



# **M.G.R. COLLEGE**

Approved by Government of Tamilnadu, Affiliated to Periyar University, Salem

Re-Accredited by NAAC

Recognized by UGC under section 2(f) and 12(B), New Delhi

Dr. M.G.R Nagar, HOSUR – 635 130 Krishnagiri Dist., Tamil Nadu

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## **SUPPORTING DOCUMENTS**

### **2.6.1: Programme Outcomes (POs) and Course Outcomes (COs)**

# DEPARTMENT OF ENGLISH

**Name of the Programme: Bachelor of ARTS BA (ENGLISH)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Specific Outcome(PSO):**  
**After completion of the programme, the graduates will be able to**

<b>PSO1</b>	The study of literature cultivates wisdom and a worldview
<b>PSO2</b>	It makes students appreciate their own cultural heritage and others also
<b>PSO3</b>	It helps students develop emotional intelligence and creativity

**Name of the Programme: Bachelor of ARTS B A (ENGLISH)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Outcome(PO):**  
**Upon completion of the degree requirements, students will be able to**

<b>PO1</b>	Produce focused, organized, well-developed writings and demonstrate competence in English
<b>PO2</b>	Demonstrate critical thinking skills through analysis, synthesis, and evaluation of important ideas using their proficiency in LSRW
<b>PO3</b>	effectively evaluate and fluidly integrate relevant sources, using appropriate research tools and strategies.
<b>PO4</b>	

## COURSE OUTCOME

**Name of the Programme: Bachelor of ARTS B A (ENGLISH)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
<b>I</b>	Core - I	POETRY	to understand and appreciate poetry as a literary form of art to enrich learners imagination to familiarize with variety of cultures,language and etc
	Core - II	PROSE	to provide learners an insight into the evolution of english prose from the Elizabeth age to the modern age to enable learnrs to analyses and appreciate prose critically
<b>II</b>	Core III	DRAMA	to familiarize learners with the dramatic techiques and prominent writers of the genre interpret the play critically
	Core - IV	INDIAN WRITING IN ENGLISH	to introduce learners to the major literary works of indian writes in english to enable the learnrs to realize the value of indian literature
<b>III</b>	Core V	FICTION	Study of fiction exposes the learners to variety of characters in the society Fiction is a gym, where one can exercise psychologically and t is a way to measure emotional maturity Fiction is a tool to generate various kinds of feelings which are valuable in everyone's life
<b>IV</b>	Core - VI	AMERICAN LITERATURE	Readers could explore their culture,religion, and history in general it enhance the vocabulary and understanding of the language of that country
<b>I</b>	Allied - I	SOCIAL HISTORY OF ENGLAND	to know the history of england to explore social structure changes and problems in early to modern britain context
<b>II</b>	Allied - II	HISTORY OF ENGLISH LITERATURE	to introduce all literary gens and terms to compare writers of one period with those of another
<b>III</b>	Alied-III	LITERARY FORMS AND TERMS	Develops the learners' creative writing based on forms, structures and purposes Learners understand how the English linguistic system is used for communication Learners become more critical and analytical
<b>IV</b>	Alied -IV	HISTORY OF ENGLISH LANGUAGE	learners acquire knowledge of the originand evolution of english language studentrs would be familiar with the contributions of great writers
<b>III</b>	NMEC -I	SOFT SKILLS FOR CAREER COMMUNICATION	lLearners move towards hi-tech world
<b>IV</b>	NMEC -II	COMMUNICATION FOR PLACEMENT	learners also become tech savvy in their careers

<b>Programme Specific Outcome(PSO):</b> <b>After completion of the programme, the graduates will be able to</b>			
PSO1	To educate students both in the artistry and utility of the English language through the study of literature and other contemporary forms of culture		
PSO2	To make students aware of the different communicative skills, and to develop among them an ability to effectively communicate in English, both in written and spoken modes		
PSO3	To provide students with the critical faculties necessary in an academic environment, on the job, and in an increasingly complex, interdependent world		
<b>Programme Outcome(PO):</b> <b>Upon completion of the degree requirements, students will be able to</b>			
PO1	Produce focused, organized, well-developed writings and demonstrate competence in English		
PO2	Demonstrate critical thinking skills through analysis, synthesis, and evaluation of important ideas using their proficiency in LSRW		
PO3	effectively evaluate and fluidly integrate relevant sources, using appropriate research tools and strategies.		
PO4	Recognize and comprehend different varieties of English		
COURSE OUTCOME			
<b>Name of the Programme: Bachelor of ARTS B A(ENGLISH)</b> <b>For Candidates admitted in the Colleges affiliated to Periyar University from 2019 onwards</b>			
SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
V	Core - VI	SHAKESPEARE	By studying Shakespeare, one can gain knowledge about his powerful portrayal of words and famous quotes, which are still in vogue Shakespeare's themes are timeless and continue to be relevant even after his death Shakespeare's plays are not of an age, but for all time
	Core - VII	LANGUAGE AND LINGUISTICS	Explain the basis concepts of language and linguistics research Learners get to know various analysis of language . Establishes a relationship between linguistics and language teaching
	Core - VIII	FEMINIST WRITING	Study supports the feminist goals of defining, establishing and defending equal civil, economic and social rights for women It teaches how the concepts of gender, influence social and interpersonal behaviour Learners acquire the impact of gender identity on human relations historically and cross-culturally
	Core-IX	AMERICAN LITERATURE	Learners could describe a sense of the writer's overall purpose and intent Enhance your understanding of a wide range of cultures and intellectual traditions Demonstrate the ability to analyses and interpret literary works orally and in writing
	Elective-I	ENGLISH FOR COMPETITIVE EXAMINATION	Learners would get a knowledge to face the challenges of communication in the job market In order to understand the reading writing and understanding skills of candidates
	VI	Core - IX	SOUTH ASIAN LITERATURE
Core - X		ENGLISH LANGUAGE TEACHING	know the different approaches and methods in ELT Learners to understand theoretical concept and develop their LSRW Skill
Core-XI		GRAMMAR AND SEMANTICS	Get the knowledge about structure of Language know the difference between literal and actual meaning
Elective - II		ENGLISH LITERATURE FOR COMPETITIVE EXAMINATION	Remember the literary terms forms and theories Understand he different periods of English literature Apply the learnt theories to any text
Elective-III		COMMUNICATION SKILLS PRACTICAL	

**Name of the Programme: Master of ARTS M.A (ENGLISH)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Specific Outcