		4. To segment market into different groups based on various factors
		5. To get insight knowledge on consumer behaviour and need for customer relationship
PCCOK20	ADVANCED BUSINESS STATISTICS	1. Determine and use partial and multiple correlation and regression.
		2. Create awareness on non-parametric tests and their

		application in research real life situation. 3. Frame and test a hypothesis and ability to determine statistical significance between two variables. 4. Apply and compute chi-square and test a hypothesis on specific value of population variance. 5. Apply, compute and interpret f-distribution and ANOVA.
PCCOL20	HUMAN RESOURCE MANAGEMENT	1. Imbibe the knowledge on human resources management and its functions. 2. Design and analyse a job in organisation. 3. Evaluate a job in organisational structure. 4. Assimilate the knowledge on career development and to develop career path to employees of an organisation. 5. Identify and appraise performance of employees of an organisation.
PCCOM20	INTERNSHIP TRAINING PROGRAMME	1. Handle the accounts of any type of concern 2. File Income tax returns of individuals, firms and other type of organisations 3. File GST returns of individuals, firms and other type of organisations 4. Conversant with the procedures for claiming Insurance claims on various occasions 5. Manage the human resource of organisations
PECOE20	ELECTIVE III A: PRINCIPLES OF INSURANCE	1. To understand the basic principles of insurance. 2. To elaborate the principles of life, fire, marine, motor vehicle, health and miscellaneous insurances 3. To assess various policies and to illustrate settlement of claims 4. To file claims in case of happening of the event or on maturity of the policy 5. To comprehend the laws of insurance according to the IRDA Act.
PECOF20	ELECTIVE III B: PRINCIPLES OF EVENT MANAGEMENT	1. Become aware of the basics of Event Management and duties of an Event Manager 2. Hold events of various Government and Local authorities 3. Acquire knowledge about planning for conducting events 4. Familiarise with the importance of media for organising events 5. Prepare oneself as a Master of Ceremony
PICOC20	INDEPENDENT ELECTIVE III A: TOTAL QUALITY MANAGEMENT	1. Understand the concept of Quality Control and the procedures for implementing quality 2. Gain knowledge about customer satisfaction and customer relations management and the dimensions of service quality 3. Associate the importance of quality standards for human resource management 4. Frame quality standards for all aspects of the organisation 5. Practice the quality parameters as required by government regulations
PCCON20	FINANCIAL	1. Comprehend financial management and financial planning

	MANAGEMENT	2. Apply general management principles to financial resources of a business
		3. Identify and use various financial instruments to increase the potential return of investments
		4. Determine capital and working capital requirement of a business
		5. Analyse the cost of capital through various theories
PCCOO20	**INDUSTRIAL RELATIONS AND LABOUR LAWS**	1. Understand the significance of Industrial relations in organizations
		2. Gain knowledge on the process and procedures to handle industrial disputes
		3. Good base of labour laws and computation methods of compensation
		4. Acquainted with the concept, principles and functions of trade union, collective bargaining and workers' participation in management
		5. In-depth knowledge of laws relating to Payment of Wages Act and Factories Act and its judicial set up
PCCOP20	**ENTERPRISE RESOURCE PLANNING AND TALLY**	1. Gain knowledge about the various Enterprise Resource Planning soft wares
		2. Understand the technologies associated with ERP
		3. Decide about a software suitable for the type of business of their choice
		4. Understand the theoretical aspects of Tally Software and its application in various areas of a business
		5. Prepare financial statements and extracts reports in existing ERP model
PCCOQ20	**TALLY (PRACTICALS)**	1. Post transactions in Tally Software and generate required reports and financial statements
		2. Calculate GST for various purchase and sales transactions
		3. Compute and ascertain outstanding interests, bills receivable and payable using Tally Software
PCCOR20	**PROJECT**	1. Conduct a survey about a topic on Commerce, Marketing, Finance or Social Sciences
		2. Prepare a Research Report on the study and its findings using relevant data analysis
		3. Suggest to organizations and the society regarding various research problems
PECOG20	**ELECTIVE IV A: BUSINESS ENVIRONMENT**	1. Familiarize with business environment and financial system
		2. Cognise on economic and non-economic environment
		3. To understand the constitutional and legal environment in India
		4. To facilitate the knowledge on socio-cultural environment
		5. To be aware on technical and global environment
PECOH20	**ELECTIVE IVB: LEGAL ASPECTS OF BUSINESS**	1. To familiarize with the role of various personnel in governing corporate entities
		2. To file a complaint in case of any injustice happening to a consumer

		3. To understand the importance of patents, copyrights, etc. and also the mode of safeguarding one's intellectual property right 4. To facilitate the knowledge on laws governing cyber activity and information technology 5. To comprehend any insurance policy or scheme
PICOD20	INDEPENDENT ELECTIVE IV B: ENTREPRENEURIAL DEVELOPMENT	1. To develop entrepreneurial skills and start up a new business. 2. To understand and acquire knowledge on support services provided to entrepreneurs by different agencies for entrepreneurial development. 3. To identify and formulate business proposals. 4. To understand the role of government in entrepreneurial development. 5. To understand the position and problems faced by women entrepreneurs.
M.Sc BIOCHEMISTRY		
PCBCA20	BIOMOLECULES	1. Outline the structural features, properties and biological importance of carbohydrates 2. Attain idea on the structural and biological aspects of proteins 3. Examine the structure of nucleic acids, its isolation and sequencing techniques 4. Gain knowledge on the structure, different forms and significance of lipids in the system 5. List out the significance of vitamins, its deficiency diseases and about the porphyrin ring containing molecules in living system
PCBCB20	HUMAN PHYSIOLOGY AND NUTRITION	1. Outline the physiological system of the human body 2. Describe the general function of each organ system 3. Assess the activities of organs for maximum efficiency 4. Explain the physiology of muscle and neurotransmitters 5. Utilize knowledge on nutrients with their deficiencies
PCBCC20	CELL BIOLOGY	1. Relate cell as basic unit of life, its structure, organization and importance of molecular motors 2. Discuss about the various sub-cellular components of cells and its functions in the biological system 3. Assess the knowledge on techniques adopted for the identification of cellular components and cancerous cell 4. Identify the different types of cell-cell communication and its significance 5. Describe clearly about the mechanism of cell signalling and cell death
PEBCA20	ELECTIVE I A: BIOPHYSICAL CHEMISTRY	1. Demonstrate the concept of bioenergetics and its importance 2. Describe the spectroscopic techniques – NMR,UV and MS 3. Define and recognize covalent bonding between atoms in molecules. 4. Classify organic molecules by their functional groups

		5. Compare the isomeric relationship
PEBCB20	**ELECTIVE I B :** **PHARMACEUTICA** **L BIOCHEMISTRY**	1. Outline the basic scientific concepts related to mechanism of drug action 2. Assess the drug tolerance and the factors that modify the effect of drugs 3. Explain the use of genetically engineered methods on novel drug delivery systems 4. Discuss the mechanism of action of drugs in the therapy of specific diseases 5. Use the medicinal plants in drugs as a curative
PCBCD20	**ANALYTICAL** **BIOCHEMISTRY**	1. Identify the behavior of molecules and prioritize related analytical tools 2. Interpret and use the results from a given chromatographic technique 3. Apply the electrophoretic techniques for the separation of proteins and nucleic acids 4. Pursue knowledge about centrifugation and radioactivity and critically assess advances with in the field 5. Categorize, evaluate and implement a suitable technique for a given analytical problem
PCBCE20	**ENZYMOLOGY**	1. List the enzyme properties, nomenclature and purification of enzymes 2. Apply the biochemical calculation for enzyme kinetics 3. Compare methods for enzyme catalysis and various methods of inhibition 4. Outline the effect of coenzymes and isoenzymes in enzyme catalysis 5. Explain various industrial and clinical applications of enzymes as a catalyst in industries and also as a therapeutic aid
PCBCF20	**INTERMEDIARY** **METABOLISM**	1. Restate in own words how reduced electron carriers are used to generate ATP via Electron Transport System in Mitochondria 2. Translate the reactions catalyzed by different Enzymes in metabolic pathway 3. Compare the important characteristics of metabolic pathways and assess their regulation 4. Analyze complex chemical reactions and draw logical conclusion by interrelating metabolism 5. Interpret how plants convert energy to nourish themselves
PEBCC20	**ELECTIVE II A:** **ECOLOGY,** **EVOLUTION AND** **DEVELOPMENTAL** **BIOLOGY**	1. Outline the concept of ecosystem and its interaction 2. Apply the concept of evolution in population genetics 3. Describe the structures and the development of the embryo at different stages 4. Explain the insight on morphogenesis and organogenesis in plants 5. Schematize pedigree analysis and genetic mapping

PEBCD20	**ELECTIVE II B: TOXICOLOGY**	1. Outline the scope and factors influencing toxicology 2. Explain the clinical and laboratory findings in the treatment of acute toxic exposures 3. Assess various methods of toxicity testing 4. Discuss the effects of toxic substances on molecular and cellular levels 5. Use the knowledge of air pollutants in the assessment of occupational hazards
PCBCG20	**MAIN PRACTICAL - I**	1. Discuss qualitative and quantitative analysis of various biomolecules 2. Explain the isolation of biomolecules from biological samples 3. Apply the practical knowledge to determine hemoglobin, clotting time and prothrombin time
PCBCH20	**MAIN PRACTICAL – II**	1. Identify and purify biomolecules in a mixture by chromatographic technique 2. Asses the optimum pH and optimum temperature of enzymes 3. Explain the basic principle involved in intermediary metabolism
PCBCI20	**ADVANCED ENDOCRINOLOGY**	1. Identify the structure and functions of endocrine glands and hormones 2. Demonstrate the mechanisms of hormonal action and the clinical disorders of hormones 3. Examine the symptoms of the patients and relate it to hormones 4. Identify the difference in the mechanism of cell to cell communication 5. Explain the differences between male and female gonads
PCBCJ20	**ADVANCED IMMUNOLOGY**	1. Identify various mechanisms that regulate immune response 2. Compare and contrast innate and adaptive immunity 3. Outline the cell types and organ present in the immune response 4. Discuss the reason for different vaccination 5. Communicate the adverse effect of immunodeficiency disorder
PCBCK20	**ADVANCED BIOTECHNOLOGY**	1. Illustrate the tools and strategies used in genetic engineering 2. Apply the knowledge of genetic engineering in problem solving and in practice 3. Categorize how plant and animal cells are cultured and genetically manipulated in laboratory 4. Make use of the various steps in the development of a biotechnology derived products 5. Report the applications of genetic engineering technique in basic and applied experimental biology
PEBCE20	**ELECTIVE III A: MICROBIOLOGY**	1. Recall the taxonomy, morphological features and division process of microbes

		2. Outline the microbial growth and its metabolism
		3. Apply the microbial culture technique
		4. Gain knowledge on the replication processes in microbes
		5. Identify the various infectious diseases, its causative agents and antimicrobial drugs
PEBCF20	**ELECTIVE III B: RESEARCH METHODOLOGY**	1. Design the research work
		2. Gain an idea on the role of biostatistics in research
		3. Understand the significance of internet in research
		4. Develop the understanding on database management system
		5. Practice the concepts of animal studies and CPCSEA guidelines in research
PCBCL20	**MOLECULAR BIOLOGY**	1. Demonstrate the nature and role of Gene in life activity
		2. Describe the blueprint of life and its functions
		3. Outline the mechanism of Replication
		4. Outline the role of Transcription
		5. Demonstrate the features of Genetic code and mechanism of Translation
PCBCM20	**ADVANCED CLINICAL BIOCHEMISTRY**	1. Apply the process of collection, preservation and storage of blood
		2. Communicate the disorders of carbohydrate metabolism
		3. Outline the significance of proteins and nucleic acid
		4. Compare the liver and renal disorders
		5. Discuss the role of diagnostic enzymes
PEBCG20	**ELECTIVE – IV A: PLANT BIOCHEMISTRY**	1. Identify various natural and artificial ways to propagate plants
		2. Discuss the function and composition of different plant structures
		3. Describe the processes of germination and plant growth
		4. Explain the role of plant growth regulators and plant tissue culture
		5. Perform the calculations to predict expected plants by experiments
PEBCH20	**ELECTIVE IV- B: HERBAL THERAPY**	1. Describe the concepts of Pharmacognosy
		2. Explain the classification of medicinal plants
		3. Outline the different parts of plant
		4. Predict the Herbal medicines for Human ailments
		5. Apply the knowledge on the important metabolic pathways in plants
PCBCN20	**MAIN PRACTICAL – III**	1. Analyse the prevalence and impact of endocrine hormone in regulating health
		2. Use the practical skill for diagnosing immunological reaction in relation to disease condition
		3. Apply tissue culture technique and fermentation process for various applications
PCBCO20	**MAIN PRACTICAL IV**	1. Apply the molecular tools and techniques for extracting and separating DNA
		2. Utilize practical knowledge and skill for diagnosing various diseases using biochemical analysis in blood

		specimen
		3. Demonstrate various pathological conditions related to abnormal constituents in urine
PIBCA20	**INDEPENDENT ELECTIVE I A: ORGANIC FARMING**	1. Analyze the importance of organic farming 2. Apply the concept of organic farming 3. Relate the importance of plant protection 4. Use the organic methods for plant cultivation 5. Plan the concept of income generation through organic farming and terrace gardening
PIBCB20	**INDEPENDENT ELECTIVE I B: FOOD PRESERVATION**	1. Outline the role of microbes in food spoilage and methods adopted to overcome microbial food spoilage 2. Apply the general methods for preserving fruits and vegetables 3. Find the methods of food preservation 4. Explain the methods for identifying food spoilage 5. Use the methods for preserving non-vegetarian foods/ meat products
PIBCC20	**INDEPENDENT ELECTIVE II A: HORTICULTURE**	1. Recall the significance of horticulture 2. Outline the impact of soil nature on horticulture 3. Apply the concept of hybrid to enhance yield 4. Gain knowledge on cropping techniques and harvesting methods 5. Identify the role of gardening in common places
PIBCD20	**INDEPENDENT ELECTIVE II B: CANCER BIOLOGY**	1. Describe the latest techniques in the diagnosis and treatment of cancer 2. Asses the contribution of environmental and genetic factors to cancer causation 3. Use inductive and deductive reasoning to evaluate the biological mechanisms that lead to the induction of cancer 4. Discuss the principle, clinical significance and cascade of metastasis 5. Examine the basic concepts of clinical research in oncology
PIBCE20	**INDEPENDENT ELECTIVE III A: NANOBIOTECHNO LOGY**	1. Apply the essential role of Nanoscience 2. Outline the prospective of Nano biology and Nano sensors 3. Discuss the Nanoparticle drug base delivery systems 4. Create knowledge to develop Nanomaterials 5. Identify the role of plants in Nanoparticle synthesis
PIBCF20	**INDEPENDENT ELECTIVE III B: STEM CELL TECHNOLOGY**	1. Relate the importance of stem cell therapy 2. Apply the concept of stem cell development 3. Analyze the importance of ethics in stem cell and gene therapy 4. Use hematopoietic stem cells in treating blood related disorders and diseases 5. Identify the importance of various stem cells in therapeutic applications
PIBCG20	**INDEPENDENT ELECTIVE IV A: PSYCHOLOGY**	1. Apply the principles of psychology in day-to-day life for a better understanding of oneself and others. 2. Compare and Contrast the biological basis of memory and

		forgetting.
		3. Describe Language acquisition and the role Language plays in Communication and Thought.
		4. Recognize the importance of Learning and Motivation.
		5. Critically evaluate the fundamental processes underlying human behavior.
PIBCH20	INDEPENDENT ELECTIVE IV B: ENTREPRENEURIAL BIOCHEMISTRY	1. Describe the dynamic role of entrepreneurship and small business.
		2. Identify and implement the role of entrepreneur towards society.
		3. Create and explain innovative business ideas and market opportunities.
		4. Generate bio-entrepreneurship and describe its components and forms.
		5. Develop and validate skills needed to run a business successfully.
M.Sc. CHEMISTRY		
PCCHA20	STEREOCHEMISTRY AND CONFORMATIONAL ANALYSIS	1. Assign the configuration of stereoisomers including those with no stereogenic carbon centre and classify the stereospecific and stereoselective reactions.
		2. Compare the relative stability and reactivity of conformational isomers of cyclohexane and related compounds.
		3. Ascertain the knowledge on the mechanism and stereo chemical outcome of aliphatic nucleophilic substitution reactions.
		4. Compare the mechanistic spectra of elimination reactions.
		5. Employ the principles of Optical Rotatory Dispersion and Circular Dichroism for various applications.
PCCHB20	STRUCTURAL INORGANIC CHEMISTRY	1. Summarize the theories of acids and bases.
		2. Discuss conductors, semiconductors and insulators based on band theory.
		3. Assess the structure and bonding in different types of ionic solids, metals and alloys.
		4. Discuss the structure and bonding in polyacids, silicates and inorganic polymers.
		5. Distinguish the structure and bonding in boranes, carboranes, metallo carboranes, boron nitrides and metal clusters.
PCCHC20	KINETICS AND PHOTOCHEMISTRY	1. Describe Activated Complex Theory in terms of translational and vibrational partition functions and apply it to derive the kinetics of reactions in solutions, Hammett and Taft equations and kinetic isotope effects in studying the mechanism of chemical reactions.
		2. Discuss the concepts and kinetics of homogeneous and heterogeneous catalysis and explain adsorption isotherms of Langmuir and BET.
		3. Derive the kinetics of complex reactions and apply the techniques of fast reactions.

		4. Analyse the principles involved in photo excitation of molecules.
		5. Derive the kinetics of photochemical reactions, and explain the applications of radiation chemistry, kinetics of photochemical reactions, solar energy conversion and radiolysis of water.
PECHA20	**ELECTIVE IA: POLYMER CHEMISTRY**	1. Classify polymers and illustrate the types of polymerization techniques.
		2. Illustrate the characterization techniques such as XRD, TGA, DSC, SEM and TEM.
		3. Discuss the polymer reactions and degradation.
		4. Evaluate polymer processing techniques in industries, determine molecular weight of polymers by selected methods such as GPC, osmometry, viscometry, ultracentrifugation and MALDI methods.
		5. Compile the synthesis, properties and applications of polymers and biopolymers.
PECHB20	**ELECTIVE IB: NANO CHEMISTRY**	1. Discuss the basic concepts of nano chemistry including theories of nano chemistry, and to classify the various types of nano systems.
		2. Explain the different methods and techniques of synthesizing nanoparticles.
		3. Discuss the characterization of the nanomaterials.
		4. Explain the applications of nano chemistry in optics, electronics, and sensors.
		5. Outline the biomedical application of nanoparticles.
PICHA20	**IEP - DAIRY CHEMISTRY**	1. Summarize the knowledge on dairy products, processing, and their applications.
		2. Discuss the physical and chemical properties of milk.
		3. Explain the different processing techniques of milk.
		4. Explain marketing of milk and apply skills in detecting adulterants in milk products.
		5. Describe the nutritive value of milk and chemistry of dairy products in bone and muscle formation.
PICHB20	**IEP - QUALITY CONTROL AND CHEMICAL ANALYSIS**	1. Define quality control, quality assurance and describe the necessity of TQM.
		2. Apply standards and specifications in quality control.
		3. Discuss the testing methods involved in quality control of food and textile industries.
		4. Evaluate quality analysis of water, soil, and air.
		5. Demonstrate the basics of good laboratory practices and describe the importance of sampling, documenting and usage of computer aids in QC labs.
PCCHD20	**ORGANIC REACTIONS AND MECHANISMS**	1. Discuss the oxidation of organic compounds using selected oxidizing reagents.
		2. Discuss the reduction of organic compounds using selected reducing reagents.
		3. Describe the mechanisms of various rearrangement reactions and their applications.

		4. Explain the reaction mechanisms and applications of selected named reactions. 5. Illustrate the types of photo chemical reactions, classify pericyclic reactions, and examine the correlation diagram for butadiene-cyclobutene system.
PCCHE20	**ADVANCED COORDINATION CHEMISTRY**	1. Interpret the stability of complexes and explain the applications of various macrocyclic ligands. 2. Explain and analyse the concepts of CFT, MOT and Jahn Teller distortion. 3. Analyse the absorption spectra and determine magnetic susceptibility of metal complexes by different methods. 4. Discuss the electron transfer reaction mechanisms and their importance in biological systems. 5. Explain the reactivity and mechanisms of square planar and octahedral complexes and appraise the applications of complexes in various fields.
PCCHF20	**GROUP THEORY AND QUANTUM CHEMISTRY**	1. Identify symmetry operations and assign point groups of molecules. 2. Construct the character tables for C_{2v} and C_{3v} point groups, apply the concepts of symmetry in molecular vibrations, chemical bonding, and electronic transitions. 3. Identify the limitations of classical mechanics, apply quantum chemistry to solve Schrödinger wave equation for one, two- and three-dimensional boxes and for hydrogen atom and helium ion. 4. Discuss classical and quantum mechanical treatments of one-dimensional harmonic oscillator, calculate the rotational constant and bond length of diatomic molecules. 5. Discuss and apply the approximation methods to single and multi-electron systems, apply the MO theory to di and polyatomic molecules, explain the application of HMO theory to ethylene, butadiene, and benzene.
PECHC20	**ELECTIVE IIA: PHARMACEUTICAL CHEMISTRY**	1. Classify the pharmaceutical drugs and explain the mechanism of drug action and absorption of drugs. 2. Elaborate the biological role of important inorganic compounds and the drugs used in the treatment of mental disorders. 3. Summarize the methods of drug design and development. 4. Review the causes of cancer and its treatment, and to assess the mechanism and the mode of action of anticancer drugs. 5. Formulate the different types of Nutraceuticals and their applications, and to justify the role of anticoagulants in the treatment of blood disorder.
PECHD20	**ELECTIVE II B: MEDICINAL CHEMISTRY**	1. Explain the designing of drugs by different approaches. 2. Define the physiochemical properties of drug molecules, and illustrate pharmacophore, toxicophore, metabophore and interchangeable bioisosteres. 3. Describe the nature of drug receptors and their binding interactions.

		4. Explain the stereochemical properties and biological activity of drug molecules, and to identify the properties of drug molecules by quantum mechanics and molecular mechanics. 5. Describe the physiological and pathological approaches while designing newer drugs for newer diseases, and to Discuss the biological activity of steroids and radioisotopes.
PCCHG20	**PRACTICAL I: ORGANIC CHEMISTRY - I**	1. Identify the components in two component mixture and detect the functional groups. 2. Prepare the organic compounds and purify them. 3. Perform common laboratory techniques like separation, refluxing, recrystallization, vacuum filtration, and sublimation.
PCCHH20	**PRACTICAL II: INORGANIC CHEMISTRY - I**	1. Demonstrate group separation and analysis of inorganic mixtures. 2. Identify rare and common ions present in the inorganic mixtures. 3. Prepare selected inorganic complexes. 4. Estimate the metal ions present in the sample by colorimetric method.
PCCHI20	**PRACTICAL III: PHYSICAL CHEMISTRY - I**	1. Prepare the solutions of different concentrations. 2. Experiment and calculate the rate constant of ester hydrolysis and primary salt effect. 3. Determine the order and energy of activation using kinetics. 4. Construct and analyze phase diagrams, and examine the validity of Freundlich and Langmuir adsorption isotherms. 5. Determine the rate constant using polarimeter and stability constant using photo colorimeter, and develop skills in handling colorimeter and polarimeter.
PICHC20	**IEP - CSIR-NET PREPARATORY COURSE IN INORGANIC CHEMISTRY**	1. Apply and analyze the periodicity of properties of elements, MOT, VSEPR theory, concepts of acids and bases, and the basic aspects of solid-state chemistry. 2. Apply and analyze the properties of main group elements and their compounds. 3. Apply VB, CF and MO theories, and analyze the reactions and properties of complexes. 4. Apply and analyze the chemistry of organometallic and bioinorganic compounds. 5. Apply and analyze the various techniques involved in the characterization of inorganic compounds.
PICHD20	**IEP - WATER CHEMISTRY**	1. Explain the physical and chemical properties of water. 2. Describe the instruments used for water quality monitoring. 3. Examine the physical, chemical and biological pollutants in water. 4. Demonstrate the treatment methods used for recycling of waste water. 5. Explain the policies and laws related to water in Indian constitution.
PCCHJ20	**SYNTHETIC ORGANIC**	1. Analyze and evaluate the concepts of retrosynthesis, disconnection approach and protection of common

	CHEMISTRY	functional groups and apply them in synthesizing target molecules.
		2. Evaluate the methods of asymmetric synthesis and resolution.
		3. Analyze the preparation and uses of selected organic reagents.
		4. Evaluate the role of PTC in organic synthesis.
		5. Appraise the role of transition metals in selected named reactions and plan chemo selective, regioselective and stereoselective named reactions.
PCCHK20	MOLECULAR SPECTROSCOPY	1. Apply Ultraviolet spectroscopy for the identification of organic compounds and inorganic complexes, and to interpret the IR spectra of organic compounds and inorganic complexes.
		2. Discuss the different ionization techniques involved in Mass spectroscopy, principle of GC-MS and its advantages over MS, and to elucidate the molecular formulae and structures of unknown compounds using Mass spectroscopy.
		3. Analyze the splitting pattern in the ^1H, ^{13}C, ^{19}F and ^{31}P NMR spectra for structural determination. Discuss the principle, instrumentation and applications of Mossbauer spectroscopy and analyze the Mossbauer spectra of iron and tin compounds.
		4. Explain hyper fine splitting in EPR and interpret EPR spectra of simple radicals and complexes, and to explain the electronic spectra for chemical analysis.
		5. Elaborate on the concepts and theories of microwave, IR, rotational and vibrational Raman, and electronic spectroscopy.
PCCHL20	ELECTRO CHEMISTRY	1. Examine the concepts and theories of strong electrolytes and verify the Debye Huckle Onsager equation.
		2. Explain the principle and application of various analytical techniques.
		3. Compare the structure of double layers.
		4. Examine and predict the kinetics of electrode reaction of single step and multistep and discuss the theories and mechanism of corrosion and passivation.
		5. Classify the types of fuel cells and ion selective electrodes.
PECHE20	ELECTIVE III A: ANALYTICAL CHEMISTRY	1. Compare different thermal methods of analysis and explain their applications in material science.
		2. Elaborate the principle, instrumentations of the Gas, HPLC and SCF chromatographic techniques and their applications.
		3. Examine the identification of metal ions using AAS and photo acoustic spectroscopy.
		4. Solve simple problems in chemistry using 'C' program.
		5. Analyze the importance of Green Chemistry and its impact on the sustainable environment and the quality of water.
PECHF20	ELECTIVE III B: GREEN	1. Explain the goals and progress of green chemistry.
		2. Summarize the principle of green chemistry and green

	CHEMISTRY	reactions. 3. Discuss the good laboratory practices and designing of green synthesis, and to explain the mechanism and applications of certain named reactions and rearrangements. 4. Explain selected green preparations. 5. Analyze the future trends in green chemistry.
PICHE20	IEP - CSIR-NET PREPARATORY COURSE IN ORGANIC CHEMISTRY	1. Evaluate and apply the theories, concepts, processes, and principles of stereochemistry to qualify UGC-CSIR and other competitive examinations. 2. Appraise the reaction intermediates and named reactions in organic chemistry to qualify UGC-CSIR and other competitive examinations. 3. Examine the organic transformations and asymmetric synthesis to qualify UGC-CSIR and other competitive examinations. 4. Evaluate the pericyclic reactions and applications of heterocyclic compounds to qualify UGC-CSIR and other competitive examinations. 5. Examine the natural product chemistry to qualify UGC-CSIR and other competitive examinations.
PICHF20	IEP - FORENSIC CHEMISTRY	1. Explain the need, scope, and functions of forensic science. 2. Discuss the mode of action and chemical properties of poisons. 3. Explain the isolation, sample preparation and identification of forensic samples. 4. Outline the qualitative and quantitative determination of forensic samples by analytical methods. 5. Demonstrate the process of lie detection and fingerprint detection.
PICHG20	IEP - RESEARCH METHODOLOGY	1. Define research and its objectives, illustrate hypothesis testing, and draw the research plan. 2. Carry out literature search offline and online to fix the research problem and illustrate the importance of IF, SCI, h index and i-index. 3. Apply statistical analysis in research methodology. 4. Describe the general format of thesis writing and the research ethics to be followed. 5. Illustrate the safety measures to be taken in handling toxic, inflammable and explosive chemicals.
PCCHM20	NATURAL PRODUCTS AND BIOORGANIC CHEMISTRY	1. Examine the synthesis and reactions of selected heterocyclic pigments, nucleic acids, vitamins and alkaloids. 2. Evaluate the biosynthesis and metabolism of lipids, cholesterol and hormones. 3. Explain the metabolic pathway of amino acids and proteins and to analyze the structural aspects of proteins. 4. Elaborate the role and metabolism of nucleic acids, genetic code, transcription and translation. 5. Describe the structure and biological role of enzymes (α-chymotrypsin) and cofactors.

PCCHN20	**SOLID STATE CHEMISTRY AND NUCLEAR CHEMISTRY**	1. Sketch the structures of perovskite, CdI, NiAs, spinels, explain electrical, magnetic and optical properties of solids, compare different methods of solid-state reactions and demonstrate selected single crystal growth techniques. 2. Discuss the magnetic properties of nuclides. 3. Describe quark theory and salient features of nuclear models. 4. Illustrate the types of nuclear reactions, explain the applications of radioisotopes in neutron activation analysis, isotope dilution analysis and age determination. 5. Compare the different types of particle detectors, accelerators and explain the knowledge on Nuclear Waste Management.
PCCHO20	**THERMODYNAMICS**	1. Determine the partial molar properties, activity and activity coefficient of non-electrolytes, and standard free energies. 2. Illustrate the relationship between microscopic properties of individual atoms and molecules with macroscopic thermodynamic observables and derive the different types of distribution laws. 3. Derive different forms of molecular partition function, heat capacity of solids and explain law of equipartition of energy. 4. Distinguish the nuclear spin states of hydrogen and deuterium, explain electron gas in metals and blackbody radiation, and apply spectroscopic data for statistical thermodynamics. 5. Explain the concept of non-equilibrium thermodynamics, and derive entropy production in chemical reactions and open systems.
PECHG20	**ELECTIVE IV A: ORGANOMETALLIC AND BIOINORGANIC CHEMISTRY**	1. Explain the preparation, properties, structure and bonding of organometallic complexes and appraise 18 electron rule and EAN rule for metal carbonyls. 2. Explain the mechanism of organometallic reactions, rearrangement reactions of aluminium and tin compounds. 3. Appraise the role of transition metal catalysts in industrial processes. 4. Evaluate the role of oxygen transport, ion transport and electrolytic balance in organisms, and review nitrogen fixation. 5. Elaborate on the biological role of metalloenzymes, and the importance of metals used for diagnosis and treatment of cancer.
PECHH20	**ELECTIVE IVB: ORGANIC FARMING AND SOLID WASTE MANAGEMENT**	1. Elaborate the concept of organic farming. 2. Explain the vision and importance of organic farming movements, apply vermicomposting process and prepare bio-fertilizers. 3. Evaluate the technology to approach the benefits of organic farming. 4. Explain the various aspects of solid waste management. 5. Demonstrate the methods to reduce hazards.

PCCHP20	PRACTICAL IV: ORGANIC CHEMISTRY - II	1. Develop skills to perform two stage preparations of organic compounds and crystallize them. 2. Calculate the saponification value of oil. 3. Estimate the amount of the given organic compound. 4. Demonstrate simple chromatographic techniques. 5. Interpret the structure of organic compounds by analyzing spectral data.
PCCHQ20	PRACTICAL V: INORGANIC CHEMISTRY - II	1. Estimate the amount of metal ions in inorganic mixtures by volumetric and gravimetric methods. 2. Estimate the percentage of metals in ores and alloys by volumetric and gravimetric methods. 3. Prepare selected inorganic complexes. 4. Interpret the spectra of selected inorganic compounds.
PCCHR20	PRACTICAL VI: PHYSICAL CHEMISTRY - II	1. Apply laboratory skills to perform physico-chemical experiments. 2. Demonstrate acid-base, redox and precipitation titrations using conductometry and potentiometry. 3. Determine the pH of buffer solution potentiometrically and verify Ostwald dilution law and Onsager's equation. 4. Interpret the experimental results obtained by conductometric and potentiometric titrations. 5. Describe spectral methods to calculate force constant and interpret UV, IR and NMR spectra.
PICHH20	IEP - CSIR-NET PREPARATORY COURSE IN PHYSICAL CHEMISTRY	1. Apply quantum chemistry to solve Schrödinger wave equation for one, two- and three-dimensional boxes and for hydrogen and helium atoms, apply the approximation methods to single and multi-electron systems, and discuss the concepts of atomic structure, spectroscopy and apply term symbols to many electron systems. 2. Elaborate Huckel theory to conjugated systems, concepts of symmetry in molecular vibrations, chemical bonding and electronic transitions. 3. Compile the concepts of chemical kinetics and enzyme kinetics, describe the concepts of statistical thermodynamics and apply the partition function to model systems. 4. Relate the concepts of electrochemistry, explain the kinetics of reactions in solutions, acid-base catalysis and surface reactions. 5. Illustrate the theory and properties of colloids, mechanism of heterogeneous catalysis and structure of solids, discuss the kinetics of polymerization, and data analysis.
PICHI20	IEP - ADVANCED INSTRUMENTATION TECHNIQUES	1. Outline the working principle of NMR, ESR and Mossbauer spectroscopy with selected applications. 2. Summarize the operating principle, sample preparation and imaging modes of XPS, AES, SEM, TEM, etc. 3. Outline the working principle of separation techniques such as HPLC, NP-HPLC, RP-HPLC, CZE, ICP and hyphenated techniques. 4. Define the principle of voltammetry such as LSV, AWV,

		DPV and theory and applications of Cyclic Voltammetry.
		5. Outline the methods of monitoring air and water pollution.
PICHJ20	**IEP - LEATHER CHEMISTRY**	1. Outline the tanning processes in leather industry.
		2. Discuss the cleaner technology in leather industry.
		3. Illustrate the chrome tanning process.
		4. Outline the mechanism of tanning and role of surface charge and importance of electrostatic, H-bond, dipole-dipole and hydrophobic interactions.
		5. Apply waste water management and zero discharge approaches in leather industry.
M.Sc. COMPUTER SCIENCE	
PCCSA20	**JAVA PROGRAMMING**	1. Understand the basics of Java and AWT
		2. Develop Swing-based GUI
		3. Update and retrieve the data from the databases using JDBC
		4. Develop client/server applications and distributed applications using RMI
		5. Develop server-side programs in the form of Servlets
PCCSB20	**NET FRAMEWORK**	1. Understand code solutions and compile C# projects within the .NET Framework.
		2. Develop C# console applications using Classes and Objects and Interfaces.
		3. Design and Implement database connectivity using ADO.NET in Windows Based Applications.
		4. To understand and be able to using XML in C#.NET specifically ADO.NET and SQL server.
		5. Develop the Web Applications using C#.
PCCSC20	**RESEARCH METHODOLOGY**	1. Understand the concepts of research design, research process and various types of research.
		2. Understand the different steps in writing report.
		3. Implement the methods and techniques for experimental study.
		4. Analyze the ethical issues in research.
		5. Assess the Various research areas in Computer science.
PECSA20	**ELECTIVE I A: DESIGN AND ANALYSIS OF ALGORITHM**	1. Understand data structures and the concepts of algorithm for Merge Sort, Quick Sort and Binary Search.
		2. Understand the fundamental graph algorithms in solving optimization problems.
		3. Update knowledge to learn advanced tree concepts in data structure and algorithm.
		4. Able to perform all the operations on Hashing and Heaps.
		5. Analyze the computational complexity of various algorithms.
PECSB20	**ELECTIVE I B: CYBER SECURITY**	1. Evaluate the computer network and information security needs of an organization.
		2. Assess cyber security risk management policies in order to adequately protect an organization's critical information and assets.
		3. Analyze the performance of applications in a variety of system contexts.

		4. Implement continuous network monitoring and provide real-time security solutions.
		5. Identify physical points of vulnerability in simple networks.
PCCSD20	**PRACTICAL I: JAVA PROGRAMMING LAB**	1. Design and develop GUI applications using Abstract Windowing Toolkit (AWT), Swing and Event Handling.
		2. Update and retrieve the data from the databases using SQL.
		3. Develop Applet based programming using IDE.
		4. Develop server-side programs in the form of servlets.
		5. Design and develop JSP based Web applications.
PCCSE20	**PRACTICAL II: .NET PROGRAMMING LAB**	1. Create user interactive web pages using ASP.NET.
		2. Create simple data binding applications using ADO.NET connectivity.
		3. Performing Database operations for Windows Form and Web Applications.
		4. Create Mobile Application using .NET compact Framework
		5. Work with the basic and advanced features of C# language.
PCCSF20	**MACHINE LEARNING**	1. Understand the basics of Machine Learning.
		2. Explore knowledge about concept learning hypothesis.
		3. Illustrate the working of basic classifier models.
		4. Develop client/server applications and distributed applications using RMI.
		5. Know about parametric methods bias and variance.
PCCSG20	**OPEN SOURCE PROGRAMMING**	1. Learned the need of open source technology, open source development model, application of open sources, aspects of open source movement
		2. Knowledge about the problems with traditional commercial software.
		3. Work with regular expressions, handle exceptions, and validate data.
		4. Familiar with basis syntax of PHP, common PHP scripts elements and creating of the server-side scripting using PHP, implement PHP database connectivity, perform operation on database and open source database management system.
		5. Familiar with basics of LINUX & SHELL Scripting
PCCSH20	**WIRELESS COMMUNICATION AND NETWORKS**	1. To design the various wireless networks.
		2. Understand the principles behind the networking operation.
		3. Examine the services provided in various layers of networks.
		4. Classify different technologies followed in various generation of cellular networks.
		5. Analyze different types of networks in wireless technology.
PCCSI20	**THEORY OF COMPUTATION**	1. Understand and conduct mathematical proofs for computation and algorithms.
		2. Show a competent understanding of the basic concepts of graph theory.
		3. Explain the models of computation, including formal languages, grammars and automata.
		4. Recognize and comprehend formal reasoning about

| | | languages. |
		5. Expand knowledge of pushdown automata and Turing machines.
PECSC20	**ELECTIVE II A: CRYPTOGRAPHY AND NETWORK SECURITY**	1. Apply the knowledge of cryptographic checksums and evaluate the performance of different message digest algorithms for verifying the integrity of varying message sizes.
		2. Understand network security basics, analyze different attacks on networks and evaluate the performance of firewalls and security protocols like SSL, IPSec, and PGP.
		3. Analyze and apply system security concept to recognize malicious code.
		4. Able to do research in the emerging areas of cryptography and network security.
		5. Protect any network from the threats in the world.
PECSD20	**ELECTIVE II B: SOFT COMPUTING**	1. Describe Soft Computing Techniques and their roles in building Intelligent Machines
		2. Analyze various fuzzy models in developing fuzzy inference system to be appropriate with specific real time problems.
		3. Apply Specific Unsupervised and Supervised Neural Network to find the approximate solutions to real world Problems.
		4. Use genetic algorithm to combinatorial Optimization Problems.
		5. Present the feasibility of applying a Soft Computing methodology for specific problem.
PCCSJ20	**PRACTICAL III: MACHINE LEARNING**	1. Be capable of confidently applying common Machine Learning algorithms in practice and Implementing their own.
		2. Be capable of performing distributed computations.
		3. To be capable of performing experiments in Machine Learning using sample data.
		4. Understand a wide variety of learning algorithms.
		5. Understand how to evaluate models generated from data
PCCSK20	**PRACTICAL IV- OPEN SOURCE PROGRAMMING LAB**	1. Explore different open source technology like Linux, PHP & MySQL with different packages.
		2. Implement static, dynamic and interactive web pages and web applications.
		3. Develop basic skills in analyzing the usability of a web site.
		4. Execute programs of PHP with MySQL connection.
		5. Execute Linux commands for programming.
PCCSL20	**WEB SERVICES**	1. Efficiently use market leading environment tools to create and consume web services.
		2. Identify and select the appropriate framework components in creation of web service solution.
		3. Able to apply SOAP, HTTP and UDDI services in the web applications.
		4. Apply SOAP principles to creation of web service solutions.
		5. Able to know the structure of XML and to design and store

		data in XML.
PCCSM20	**DISTRIBUTRED AND CLOUD COMPUTING**	1. Understand the concepts of cloud Architecture and its services. 2. Classify different services providers and its services, tools. 3. Demonstrate the paradigms and to map applications. 4. Analyze the best resource for cloud computing. 5. Assess virtualization in cloud.
PCCSN20	**PRINCIPALS OF COMPILER DESIGN**	1. Explain the concepts of compiler and discuss the Code Generation 2. Describe the functionality of Lexical analysis. 3. Describe the functionality of Syntax analysis. 4. Define the storage organization and List the intermediate codes. 5. Summarize the working features of Code Generation. 6. Apply their basic knowledge of Data Structure to design Symbol Table, Lexical Analyzer, Intermediate Code Generation, and Parser.
PECSE20	**ELECTIVE III A: INTERNET OF THINGS**	1. Understand the fundamentals of IoT. 2. Analyze different connectivity technologies for IoT. 3. Design a portable IoT using Arduino / equivalent boards and relevant protocols. 4. Deploy an IoT application and connect to the Fog. 5. Develop IoT applications with different platform and frameworks.
PECSF20	**ELECTIVE III B: MULTIMEDIA COMMUNICATION**	1. Understand the current state-of-the-art developments in Internet technologies for multimedia communications 2. Understand and apply the principles used in designing multimedia protocols, and standard protocols that are designed the way that they are. 3. Understand the system design principles of multimedia communications systems. 4. Solve problems and design simple networked multimedia systems 5. Think critically and learn independently.
PECSG20	**ELECTIVE IV A: BIG DATA ANALYTICS**	1. Define the big data, types of data and understand the need of big data analytics. 2. Describe the Hadoop architecture and File system. 3. Apply the MapReduce Programming model for real-world problems. 4. Learn the concepts of Main data streams. 5. Demonstrate the working of clusters.
PECSH20	**ELECTIVE IV B: SOFTWARE PROJECT MANAGEMENT**	1. Estimate project cost and perform cost - benefit evaluation. 2. Projects perform project scheduling, activity network analysis and risk management 3. Apply schedule and cost control techniques for project monitoring including contract management. 4. Apply quality models in software projects for maintaining software quality and reliability. 5. Use suitable project organization structure, leadership,

		decision and motivation styles, proper safety and ethical practices and be responsible to the society.
PCCSO20	**PRACTICAL V: WEB SERVICES LAB**	1. Understand, analyze and evaluate a system using web services. 2. Identify and formulate and solve web related problems. 3. Use techniques and skills to design web based applications. 4. Understand and describe Java - enabled XML technology. 5. Be able to create, deploy, and call Web services using Java, .NET
PICSA20	**SOFTWARE QUALITY ASSURANCE**	1. Test the software by applying various testing techniques. 2. Able to debug the project and to test the entire computer-based systems at all levels. 3. Test the applications in the specialized environment using various automation tools. 4. To evaluate the applications using software testing tools. 5. Apply quality and reliability metrics to ensure the performance of the software.
PICSB20	**GREEN COMPUTING**	1. Understand the Concept of Green IT. 2. Discuss Green IT in relation to technology. 3. Evaluate IT use in relation to environmental perspectives. 4. Discuss the methods and tools to measure energy consumption. 5. Conclude with a Green IT to sustainable development and develop energy saving.
PICSC20	**DISTRIBUTED OPERATING SYSTEM**	1. Understand the architecture of distributed operating system. 2. Differentiate between centralized and distributed system. 3. Determine the difficulties of distributed memory management. 4. Analyze effective synchronization techniques to be performed to run a task in a distributed system. 5. Evaluate the best methods to follow to execute a task in remote machines.
PICSD20	**WIRELESS SENSOR NETWORKS**	1. Understand the concepts of Wireless Technology and supporting Protocols. 2. Understand the Basic Sensor Systems and provide a survey of Sensor Technology. 3. Understand the Medium Access Control protocols and analyze various Routing Protocols at Network Layer. 4. Learn Transport Control Protocols for Sensor Networks Middleware and design requirements. 5. Understand the Sensor Management, Sensor Networks, and Operating System.
PICSE20	**DIGITAL IMAGE PROCESSING**	1. Understand the basics of Graphics 2. Understand the fundamentals and applications of digital image processing and be aware about intensity transformations. 3. Explore knowledge about image processing fundamentals. 4. Know about various noise models and transformation techniques.

		5. Able to know the structure of XML and to design and store data in XML
PICSF20	**STEGANOGRAPHY AND DIGITAL WATERMARKING**	1. Discuss the need for watermarking and steganography 2. Distinguish between watermarking and steganography 3. Elaborate on the various models of watermarking and steganography. 4. Point out various steganalysis algorithms. 5. Show how watermarking and steganography can be applied to various applications and evaluate them.
PICSG20	**CLOUD SOLUTION WITH AZURE**	1. Understand the basics of Cloud Computing with Azure and its services. 2. Implement the services of Azure. 3. Learn various solutions in Azure. 4. To develop application based Azure Solutions. 5. Develop and deploy applications in Azure.
PICSH20	**INTRODUCTION TO BLOCK CHAIN TECHNOLOGY**	1. Understand design principles of Bitcoin and Ethereum. 2. Learn the Simplified Payment Verification protocol. 3. Describe and understand the differences between the most prominent block chain structures and permissioned block chain service providers. 4. Understand the crypto currency mechanism by sending and reading transactions. 5. Evaluate security, privacy, and efficiency of a given block chain system in various applications
PICSI20	**EMBEDDED SYSTEM**	1. Understand the Concepts of Embedded Systems. 2. Recognize the concepts of Network devices. 3. Gain the knowledge of Device Drivers and Interrupts Servicing Mechanism. 4. Acquire the knowledge of Real Time Operating Systems. 5. Understand Program Modeling Concepts.
M.Sc ELECTRONIC MEDIA	
PCEMA20	**MASS COMMUNICATION AND JOURNALISM**	1. Review the Basics of Communication and Mass Culture. 2. Analyze and Understand the Western Models and Theories of Communication. 3. Acquiring Knowledge about the inception of Journalism. 4. Analyse the Journalistic Values and Various News Paper Organizations. 5. Evaluate the Concept of Journalistic Writing and Editing.
PCEMB20	**BROADCASTING IN INDIA**	1. Identify the Inception of Radio and Development of Radio in India. 2. Analyze the Evaluation of Television and its Development Process in India 3. Evaluate the Various formats and genres of Radio. 4. Compile the Various formats and genres of Television. 5. Examine the Broadcast Regulations and Convergence of Media.
PCEMC20	**VIDEOGRAPHY**	1. Describe the Basic Parts and Functions of the Video camera. 2. Analyze the Characteristic of Lighting and Lighting

		techniques.
		3. Acquiring Knowledge in Camera Composition Techniques and concepts of Color.
		4. Evaluate the Camera Operation and Lighting Techniques in Indoor Production.
		5. Elaborate Various Recording and Storage Formats of Videos.
PCEMD20	PRACTICAL – I: VIDEO PRODUCTION	1. Classify the various parts and function of the video camera.
		2. Acquiring and applying knowledge in shots, angles and camera movements.
		3. Applying the lighting and composition techniques.
		4. Examine the montage recording techniques.
		5. Creating the short film using proper camera technique.
PCEME20	PRACTICAL – II: WRITING FOR BROADCAST MEDIA	1. Explain the basic writing skills for Broadcast Media.
		2. Creating the Advertisement, promo and PSA for Radio.
		3. Creating the Advertisement, PSA for Television medium.
		4. Design the Drama for the radio medium
		5. Compile News Releases for the radio and Television medium.
PEEMA20	ELECTIVE – I A: SCRIPT WRITING AND DIRECTION	1. Restate the basics of script and script writing process.
		2. Analysing the various scripts formats for fiction and nonfiction programs.
		3. Evaluating the role of director from preproduction to post production.
		4. Acquiring in depth knowledge about the production stage and its related activities.
		5. Analysing the various methods and techniques in direction.
PEEMB20	ELECTIVE – I B: BROADCAST JOURNALISM	1. Discussing the basic concepts of Journalism.
		2. Analysing the ethical codes and ethical standards of journalism in the contemporary media.
		3. Acquiring in depth knowledge in television news process.
		4. Adapting the techniques of news writing process for a radio medium.
		5. Evaluating the legal aspects and procedures of launching the Broadcast news channel.
PCEMF20	ADVANCED TELEVISION PRODUCTION	1. Describing the basics of Television production and its standard formats.
		2. Acquiring the knowledge on Production management and production elements.
		3. Examine the basic work process in the preproduction stage.
		4. Analysing the production process and production techniques.
		5. Adopting the post production process and its techniques
PCEMG20	RADIO PRODUCTION	1. Review the basic sound principles and psychophysics of sound.
		2. Evaluating the uses of sound equipment's and production of multichannel sounds.
		3. Acquiring the knowledge on Acoustical requirement of ideal studio.

		4. Analysing on the types of special audience programming on radio
		5. Examine the innovative developments in radio communication.
PCEMH20	**MEDIA ANALYSIS AND TECHNIQUES**	1. Explain the Semiotic Analysis of Media.
		2. Acquiring Knowledge about Marxist Analysis
		3. Analysing the Psychoanalytic Criticism
		4. Evaluating the Feminist Analysis.
		5. Examine the Concept of Media Ethics and Laws.
PCEMI20	**PRACTICAL III: NON LINEAR EDITING**	1. Identify the Final Cut Pro Tools and Techniques.
		2. Acquiring Knowledge about the Radio Programming.
		3. Elaborating the Key features of News Production.
		4. Creating the titling and end credits and Dubbing for Video Production.
		5. Develop the various formats of Programme Production.
PCEMJ20	**PRACTICAL IV: PROJECT WORK**	1. Analysing the Concepts of Documentary/Short film production
		2. Implementing the Pre-Production process of Documentary/short film
		3. Executing the Production process of Documentary/short film
		4. Compile the Post Production Activities according to the Script.
		5. Creating the Documentation with Master Copy.
PEEMC20	**ELECTIVE II A: INTER-CULTURAL COMMUNICATION**	1. Discuss the Concept of Inter Culture Communication.
		2. Acquiring Knowledge in the aspects of inter cultural Business Communication.
		3. Analysing the Concepts of Intra Cultural Communication.
		4. Acquiring the Knowledge about Global Communication
		5. Evaluating the Relationship Between Intercultural Communications in News Media Production.
PEEMD20	**ELECTIVE II B: MOBILE COMMUNICATION**	1. Explain the concepts of Wireless communication.
		2. Analysing the work process of Analog and digital signal transmission.
		3. Explain the components of radio system and radio frequency.
		4. Evaluating the various kinds of wireless network and its uses.
		5. Analysing the advantages and challenges of wireless communication.
PCEMK20	**FILM STUDIES**	1. Classify the inception of world cinema and history of Indian cinema.
		2. Analysing the concept of film as an art and characteristics of films.
		3. Acquiring the knowledge on various concepts of film theories.
		4. Making an in-depth analysis on Genres of cinema.
		5. Elaborate the recent trends in film industry.
PCEML20	**COMMUNICATION**	1. Explain the basic concepts of research and research process.

	RESEARCH METHODS	2. Assessing the concepts of qualitative and quantitative research. 3. Making an in-depth analysis on sampling methods and sampling techniques. 4. Analysing the various statistics methods and Analysis. 5. Acquiring the knowledge on research report writing and presentation.
PCEMM20	**PUBLIC RELATIONS AND CORPORATE COMMUNICATION**	1. Review the concepts of public relations and different models of PR. 2. Evaluating the functions of PR and PR Writing. 3. Analysing the role of PR in press and other media relations. 4. Acquiring the knowledge on corporate communication. 5. Elaborate the PR profession and PR in the digital Era.
PCEMN20	**PRACTICAL – V: INTERNSHIP**	1. Discuss the concepts of production house in Television Medium. 2. Acquiring an in-depth knowledge in the Respective Media Industry. 3. Compiling the Types of Work done in the Production house. 4. Evaluating the Experience gained in Production house. 5. Substantiate the Report with proper documents.
PCEMO20	**PRACTICAL – VI: BASIC 3D GRAPHICS AND ANIMATION**	1. Locating the Various tools and workspace of 3D Studio Max. 2. Acquiring the knowledge in basic Animation Techniques. 3. Analyze and usage of Character Animation Techniques. 4. Creating a Product and Architecture Design. 5. Compile the Concept of Lighting and Camera effect in 3d Animation.
PEEME20	**ELECTIVE III A: TECHNICAL BUSINESS COMMUNICATION**	1. Describe the concepts of Business communication. 2. Analysing the theories of organizational group communication. 3. Assessing the importance of business correspondence and the writing skills. 4. Applying and presenting the visual aids in oral presentation. 5. Evaluating the ethics and business communication in the global context.
PEEMF20	**ELECTIVE IV B: ADVERTISING IN VISUAL MEDIA**	1. Identify the basic purpose and functions of Advertising. 2. Analysing the economic and social issues in advertising. 3. Elaborating about Advertising in marketing mix and process. 4. Acquiring the knowledge on advertising strategy planning. 5. Making and presenting of print and radio Ads.
PCEMP20	**ELECTRONIC MEDIA MANAGEMENT**	1. Explain the basic responsibilities of media and journalism. 2. Analysing theories and modern approaches to Management. 3. Acquiring the knowledge about Human Resources Management. 4. Evaluating the Marketing strategies of Media Management. 5. Formulating the Programme budget process of Television and radio
PCEMQ20	**DEVELOPMENT**	1. Review the various approaches for Development

	COMMUNICATION	communication.
		2. Analysing the Development communication in the global perspectives.
		3. Acquiring the knowledge about the key concepts in development communication.
		4. Assessing the policies of government on development perspectives.
		5. Evaluating the role communication and empowerment strategies for development communication.
PCEMR20	**ADVERTISING &INTERGRATED MARKETING COMMUNICATION**	1. Discuss the inception of advertising and its benefits.
		2. Analysing the Branding and market segmentation of advertisement.
		3. Examining the advertising agencies and Elements of Ad layout.
		4. Compiling the concepts of integrated marketing communication.
		5. Evaluating the concepts of Corporate advertising.
PCEMS20	**PRACTICAL – VII: RESEARCH PROJECT**	1. Describe the Basic concepts of Qualitative and Quantitative Research Methods.
		2. Analysing the topic and choosing the topic related to their rate of interest.
		3. Evaluating the Research and choosing the desired methodology for conducting research.
		4. Compiling the data collected and pointing the Key findings.
		5. Constructing the desired conclusion and writing the Research Report.
PCEMT20	**PRACTICAL – VIII: WEB PUBLISHING**	1. Acquiring the Basic Knowledge about Adobe Dreamweaver.
		2. Locating the Various Tags used for Creating web pages.
		3. Designing the Navigation Structure for Web Pages.
		4. Creating the Web pages and Making Links.
		5. Compose Various Effects and transitions to Web pages.
PEEMG20	**ELECTIVE IV A: WEB DESIGNING**	1. Review the concepts of web Design and Web browsers.
		2. Acquiring knowledge about Dreamweaver and making Hyperlinks.
		3. Analysing the HTML Tags and its Attributes.
		4. Evaluating the Concept for planning the Website.
		5. Constructing the Webpages by using Cascading Style sheet and preview it in Browsers.
PEEMH20	**ELECTIVE IV B: WOMEN AND MEDIA**	1. Discuss the Concept of Portrayal of women in Media.
		2. Analysing the concept of Media for Development.
		3. Examining the portrayal of women in Media
		4. Acquiring Knowledge about Development of women in Media.
		5. Evaluating the role of Women in Media.
PIEMA20	**INDEPENDENT ELEC INDEPENDENT ELECTIVE-RADIO & TELEVISION**	1. Identify the basic radio production fundamentals and radio programming formats
		2. Analysing the structure of news story and its presentation methods
		3. Evaluating the components of television news and the role

	NEWSCASTING TIVE-RADIO & TELEVISION NEWSCASTING	of Media professionals 4. Acquiring the knowledge about requirements for news production 5. Elaborating the role of news production teams and risk management in news casting
PIEMB20	INDEPENDENT ELECTIVE- ELECTRONIC JOURNALISM	1. Indicating the origin and development of electronic journalism 2. Analysing the concept of radio news production and its genres 3. Applying the concept of television news production techniques and live news 4. Elaborating the features and development of online journalism 5. Compiling the technologies used for electronic journalism
PIEMC20	INDEPENDENT ELCTIVE -WOMEN AND ADVERTISING	1. Describing the role of women in Advertising 2. Analysing the portrayal of women in advertising 3. Evaluating the ethical codes of advertising 4. Exploring on the women entrepreneurship in India 5. Compiling the notable emerging women leaders in Advertising
PIEMD20	INDEPENDENT ELECTIVE- INTERNATIONAL COMMUNICATION	1. Explain the concept of international communication and balanced information flow 2. Analysing the approaches and theories related to international communication 3. Exploring about the international media organization 4. Evaluating the concept of disappearing borders of empowerment 5. Identifying the key figures of international communication
M.Sc. MATHEMATICS		
PCMAA20	MODERN ALGEBRA	1. Assess the properties of Groups and Sylow's theorem. 2. Apply field extension property in Algebraic extensions. 3. Get the knowledge of Transcendence e and roots of polynomial. 4. Know about the Galois Theory. 5. Have the knowledge on the concepts of solvability by radicals.
PCMAB20	REAL ANALYSIS - I	1. Understand n-dimensional space R^n and the metric space whose topology is uniquely determined by the algebraic structure. 2. Deal with the functions of bounded variations and some of their properties. 3. Know about the Riemann-Stieltjes integral and its properties which is a generalization of the Riemann integral. 4. Recognize the necessary and sufficient conditions for the existence of the R-S integral. 5. Grasp the class of Lebesgue integrable functions which is defined in terms of upper and lower bounds using the Lebesgue measure of a set.
PCMAC20	COMPLEX	1. Understand the elementary theory of power series and

	ANALYSIS	conformality to perform the linear transformation. 2. Solve the integration in the complex plane by using the fundamental theorems. 3. Be familiar with Cauchy's Integral Formula and the properties of analytical functions. 4. Determine the local mapping and learn the general form of Cauchy's theorem. 5. Deal with the concept of Calculus of Residues and Harmonic Functions.
PCMAD20	DIFFERENTIAL EQUATIONS	1. Understand ordinary differential equations of various type, their solutions, and fundamental concepts about their existence. 2. Obtain solutions of the Homogeneous equation with constant coefficient and Homogeneous equation with analytic coefficient. 3. Comprehend the Bessel functions, Legendre equation, Legendre polynomials and Regular singular points. 4. Know Picard's method of obtaining successive approximations of solutions of first order differential equations. 5. Understand Eigen values and Eigen functions of Strum-Liovuille systems, and obtain the solutions of initial and boundary value problems.
PEMAA20	ELECTIVE I A: DIFFERENTIAL GEOMETRY	1. Understand the line integrals, deal with differential forms and calculate arc length, curvature of surfaces. 2. Analyze involutes, evolutes and fundamental existence theorem for space curves. 3. Apply problem solving with differential geometry to diverse situations in physics, engineering and in other mathematical contexts. 4. Evaluate the fundamental forms of a surface. 5. Compute the Gaussian curvature, the mean curvature, the curvature lines and the asymptotic lines.
PEMAB20	ELECTIVE I B: MATHEMATICAL MODELLING	1. Understand the mathematical basis of common algorithms, and the ability to calculate accurately and efficiently. 2. Demonstrate the use of mathematical reasoning by justifying and generalizing patterns and relationships between the variables in the mathematical models. 3. Formulate and qualitatively analyze mathematical models of a wide range of systems and processes. 4. Recognize the types of Mathematical models and the complexity in each system. 5. Recognize the power of mathematical modelling and analysis and be able to apply their understanding to their further studies.
PIMAA20	INDEPENDENT ELECTIVE 1 A: FUNDAMENTALS OF GROUP	1. Understand the importance of various types of Groups. 2. Extend the knowledge in some important groups (Homomorphism and Isomorphism) 3. Understand the concepts of fundamentals of finite abelian

	THEORY	4. Acquire benefits of Sylow's theorem and classify the Class equations. 5. Solve various objective type problems using simple concepts.
PIMAB20	**INDEPENDENT ELECTIVE 1 B: QUANTITATIVE APTITUDE FOR COMPETITIVE EXAMINATIONS I**	1. Understand the concepts of Number System and aptitude problems. 2. Recollect the formulae and solve problems on profit and loss, Interest and Time and Work. 3. Demonstrate basic understanding on data interpretation and exhibit eloquence in verbal reasoning. 4. Identify and respond effectively to questions on clerical ability. 5. Recognize the type of questions and answer them confidently with efficiency in grammar.
PCMAE20	**PCMAE20 – LINEAR ALGEBRA**	1. Have knowledge on Modules and Canonical form. 2. Analyze Jordan and Rational canonical form. 3. Understand the concepts of linear transformation and apply it on linear operators. 4. Understand the concepts of finite division ring. 5. Know about division rings having the field in their centers.
PCMAF20	**REAL ANALYSIS- II**	1. Understand the theory of double sequences and double series which is an extension of the single or ordinary sequences and series and identify the convergence and divergence of infinite product. 2. Determine the properties of the Fourier coefficient and solve the problem for the orthonormal system of functions. 3. Identify the Convergence of a sequence and series of functions. 4. Link the multiplication of power series, reciprocal of power series, and real power series. 5. Deal with the concepts of Directional derivative, Total derivative, Chain rule, Inverse function, and Implicit function theorems.
PCMAG20	**PARTIAL DIFFERENTIAL EQUATIONS AND INTEGRAL PARTIAL DIFFERENTIAL EQUATIONS**	1. Apply specific methodologies, techniques and resources to conduct research and produce innovative results. 2. Solve problems of heat conduction equation by using initial and boundary conditions. 3. Use the knowledge of PDEs, to solve one dimensional wave equation by canonical equation. 4. Solve practical PDE and integral PDE problems with finite difference methods. 5. Develop mathematical skills to solve problems involving convolutions.
PCMAH20	**MECHANICS**	1. Define and understand basic mechanical concepts related to discrete and continuous mechanical systems. 2. Describe and understand the motion of a mechanical system using Lagrange's equation. 3. Use Euler-Lagrange equation to find stationary paths and

		understanding the theory of variational principles.
		4. Acquire knowledge on Hamilton's principle and Hamilton's equation.
		5. Study the concepts of canonical transformations and solve the transformations by using Lagrange and Poisson brackets.
PEMAC20	**ELECTIVE II A: LaTeX and MATLAB**	1. Understand the mathematical basis of common algorithms in Latex.
		2. Demonstrate the use of mathematical equations, tables and figures in Latex.
		3. Demonstrate understanding and use of MATLAB software
		4. Construct one dimensional array, two dimensional arrays and basic functions in MATLAB.
		5. Recognize the power of mathematical modelling and analysis using MATLAB and be able to apply their understanding to their further studies.
PEMAD20	**ELECTIVE II B: FLUID DYNAMICS**	1. Understand the concepts of fluid flow
		2. Identify pressure of fluid in different kind of Motion
		3. Analyse the topics of Axi-Symmetric Flows, Stoke's Stream Function
		4. Determine the Stream Function, the Complex Potential for Two-Dimensional, Irrotational, Incompressible Flow.
		5. Explain the concepts the Rate of Strain Quadric and Principal Stresses, Stress Analysis in Fluid Motion, the Coefficient of Viscosity and Laminar Flow, the Navier-Stokes Equations of Motion of a Viscous Fluid.
PIMAC20	**INDEPENDENT ELECTIVE 2 A: FUNDAMENTALS OF RING THEORY**	1. Demonstrate various characteristic of Rings.
		2. Extend the knowledge in Ideals, Fields of Quotients and polynomial rings.
		3. Validate primitive polynomials and Irreducible Polynomials.
		4. Acquire the knowledge in Field theory.
		5. Solve various types of problems in finite fields.
PIMAD20	**INDEPENDENT ELECTIVE 2 B: QUANTITATIVE APTITUDE FOR COMPETITIVE EXAMINATIONS II**	1. Understand and solve aptitude problems.
		2. Identify and develop the techniques to solve the problems using different methods.
		3. Demonstrate procedural fluency with real number arithmetic operations and use those operations to represent real-world scenarios and to solve stated problems.
		4. Solve linear equations, graph and interpret linear models, and read and apply formulas.
		5. Ability to face the competitive examinations with a clear approach.
PCMAI20	**PCMAI20 - TOPOLOGY**	1. Understand basis as a collection of basic open sets and the concepts of continuous functions and their properties in topological spaces.
		2. Determine the topology generated by the given basis, connectedness, path connectedness of the product of an arbitrary family of spaces.
		3. Grasp the concept of compactness which is the generalization to topological spaces of the property of

		closed and bounded subsets of the real line. 4. Deal with the countability and separation axioms 5. Know the theorems with the conditions under which a topological space can be embedded in metric space.
PCMAJ20	**NUMERICAL ANALYSIS**	1. Find the solution in Numerical, Algebraic and transcendental equations. 2. Solve the set of algebraic equations by direct and iterative methods. 3. Analyze the values of a function for any intermediate value of the independent variable. 4. Compute the numerical solution of various types of ordinary differential equations. 5. Acquire the numerical solution of Partial Differential Equations.
PCMAK20	**PROBABILITY THEORY**	1. Characterize probability models and function of random variables based on single and multiple random variables. 2. Evaluate and apply expected value, moments and understand the concept of Chebyshev inequality. 3. Analyze the concepts of characteristic functions and its properties. 4. Apply probability distribution to solve the real world problems. 5. Understand the concept of limit theorem and its applications.
PCMAL20	**OPERATIONS RESEARCH**	1. Determine the feasible solution using Revised simplex method, Duality and bounded variable algorithm. 2. Understand the theoretical background of queuing systems and solve the real world problems. 3. Analyze the Inventory models and solve EOQ models. 4. Apply dynamic programming to solve real world problems. 5. Solve constrained and unconstrained optimization problems using Hookes and Jeeves algorithm, Gradient projection, Lagrange multipliers, Kuhn-Tucker conditions etc.
PEMAE20	**ELECTIVE III A: PROGRAMMING WITH JAVA**	1. Understand the benefits and applications of OOP and distinguish C++ and JAVA. 2. Gain knowledge about operators and its types. 3. Define decision making statements and solve problems based on it. 4. Develop the program by manipulating classes and methods in the Java programming language. 5. Explore the Java programming by using arrays.
PEMAG20	**ELECTIVE III B: PROGRAMMING WITH R**	1. Familiarize with basics of R software and built in function of R. 2. Identify the characteristics of datasets and plot the datasets in R using graphical methods. 3. Demonstrate understanding and use of for loop, if statement and break. 4. Implement the learning techniques and computing environment that are suitable for the applications under

		consideration.
		5. Compute vectors and matrices, matrix inverse, eigen values and eigen vectors.
PEMAF20	**ELECTIVE PRACTICAL: JAVA**	1. Implement programs with classes. 2. Write programs that perform operations using arrays. 3. Develop the program by decision making statements and solve problems based on it. 4. Illustrate basic programming concepts such as program flow and syntax of a high-level general purpose language. 5. Take a problem, figure out the algorithm to solve it and write the code.
PEMAH20	**ELECTIVE PRACTICAL: R**	1. Familiarize with basics of R software and built in function of R. 2. Identify the characteristics of datasets and plot the datasets in R using graphical methods. 3. Demonstrate understanding and use data frames. 4. Implement the learning techniques and computing environment that are suitable for the applications under consideration. 5. Compute vectors and matrices, matrix inverse, eigen values and eigen vectors.
PIMAE20	**INDEPENDENT ELECTIVE 3 A: SKILL ENHANCEMENT IN REAL AND COMPLEX ANALYSIS -I**	1. Utilize the basics of set theory and number system. 2. Acquire the knowledge of Sequences and Series. 3. Compute the Limit, Continuity and Differentiation of functions. 4. Analyze the Transcendental functions such as Exponential, Trigonometric and Hyperbolic Functions. 5. Evaluate the integral by Cauchy's Integral formula.
PIMAF20	**INDEPENDENT ELECTIVE 3 B: FUNDAMENTALS OF RESEARCH METHODOLOGY AND STATISTICS - I**	1. Utilize the basic concepts of Research. 2. Prepare the review of literature. 3. Plan the various types of survey studies and sampling design. 4. Study the case of Historical methods and Philosophical methods. 5. Classify the experimental procedure and case study of various groups.
PCMAM20	**FUNCTIONAL ANALYSIS**	1. Gain the knowledge of complete normed linear space and the Hahn Banach theorem. 2. Understand the open mapping theorem, closed graph theorem, and uniform boundedness theorem and determine the concept of complete inner product space and its properties. 3. Classify the operators into adjoint, self-adjoint, unitary and normal. 4. Know the basic properties of Banach Algebra and the spectrum of an element in a Banach algebra. 5. Represent commutative Banach algebras as algebras of continuous functions.
PCMAN20	**CALCULUS OF**	1. Understand the functional and its applications. Also use the

	VARIATIONS	Euler-Lagrange equation to find the differential equations for stationary paths.
		2. Describe Du Bois-Reymond problem and solve it.
		3. Solve differential equations for stationary paths subject to boundary conditions
		4. Give an account of the foundations of calculus of variations and its applications in Mathematics and Physics.
		5. Apply direct methods to solve variational problems.
PCMAO20	MATHEMATICAL STATISTICS	1. Understand the sample moments and their functions and analyze chi-square, Student-t, Fishers-Z distributions.
		2. Demonstrate the knowledge of the properties of parametric testing procedures.
		3. Construct tests and estimators, and derive their properties. Estimate population parameters from data sets and use the sampling distributions to compute confidence intervals for these population parameters.
		4. Learn the basic components of hypothesis testing and perform hypothesis test on population means.
		5. Understand the basic terms used in design of experiments and use appropriate experimental designs to analyze the experimental data.
PCMAP20	PROJECT	
PEMAI20	ELECTIVE IV A: GRAPH THEORY	1. Identify subgraphs, cycles, paths and connection in graphs.
		2. Analyse the cut vertices, cut edges and bonds in trees.
		3. Distinguish between the Hamiltonian and Eulerian graph.
		4. Explain the concepts of matchings and coverings in bipartite graphs.
		5. Understand the concepts of colouring and planar graphs.
PEMAJ20	ELECTIVE IV B: FUZZY SET THEORY	1. Distinguish between crisp set and fuzzy set through bi-valued logic and infinite-valued logic.
		2. Know about the most widely used standard fuzzy set operations.
		3. Formulate the fuzzy number which is a special case of a convex, normalized fuzzy set of the real line.
		4. Explore the fuzzy relation and its operations which is the generalization of crisp relation.
		5. Analyze the methods of decision making in fuzzy environment and their applications in LPP.
PIMAG20	INDEPENDENT ELECTIVE 4 A: SKILL ENHANCEMENT IN REAL AND COMPLEX ANALYSIS – II	1. Analyze the theory of Partial derivatives.
		2. Compute Riemann Sum and Riemann integral.
		3. Evaluate the concepts of Lebesgue measure and Lebesgue integral.
		4. Identify the Connectedness and Compactness.
		5. Calculate the Residues of functions and improve the knowledge of conformal mappings.
PIMAH20	INDEPENDENT ELECTIVE 4 B: FUNDAMENTALS OF RESEARCH	1. Analyze the needs and purpose of Experimental design.
		2. Prepare and Analyze the Questionnaire and compute the Statistical analysis of data.
		3. Analyze the statistical data and research report.

	METHODOLOGY AND STATISTICS – II	4. Acquire the knowledge of Action research and Educational research. 5. Understand the basic measures of variability, dispersion and correlation.
PCBAD20	**STATISTICAL METHODS FOR RESEARCH** <mark>**FOR MBA**</mark>	1. Understand the basic concepts in statistics. 2. Solve different statistical concepts related to management. 3. Acquire wide knowledge of different statistical analysis. 4. Understand and apply different ethics in business research. 5. Get a basic knowledge about data collection and report writing.
PCBAK20	**RESOURCE MANAGEMENT TECHNIQUES** <mark>**FOR MBA**</mark>	1. Understand the basic Operation Research concepts related to management. 2. Analyse the real life situation using Transportation and Assignment problems. 3. Acquire wide knowledge in Game Theory and replacement models that are used in management. 4. Solve any practical issues using Queuing Theory and decision making. 5. Impart the knowledge in Network Analysis that are used in Management.
	<mark>**M.Sc. PHYSICS**</mark>	
PCPHA20	**MATHEMATICAL PHYSICS – I**	1. Understand and apply the basic concepts of vectors and vector space. 2. Perceive various types of matrices, solve Eigen value problems and carry out matrix operations. 3. Solve ordinary differential equations that are common in the physical-sciences. 4. Understand the characteristics of special functions to solve the physical problems. 5. Understand and use Dirac-delta function for describing physical systems and apply Green's function to solve partial differential equations.
PCPHB20	**CLASSICAL MECHANICS**	1. Acquire knowledge about the fundamental concepts of dynamics of system of particles 2. Use D'Alembert's principle and calculus of variations to derive the Lagrange - Hamilton formalism applicable to solve the equation of motion for any mechanical system 3. Understand the essential features of canonical transformations and their applications to various systems. 4. Describe the Hamilton-Jacobi equation and develop the skills to use them to set and solve the appropriate physical problems. 5. Gain knowledge about the fundamental principles of small theory of oscillations and its applications.
PCPHC20	**STATISTICAL MECHANICS**	1. Define and discuss the concepts in thermodynamics and statistical mechanics. 2. Differentiate classical and quantum statistics, explain the statistical behaviour of ideal system (Maxwell, Bose & Fermi) and calculate the statistical quantities.

		3. Apply the Bose-Einstein and Fermi-Dirac distributions appropriately to understand the macroscopic properties. (Black body radiation, electrons in metals, paramagnetismetc.) 4. Formulate theories and microscopic models to explain the properties of complex system. (Ising model, Bose-Einstein condensation, liquid helium II) 5. Describe the role of fluctuations and transport phenomena in a system.
PEPHA20	**ELECTIVE IA: ELECTRONIC DEVICES AND APPLICATIONS**	1. Analyze about the fabrication of various Integrated circuits and semiconductor devices (construction, working, principles and V-I characteristics) and their applications. 2. Ability to understand about the basic principles and operations of opto electronic devices and their features and applications. 3. To study the Timer IC and its applications. 4. To know the principles, configuration, linear and non-linear applications of Op-amp used to design various digital circuits. 5. To understand the concepts of combinational circuits and sequential circuits and A/D –D/A converters used to design advanced digital system.
PEPHB20	**ELECTIVE IB: ELECTRONIC COMMUNICATION SYSTEMS**	1. Compare the performance of AM, FM and PM schemes with reference to SNR. 2. Design encoder and decoder schemes for error control. 3. Understand the orbital and functional principles of satellite communication systems. 4. Understand the evolution of cellular communication systems up to and beyond 3G. 5. Understand fundamentals of wireless communications.
PIPHA20	**IEP: PHYSICS FOR SET / NET - PAPER-I**	1. Describe and understand the motion of a mechanical system using Lagrange-Hamilton formalism. 2. Design and analyze of electronic circuits 3. Develop a digital logic and apply it to solve real life problems. 4. Ability to identify the properties of substances on property diagrams and obtain the data from property tables. 5. To acquire knowledge about classical and Quantum statistical mechanics.
PIPHB20	**IEP: ASTRO PHYSICS**	1. In-depth knowledge within the defined area of astrophysics. 2. Explain stellar evolution, including supernovas, neutron stars, pulsars, white dwarfs and black holes, using evidence and presently accepted theories. 3. Detail the presently accepted formation theories of the solar system based upon observational and physical constraints. 4. Detail the main features and formation theories of the various types of observed galaxies, in particular the Milky Way. 5. Develop observation skills to be able to explain

		astronomical features and observations obtained via telescopic observations.
PCPHD20	**MATHEMATICAL PHYSICS – II**	1. Apply concepts of complex analysis to evaluate definite integrals. 2. Explain various operations of tensors and apply in many branches of science. 3. Apply Laplace/Fourier transforms to solve mathematical problems and use Fourier transforms as an aid for analysing experimental data. 4. Use various probability distribution methods to analysis any experimental event. 5. Apply the concept of group theory in the domain of physical sciences.
PCPHE20	**ELECTROMAGNET IC THEORY**	1. Able to understand and apply the basic principles of electrostatics 2. Analyses the properties of magnetostatic field through current distribution with the application of various laws and conditions. 3. Able to perceive the propagation and interaction of electric and magnetic fields through free space and matter 4. Imbibes the wide-spread knowledge about radio communication with its mathematical applications. 5. Acquires the comprehensive knowledge of the various applications of antennas
PCPHF20	**QUANTUM MECHANICS - I**	1. Understand the concepts of Quantum Mechanics. 2. Apply the concept of Quantum mechanics to various problems. 3. Understand various representations in Quantum Mechanics. 4. Attain knowledge about various approximation methods and their applications. 5. Acquire knowledge about Angular momentum and commutation rules.
PEPHC20	**ELECTIVE II A: CRYSTAL GROWTH, NANO SCIENCE AND RESEARCH METHODOLOGY**	1. Explain the fundamental concepts behind in the formation of crystal. 2. Demonstrate the various methods in crystal growth techniques and their advantages. 3. Understand the advanced methods of characterization instruments for crystal and nanomaterials. 4. To familiarize about the physical concepts and principles of nanoscience and nanotechnology. 5. Provide a broad view of various approaches for the synthesis and fabrication of nanostructures and their outstanding properties useful to carry out their project and research work.
PEPHD20	**ELECTIVE II B: ELECTRONIC INSTRUMENTATION**	1. Describe the Principle and working of Transistor, Thyristor and other electronic equipments used to measure the physical parameters such as Temperature, pressure and force etc., , 2. Attain the knowledge of working principle of digital

		instruments (digital pH meter, digital storage oscilloscope, digital multimeter etc.,) 3. Demonstrate about the description of analytical Instruments (UV-VIS Spectrometer, IR Spectrometer, Flame Emission Spectrometer and ICP-AES Spectrometer) which was used to characterize the materials and analyze the results. 4. Impart the knowledge in working of Bio medical instruments and its applicable to find out any defects in our human body and to save our life. 5. Understand about the essential partsof the computer and their need anddevelop the skills to handle above all instruments useful for our carrier.
PIPHC20	**IEP: PHYSICS FOR SET/NET - PAPER – II**	1. Recall and apply the concepts and methods in mathematical physics and solve relevant problems in any competitive exams. 2. Understand the characteristics of special functions to solve the physical problems. 3. Apply concepts of complex analysis to evaluate definite integrals, tensors, probability distribution methods and group theory in the domain of physical sciences. 4. Recall and apply the concepts and methods in Electromagnetic theory and solve problems quantitatively in any competitive exams. 5. Acquires comprehensive knowledge of the various applications of wave guides, Maxwell's equations.
PIPHD20	**IEP: MEDICAL PHYSICS AND INSTRUMENTATIO N TECHNIQUES**	1. Explain the effect of pressure on human system. 2. Explain the physics of lungs and respiratory system. 3. Explain the physics of cardiovascular system. 4. Explain the application of electricity and magnetism in medicine. 5. Explain medical imaging techniques.
PCPHG20	**PRACTICAL - I: GENERAL EXPERIMENTS**	1. Measure electrical, magnetic and thermo-dynamical properties of solids. 2. Measure the thickness of glass plate (mechanical property) by using cornu's method 3. To find the wavelength of different colors through solar, mercury and hydrogen spectrum. 4. Calculate the acceptance angle and light gathering capability and attenuation properties of optical fiber and find out the Viscosity, specific rotary power and polarizability of different liquids through various experiments. 5. Develop the skills to take an accurate reading and analyze the results of experiments and to solve problems while handling with analytical instruments.
PCPHH20	**ELECTRONICS LAB**	1. Identify the various digital ICs and understand their operation. 2. Develop a digital logic and apply it to solve real life problems. 3. Analyze, design and implement combinational logic circuits.

		4. Analyze, design and implement sequential logic circuits.
		5. Design the different oscillator circuits for various frequencies.
PCPHI20	**SPECTROSCOPY**	1. Describe theoretical background (classic and quantum) of spectroscopic techniques such as microwave, IR and Raman, NMR, NQR, ESR and Mossbauer spectroscopy.
		2. Apply solutions of the Schrodinger equations for simple systems (rigid rotor and harmonic oscillator) to real systems (rotational and vibrational) for use in determining the molecular energy levels.
		3. Analyse rotational and vibrational (microwave, IR& Raman) spectra to determine the molecular structure and physical constants.
		4. Interpret NMR, NQR, ESR and Mossbauer spectra to obtain the information about the chemical, structural and magnetic properties of the material.
		5. Outline the methods, instrumentation and applications (any one application) for the following spectroscopic techniques: microwave, IR, Raman, NMR, NQR, ESR and Mossbauer spectroscopy.
PCPHJ20	**QUANTUM MECHANICS - II**	1. Understand the concept of scattering theory.
		2. Achieve knowledge about Perturbation theory.
		3. Attain Knowledge about relativistic Quantum Mechanics.
		4. Assimilate the concepts of Dirac equation and its applications.
		5. Gain knowledge about Quantization of fields.
PCPHK20	**MICROPROCESSOR AND MICRO-CONTROLLER**	1. Describe Hardware, different bus cycles and memory interface to 8085 Microprocessor.
		2. Develop programs using 8085 Microprocessor Instruction set and addressing modes.
		3. Describe and perform different types of peripheral interfaces to 8085 Microprocessor.
		4. Explain hardware, instruction set and addressing modes of Microcontroller 8051 and develop programming for basic operations.
		5. Describe and perform different types of external interfaces to 8051 Microcontroller.
PEPHE20	**NUMERICAL METHODS AND C-PROGRAMMING**	1. Understand and apply numerical concepts to solve equations and find missing values for any physical problems
		2. Solve ordinary differential equations using numerical techniques
		3. Understand the basic concepts of C Language
		4. Understand and use various operators and arrays in C Language
		5. Develop simple programs using C language along with computational tools
PEPHF20	**ELECTIVE - III B: ADVANCED OPTICS**	1. Understand the basic concepts of Laser theory
		2. Understand and describe the different types of Laser
		3. Explain the propagation of Laser beam

		4. Describe the principle, types and loss of optical fiber
		5. Understand the importance of nonlinear optics and apply the concepts of NLO to optical materials.
PIPHE20	**IEP: PHYSICS FOR SET/NET-PAPER III**	1. Understand about Schrödinger equation, ladder operators and the concepts of time independent theory to solve Eigen value problems
		2. Describe the properties of relativistic quantum mechanics and solve the problems using Fermi's Gold rule.
		3. Understand the energy levels and structure of hydrogen atom and to solve the problems using ESR, NMR and Frank-Condon Principle.
		4. Attain the basic concepts and theories in basic elements of atomic and molecular spectroscopy, classical/Quantum description of electronic, vibrational and rotational spectra and solve the problem related to that.
		5. Gain the knowledge to solve the problems by using the theory of Raman, NMR and Spin resonance spectroscopy in order to face competitive exams and for perusing higher research work.
PIPHF20	**IEP: NUMERICAL METHODS & RESEARCH METHODOLOGY**	1. Understand and apply numerical concepts to solve equations and evaluate any integrals
		2. Solve ordinary differential equations using numerical differentiation techniques
		3. Understand the basics of research and research methodology
		4. Define research problem in their own domain and describe various research design
		5. Draw a good research report and impart research communication techniques
PCPHL20	**MATERIALS SCIENCE AND LASER PHYSICS**	1. To acquire knowledge about phase diagrams
		2. To Impart knowledge about defects in crystals
		3. Learn the basic principles of optical, Dielectric and Ferro Electric properties of materials
		4. To acquire knowledge about polymer and ceramics
		5. To understand the principle and working of Lasers
PCPHM20	**NUCLEAR AND PARTICLE PHYSICS**	1. Apply core concepts in physics to understand nuclear interactions, features of nuclear reactions and characteristics of radioactive decays (beta & gamma).
		2. Describe basic nuclear structure and nuclear properties by applying the mathematical theory and models (liquid drop model, Shell model, collective model, optical model etc.)
		3. Evaluate some basic nuclear parameters such as radius, BE, Q-value, nuclear spin, parity etc.
		4. Classify elementary particles (based on interactions and spin) and explain the fundamental concepts in particle physics (conservation laws, parity violation, interactions etc.)
		5. Study the substructure and symmetries in elementary particles (SU (2) &SU (3)); apply Quark model to find the missing particle.

PCPHN20	**CONDENSED MATTER PHYSICS**	1. Able to correlate the X-ray diffraction pattern for a given crystal structure. 2. Formulate the theory of lattice vibrations and use that to determine thermal properties of solids. 3. Ability to understand theory of metals and semiconductors. 4. Able to differentiate between ferroelectric, anti-ferroelectric materials. 5. Able to differentiate between type-I and type-II superconductors and their theories.
PEPHG20	**ELECTIVE IV A: FIBER OPTICS AND NON-LINEAR OPTICS**	1. Understand the basic principles and concepts in optical fiber and describe the properties of optical sources. 2. Distinguish between the various types and the characteristics of optical fiber. 3. Analyze and comparing the different fabrication process of fiber. 4. Describe various losses and connectors in optical fiber. 5. Understand non-linear effects in optical fiber and their applications.
PEPHH20	**ELECTIVE IV B: ADVANCED MATERIAL SCIENCE**	1. Understand the building unit of structure of crystal and their symmetry. 2. Interpret about the magnetic properties and effects on materials 3. Attain the knowledge of superconducting materials and problem solving. 4. Pick up the ideas in lasing action, optical resonators and its applications. 5. Get introduced all about smart, nano and magnetic materials and its application useful to carry out the research work and fabricating the devices for public utility.
PIPHG20	**IEP: PHYSICS FOR SET/NET - PAPER IV**	1. Understand the basic properties of nucleus and nuclear models. 2. Gain the knowledge about the elementary particles and quantum numbers. 3. Impart knowledge of finding solutions to any differential equations and Interpolation by using Newton's method, Simpson's and Trapezoidal rules. 4. Attain the basic concepts and theories in crystals and magnetism and develop the skills to solve the problems in the respective filed for performing higher studies and research. 5. Understand the basic concepts in superconductors.
PIPHH20	**IEP: ADVANCED NUCLEAR PHYSICS AND SPECTROSCOPY**	1. Explain the basic concepts of nuclear detectors and particle accelerators. 2. Explain the basic aspects of astrophysics. 3. Explain the principles, working and application of nuclear spectroscopic techniques (RBS, NAA, PIXE) and other applications of nuclear physics. 4. Explain the basic principles, instrumentation and

		applications of UV spectroscopy.
		5. Explain the basic principles, instrumentation and applications of atomic absorption and emission spectroscopy.
PCPHO20	PRACTICAL III: ADVANCED GENERAL EXPERIMENTS	1. Interpret and appreciate the advanced concepts in physics.
		2. Use scientific equipment for analysis and data acquisition.
		3. Analyse the properties (electric, magnetic, nuclear and dielectric) of solids/liquids.
		4. Apply acquired knowledge to the analysis of experimental data.
		5. Get exposure to work environment at research level and motivation for a lifelong learning.
PCPHP20	PRACTICAL- IV MICROPROCESSOR MICROCONTROLLER AND C PROGRAMMING	1. Develop assembly language programs on arithmetic and sorting operations using 8085 and 8051
		2. Develop and perform peripheral interface programs with 8085 Microprocessor
		3. Perform all code conversions and analog signals into digital and vice versa. Also can generate wave forms.
		4. Write C program for any basic operations
		5. Solve any physical problems using C language along with numerical techniques
M.Sc. ZOOLOGY	
PCZOA20	PHYLOGENY OF INVERTEBRATA AND CHORDATA	1. Analyze the taxonomic status of Invertebrates, its origin and Evolution
		2. Categorize Respiratory, Circulatory and Urinogenital system of various classes of vertebrates.
		3. Justify adaptive radiations of annelids, molluscs, pisces, amphibians and mammals.
		4. Explain salient features of invertebrate and chordates.
		5. Distinguish structural, functional and phylogenetic significance of minor phyla.
PCZOB20	MOLECULAR BIOLOGY AND GENETICS	1. Expand knowledge of DNA, RNA structure and understand their synthesis process.
		2. Summarize transcription and translation concepts.
		3. Describe transcriptional modification mechanism.
		4. Interpret various genetic disorders and genetic variation in metabolism.
		5. Discuss genetic recombination and analyze genetic concepts.
PCZOC20	APPLIED BIOTECHNOLOGY AND MICROBIOLOGY	1. Explain the benefits of microbes in production and value addition of food products.
		2. Apply the tools and techniques used in molecular biology.
		3. Solve the problems related to biotechnology keeping in mind the safety factor for environment and society.
		4. Discuss the basic techniques used in genetic manipulation. Biosafety and ethical issues.
		5. Explain transgenic animals and their use in research field.
PEZOA20	ELECTIVE IA: BIOSTATISTICS	1. Describe statistical population, sampling and probability.
		2. Explain and perform standard deviation, Student t test and

	AND COMPUTATIONAL BIOLOGY	Chi square Test. 3. Compute Correlation, Regression and ANOVA. 4. Discuss the databases and application of search tools. 5. Explain genomics, proteomics, drug designing and phylogenetic tree analysis.
PEZOB20	**ELECTIVE - I B: COMPUTATIONAL METHODS FOR SEQUENCE ANALYSIS**	1. Explain and classify the biological databases and its application. 2. Describe the sequence alignment, substitution matrices, and score matrices and search tools. 3. Analyze the evolutionary distance and boot strapping strategies. 4. Asses the genomic sequences, gene finding and analyses the regulatory regions. 5. Explain the secondary structure and gene identification.
PCZOD20	**RESEARCH METHODOLOGY**	1. Describe the principle and working mechanisms of various instruments. 2. Interpret theoretical knowledge of various biological instruments useful for research. 3. Demonstrate critical thinking in designing research problem and find the solution to scientific research problem. 4. Discuss research based acquaintance in designing the experiments and interpretation of data with research tools. 5. Explain scientific ideas in both written and oral formats.
PCZOE20	**APPLIED ENTOMOLOGY**	**1.** Identify the pest in different cash crops and the mode of infection. **2.** Analyze the pest species of vegetables, fruits, stored grains and household pests. 3. Categorize the different insect pests and vectors of livestock. 4. Explain the classification of insecticides and the mode of action. 5. Apply appropriate method of insect pest management and integrated pest management.
PCZOF20	**BIODIVERSITY AND WILDLIFE CONSERVATION**	1. Discuss the Biodiversity India and ecosystems. 2. Explain the values of Biodiversity. 3. Discuss the Wildlife of India and threats to the wildlife. 4. Explain Wildlife protection and conservation. 5. Explain conservation methods.
PCZOG20	**PRACTICAL I INVERTEBRATA, CHORDATA, MOLECULAR BIOLOGY, GENETICS, BIOTECHNOLOGY AND MICROBIOLOGY**	1. Demonstrate and dissect different systems of specimen. 2. Identify structural modification of chordates, adaptive feature based on mode of life and chromosomes. 3. Identify and explain various inborn errors of metabolism, describe karyotyping and identify functional gene in given sequence. 4. Gain practical insights on various instruments used in molecular biology. 5. Identify /explain various microorganisms, transgenic animals and GM plants.
PCZOH20	**PRACTICAL II - RESEARCH**	1. Apply basic concepts of instrumentation. 2. Gain skills in techniques of chromatography, electrophoresis

	METHODOLOGY, APPLIED ENTOMOLOGY, BIODIVERSITY AND WILDLIFE CONSERVATION	and spectroscopy. 3. Demonstrate Histochemical staining techniques. 4. Summarize the insect pest and their control measures. 5. Explain biodiversity and explore the fauna existing around for documentation and motivates for further studies and research in the field.
PEZOC20	ELECTIVE II A: BIOCHEMISTRY	1. Explain the atom and types of bonds and buffers. 2. Explain the properties of water body fluids its biological function and Classification of Amino acids. 3. Appraise the classification, properties and mode of action of Protein and Enzyme. 4. Summarize the complexity of the carbohydrate metabolism. 5. Categorize the Vitamins and its importance.
PEZOD20	ELECTIVE II B: ENDOCRINOLOGY	1. Discuss hormones its classification and function, the anatomy of endocrine glands, 2. Explain Pituitary and Parathyroid Structure and Function. 3. Comprehensive knowledge about structure and function of Pancreas and Adrenal glands. 4. Describe the complexity of the endocrine system of invertebrates. 5. Elucidate hormones in development.
PCZOI20	ENVIRONMENTAL BIOLOGY	1. Describe ecological succession and Environmental stresses and their management. 2. Explain the major classes of contaminants and their impact on environment. 3. Explain green energy and the types of recycling technologies for solid and liquid wastes and their role in environmental conservation. 4. Discuss environmental indicators and their role in environmental balances and bioremediation. 5. Explain the importance of global ecology towards sustainable civilization.
PCZOJ20	LIMNOLOGY AND TOXICOLOGY	1. Attains basic concept about fresh water habitats and its types. 2. Describe the Physio-Chemical Characteristics and its importance in freshwater ecosystems. 3. Summarize about the organisms and adaptation in the freshwater ecosystem. 4. Explain the basic knowledge about toxicology its principle, agents and estimation methods. 5. Describe the impact of toxicant in the aquatic ecosystem.
PCZOK20	ANIMAL BEHAVIOUR	1. Discuss the innate, acquired and group behaviours. 2. Explain the habitat selection and foraging methods of animals. 3. Compute the interspecific behaviours. 4. Explain about communication in animals. 5. Analyze Social behaviours in animals.
PEZOE20	ELECTIVE III A: CLINICAL	1. Develop technical knowledge in laboratory practices and apparatus maintenance.

	LABORATORY TECHNIQUES	2. Examine blood composition and basic hematological techniques. 3. Justify the pathology of diseases caused by parasites, virus, bacteria & fungus. 4. Discuss experimental techniques and methods of urine analysis. 5. Analyze the results of physical, microscopic and biochemical analysis of body fluids.
PEZOF20	**ELECTIVE III B: FISHERIES SCIENCE**	1. Explain the morphology and physiology of Indian fishes. 2. Analyze the environmental and nutritional requirements of fishes. 3. Understand the types, distribution and scope of inland fisheries. 4. Impart theoretical knowledge on surveying methods of fishery resources. 5. Acquire knowledge on various threats and conservation strategies of Indian fishes.
PCZOM20	**PHYSIOLOGY AND ENDOCRINOLOGY**	**1.** Expand knowledge about the enzymes, digestive system and interaction of complex metabolic pathway, respiration and the adaptation at extreme conditions. **2.** Summarize the circulatory and excretory system with its structure, function and regulatory mechanism. **3.** Discuss the muscular and nervous system structure, function and regulation. **4.** Describe hormones its classification and function, the anatomy of endocrine glands. 5. Interpret endocrine system with its function and regulation in reproduction.
PCZON20	**DEVELOPMENTAL BIOLOGY AND IMMUNOLOGY**	1. Explain the chemo differentiation in the egg during development. 2. Describe the organizer and cellular differentiation, genetic defects, aging regeneration and teratogenesis. 3. Discuss the various forms of asexual reproduction, artificial fertilization and stem cells. **4.** Summarize the cells of Immune system and immune response. 5. Explain the importance of immune therapy in treatment of diseases.
PCZOO20	**EVOLUTION**	1. Analyse the evidences of evolution, and importance of paleontology. 2. Compare the evolutionary theories, trends and mechanism of evolution. 3. Justify the adaptations for successful continuation of life and extinction. 4. Appraise the distribution of animals and geological time scale. 5. Explain the Human origin and evolution.
PCZOP20	**PRACTICAL III - ENVIRONMENTAL**	1. Perform practical procedures in ecology. 2. Describe the adaptive features of animals with reference to

	BIOLOGY, LIMNOLOGY, TOXICOLOGY AND ANIMAL BEHAVIOUR	their habitat and ethology. 3. Prepare slides of planktons. 4. Perform Toxicology studies. 5. Discuss water treatment through water treatment plant visits.
PCZOQ20	PRACTICAL IV PHYSIOLOGY, ENDOCRINOLOGY, DEVELOPMENTAL BIOLOGY, IMMUNOLOGY AND EVOLUTION	1. Analyze physiological parameters. **2.** Interpret Endocrine glands and Endocrine disorders. 3. Explain immunological importance of WBC and principle on antigen antibody reaction in ABO grouping. 4. Identify the developmental stages, placenta, and histology in development biology. 5. Compare the evolutionary significance, mimicry and adaptation in animals.
PEZOG20	ELECTIVE IV A: FISHERY BIOLOGY	1. Apply the parameters for the growth of fish, biology of fish and gears in fishery. 2. Acquire knowledge of biology and techniques of shell fisheries. 3. Apply knowledge in establishing and managing sea weed and pearl culture and byproducts of fishery. 4. Differentiate the types of fish cultures pathogens and their control measures. 5. Explain the processing, transportation and marketing of Fishes.
PEZOH20	ELECTIVE IV B: AQUACULTURE AND FARM MANAGEMENT	1. Describe parameters of aquatic environment for aquaculture and farm management. 2. Elucidate biological criteria and economic significance of cultivable species. 3. Discuss seed production and hatchery management of commercially important cultivable fishes. 4. Explain different types of fish cultures techniques. 5. Analyse water quality parameters and biotechnological tools in disease diagnosis of culture fishes.
PIZOA20	INDEPENDENT ELECTIVE I A- PET KEEPING	1. Analyze the present status of maintaining pets and its needs. 2. Interpret on varied dog breeds and train them. 3. Identify cat breeds and trace the diseased cat and treat them. 4. Expand knowledge on best choices of bird breed for business. 5. Elucidate commercially important fishes and understand the construction and requirement for setting aquarium to become an entrepreneur.
PIZOB20	INDEPENDENT ELECTIVE I B- BIOPHYSICS	1. Recall the basic concepts of Biophysics. 2. Describe and apply the law of thermodynamics of the biological system and concepts of energy 3. Explain the membrane conductivity and transport. 4. Explain the principle techniques and application of lasers in biomedical field. 5. Discuss the working principle, instrumentation and applications of bio-analytical instruments.
PIZOC20	INDEPENDENT	1. Explain the management of livestock.

	ELECTIVE II A- ANIMAL HUSBANDARY	2. Expand the knowledge to differentiate special breeds of cattle. 3. Elucidate different methods of breeding. 4. Summarize on the nutritive feeding practice of cattle. 5. Provide intensive ideas on management of cattle.
PIZOD20	**INDEPENDENT ELECTIVE II B- ECO ENERGETICS AND ECOLOGICAL**	1. Explain the structure and functions of ecosystem. 2. Discuss the productivity and methods of measuring productivity. 3. Summarize about sampling and extraction techniques. 4. Describe the methods of wild life population studies. 5. Categorize the planktons, method of collection, preservation and morphological identification.
PIZOE20	**INDEPENDENT ELECTIVE III A- RADIATION BIOLOGY**	1. Apply the fundamentals of radiation biology. 2. Explain the effects of Radiation on DNA and its effects. 3. Analyze the radiation exposure and response. 4. Asses the role of radiation in carcinogenesis. 5. Explain radio therapy, protection and precaution in using radioisotopes.
PIZOF20	**INDEPENDENT ELECTIVE III B- DAIRYING**	1. Discuss the development and management of dairying. 2. Explain properties of milk and its composition. 3. Describe various periods of milking, variations in compositions and equipments used in milking. 4. Discuss entry of bacteria into milk and types of bacteria. 5. Explain various methods of pasteurization.
PIZOG20	**INDEPENDENT ELECTIVE IVA- BIOSYSTEMATICS**	1. Explain the concept, importance and attributes of biosystematics. **2.** Discuss the biological characteristics. 3. Compute the evolutionary relationship among the organisms. **4.** Familiarize different taxonomic procedures, taxonomic keys and zoological nomenclature. 5. Apply phylogeny classification at species level and infra species level.
PIZOH20	**INDEPENDENT ELECTIVE IV B - GENERAL PSYCHOLOGY**	1. Explain Psychology and its branches. 2. Define concept of self and describe the theories of Personality. 3. Discuss the need of social psychology. 4. Explain Psychopathology. 5. Apply the knowledge of psychology in different areas like forensic, family, court etc.
PIZOI20	**INDEPENDENT ELECTIVE IVC- ANIMAL CARE**	1. Expand knowledge on animal feeding. 2. Acquire knowledge on requirements for animal accommodation. 3. Recognize sick animals and diagnostic procedures to determine the disease. 4. Apply their knowledge in handling, restraining and transporting animals. 5. Explain animal psychology, innate behavior and survival.

M.Sc. MICROBIOLOGY		
PCMBA20	**GENERAL MICROBIOLOGY**	1. Outline history and recent developments in the field of Microbiology. 2. Demonstrate and utilize working of different laboratory instruments. 3. Acquire knowledge on the sample preparation and perform various staining techniques. 4. Discuss important taxonomical aspects of bacteria, fungi, algae and virus. 5. Compile bacterial anatomy and physiology and structural properties of algae and fungi**.**
PCMBB20	**FOOD, AGRICULTURE AND ENVIRONMENTAL MICROBIOLOGY**	1. Analyse the principles in food preservation. 2. Communicate diseases associated with food. 3. Discuss the role of microorganisms in soil and microbial interaction. 4. Utilize the knowledge on biogeochemical cycles to produce biofertilizers**.** 5. Assess information about microbiological quality of air and water.
PCMBC20	**IMMUNOLOGY AND IMMUNOTECHNOLOGY**	1. Outline the types of immune response and discuss the role of lymphoid organs in immunity**.** 2. Compile immunoglobulins and antigens. 3. Communicate the importance of MHC in organ transplantation. 4. Analyse the allergic responses by the immune system leading to hypersensitive conditions and auto immune disorders. 5. Plan immunization schedule.
PEMBA20	**ELECTIVE I-A - PETROLEUM MICROBIOLOGY**	1. Outline the importance of petroleum Microbiology and predict the impact of the microbial communities in various petroleum fields. 2. Design the microbial solutions to the microbiology related problems in the petroleum industry. 3. Discuss solutions to enhance production of oil/energy by applying concepts of production related petroleum microbiology. 4. Utilize biotechnological aspects in remediation of oil spills. 5. Use apparatus for the detection of living microbial contaminants in petroleum products.
PEMBB20	**ELECTIVE I-B- ECONOMIC MICROBIOLOGY**	1. Utilize microorganisms as biofertilizers and for vermicomposting. 2. Analyse microbial cells as fermented products. 3. Use yeast in and as food and feed. 4. Demonstrate mushroom cultivation and its storage. 5. Discuss biotechnological applications of microalgae.
PCMBD20	**MEDICAL MICROBIOLOGY**	1. Outline the basics of Medical Microbiology and describe the mode of transmission of various pathogens. 2. Select methods to identify the causative agents for clinical diagnosis. 3. Analyse pathogenic microorganism of bacteria and its

		mechanism of pathogenesis.
		4. Discuss on pathogenic fungi and parasites.
		5. Compile virus structure, multiplication, classification and medical importance.
PCMBE20	**MICROBIAL PHYSIOLOGY AND BIOMOLECULES**	1. Explain microbial metabolism, growth and energy generation.
		2. Analyse microbial physiology, different classes of antimicrobial agents and their mode of action.
		3. Evaluate the properties of carbohydrates in metabolism.
		4. Compile the process involved in synthesis of nucleic acid.
		5. Outline the steps involved in post transcriptional and translational modification
PCMBF20	**INDUSTRIAL AND PHARMACEUTICAL MICROBIOLOGY**	1. Outline the importance of production strain in industries.
		2. Discuss on fermentors and fermentation process.
		3. Describe the upstream and downstream processing.
		4. Analyse the steps involved in vaccine, toxoid and antisera production and evaluate the standardization of antiseptics and disinfectants..
		5. Assess good practice and regulation involved in utilizing microbial product for pharmaceutical applications**.**
PEMBC20	**ELECTIVE II-A-BIOLOGICAL TECHNIQUES**	1. Discuss about various microscopes, its parts and their working mechanism.
		2. Apply the principle and usage of spectroscopic, centrifugation, biosensors and radioactive analysis.
		3. Analyse principles and applications of chromatographic techniques.
		4. Demonstrate principles and applications of electrophoresis.
		5. Compile the techniques involved in molecular biology.
PEMBD20	**ELECTIVE II-B-HUMAN ANATOMY AND PHYSIOLOGY**	1. Discuss protective mechanism of respiratory system and sensory organs.
		2. Explain the role of gastrointestinal system and lympho -reticular system.
		3. Identify the major components of musculoskeletal and nervous system.
		4. Analyse the production of RBC, compare the role and function of endocrine system.
		5. Revise the anatomical differences between male and female reproductive and urinary system.
PCMBG20	**MAIN PRACTICAL – I: APPLIED MICROBIOLOGY AND IMMUNOLOGY**	1. Identify morphology of bacteria using different staining procedure and isolating them by pure culture techniques.
		2. Assess the quality of air, water, food and soil samples.
		3. Examine the activity of extracellular enzymes.
		4. Apply agglutination and precipitation methods to detect antigen and antibody.
		5. Select appropriate chromatographic methods to separate aminoacids, pigments and from crude extracts.
PCMBH20	**MAIN PRACTICAL – II: MEDICAL MICROBIOLOGY**	1. Demonstrate collection, transport and processing of clinical specimens.
		2. Identify the bacterial pathogens from various clinical samples and detect their antimicrobial activity.

		3. Analyse the clinical specimens for the examination and cultivation of pathogenic fungi.
		4. Estimate worm burden stool for the identification of parasite.
		5. Enumerate blood cells.
PIMBA20:	**INDEPENDENT ELECTIVE COURSE IEC- I: PUBLIC HEALTH MICROBIOLOGY**	1. Explain the significance of public health.
		2. Communicate the mode of transmission of human diseases.
		3. Discuss the role of medically important pathogens and the diseases caused.
		4. Outline the vector complex interactions between the pathogens and host.
		5. Create awareness on hospital-acquired infections, prevention and its control measures.
PIMBB20	**INDEPENDENT ELECTIVE COURSE IEC-II: ANIMAL TISSUE CULTURE**	1. Introduce the importance of cell culture.
		2. Demonstrate knowledge of cell lines used in tissue culture, their origins and applications and explain major components of cell and tissue culture media.
		3. Identify methods to maintain cultures of animal cells and established cell lines with good viability and minimal contamination.
		4. Utilize hybridoma technology for monoclonal and polyclonal antibodies production.
		5. Outline the applications of animal cell culture.
PIMBC20	**INDEPENDENT ELECTIVE COURSE IEC –III: HAEMATOLOGY AND BLOOD BANKING**	1. Outline the ABO blood grouping and Rh typing.
		2. Apply techniques to collect and store blood samples.
		3. Describe the composition of blood and discuss on various blood disorders.
		4. Perform routine haematological tests.
		5. Elaborate the clinical significance of blood transfusion.
PIMBD20	**INDEPENDENT ELECTIVE COURSE IEC -IV: FORENSIC SCIENCE**	1. Outline the history, scope and development of forensic science.
		2. Evaluate the methods underpinning forensic science, from crime scene investigation to report evidential value within a case.
		3. Reflect on the use of various divisions of forensic science in the crime investigation.
		4. Explain the theory of DNA fingerprints, blood pattern analysis, footwear and tool mark impression evidence, and drugs of abuse in the context of Forensic Science.
		5. Utilize psychological principles in crime investigation.
PCMBI20	**MOLECULAR BIOLOGY AND MICROBIAL GENETICS**	1. Discuss molecular mechanisms underlying mutations.
		2. Explain the concepts of gene transfer mechanism in prokaryotes and eukaryotes.
		3. Identify the role of plasmids as cloning vectors.
		4. Evaluate on the role of transposable elements with gene mapping.
		5. Analyse the control methods for gene expression.
PCMBJ20	**ADVANCED MICROBIOLOGY**	1. Utilize microorganisms in the preparation of cosmetics.
		2. Evaluate the biological potential in samples return from

		satellites and solar system.
		3. Discuss the role of antimicrobial fabrics, carpets, tiles and colorants.
		4. Produce bacteriostatic sanitary napkins and towels.
		5. Comprehend on paper, rubber and plastic Microbiology
PCMBK20	**RESEARCH METHODOLOGY**	1. Explain basic concepts of research and its methodologies.
		2. Identify the relationship between methodology, framework and data collection.
		3. Analyze the diverse cases using statistical methods.
		4. Use of digital library as a resource of microbiological research.
		5. Discuss the principles and algorithms of pairwise and multiple alignments, and sequence database searching.
PEMBE20	**ELECTIVE-IIIA: BIOINOCULANTS TECHNOLOGY**	1. Outline the importance of bioinoculant technology and discuss on the significance of biofertilizers.
		2. Demonstrate the mass production and applications of bio fertilizer and their impact on plant growth.
		3. Identify in-depth information on the mycorrhizal taxonomy, occurrence and distribution.
		4. Explain the types of mycorrhizal associations and quantification.
		5. Formulate the growth of phosphate solubilizing microbes.
PEMBF20	**ELECTIVE III-B: FUNGAL BIOTECHNOLOGY AND BIOPROSPECTING**	1. Perform screening and strain development for production of different bio-molecules.
		2. Design a bioreactor with special emphasis on fungal systems.
		3. Comprehend about different secondary metabolites of fungal origin.
		4. Demonstrate methods of recombinant technology with special emphasis on fungal system.
		5. Explain the role of fungi in food and feed industries.
PCMBL20	**MICROBIAL GENE TECHNOLOGY**	1. Analyze the various techniques involved in identification and quantification of nucleic acids.
		2. Utilize the tools and techniques of genetic engineering and the role of DNA manipulative enzymes.
		3. Compile DNA sequencing methods.
		4. Explain about genomic libraries and artificial chromosomes.
		5. Discuss the modern tools and techniques of genomics and application of antisense technologies.
PCMBM20	**BIOETHICS AND BIOSAFETY**	1. Outline the principles of bioethics and explain the biosafety concerns with safeguard measures.
		2. Compile the BSA statement for the industrial production of pharmaceuticals.
		3. Adapt the WHO quality standards in food process technology.
		4. Discuss on the global scenario of patenting.
		5. Comprehend the forms of patents, patentability and process of patenting.
PEMBG20	**ELECTIVE IV-A:**	1. Introduce Microbial classification and Taxonomy.

	TAXONOMY AND MICROBIAL BIODIVERSITY	2. Describe the classification system in prokaryotes. 3. Comprehend the classification of virus. 4. Discuss on the eukaryotic diversity and endosymbiotic theories. 5. Compile cytology of algae and protozoa.
PEMBH20	**ELECTIVE IV-B: MICROBIAL NANOTECHNOLOGY**	1. Outline the history of bionanotechnology. 2. Describe about molecular nanotechnology and microbial synthesis of nanoparticles. 3. Discuss on types, function and characterization of nanoparticles. 4. Comprehend the use of nanoparticles in cancer therapy and in biology. 5. Elaborate the advantages and disadvantages of nanoparticles.
PCMBN20	**MAIN PRACTICAL – III: GENETIC ENGINEERING**	1. Utilize technical skills in isolation of DNA, their quantification and plasmid. 2. Analyse gene transfer mechanism and protein. 3. Use the basic skill on blotting techniques & PCR. 4. Select methods for the immobilization of enzymes. 5. Demonstrate the process of induction of mutation.
PCMBO20	**MAIN PRACTICAL – IV: TEXTILE AND COSMETIC MICROBIOLOGY**	1. Utilize the techniques for decolourization of textile industrial waste. 2. Estimate of BOD, COD and total solids in effluent sample. 3. Demonstrate the antimicrobial activity of textile materials. 4. Evaluate the antifungal property of treated textile materials. 5. Enumerate microorganisms in cosmetics, perfumes and essential oils.
PIMBE20	**INDEPENDENT ELECTIVE COURSE IEC-V: ENTREPRENEURSHIP AND MANAGEMENT IN MICROBIAL TECHNOLOGY**	1. Acquaint basic concepts of management such as planning, decision making, leadership, organization and authority. 2. Compile the motivational theories. 3. Explain the concepts of centralization and decentralization. 4. Discuss on IPR and Bioethics with an understanding of government policies. 5. Attain skill to manage start up and run an organization.
PIMBF20	**INDEPENDENT ELECTIVE COURSE IEC-VI: CYANOBACTERIOLOGY**	1. Outline the diversity of cyanobacteria. 2. Discuss on the genomics of Cyanobacteria. 3. Explain the molecular biology of Cyanobacteria. 4. Demonstrate molecular regulation of Cyanobacteria. 5. Comprehend the mass cultivation and applications of Cyanobacteria.
COURSE – TEACHING AND RESEARCH APTITUDE		
PGTRA22	**TEACHING AND RESEARCH APTITUDE**	
HUMAN RIGHTS		
PNHRA22	**HUMAN RIGHTS**	1. Obtain knowledge and understand about fundamental human rights 2. Understanding of the concepts of Indian constitution and to

		emphasize the importance of them.
		3. Promote knowledge in understanding the concept of human rights and its significance to the present scenario
		4. Able to sensitize students for the application of human rights to the various practice domains of the different profession
		5. Develop an Understanding on Human Right based on different cultural aspects.
		6. Promote awareness on the Indian legal system, rule of law, human rights related movements

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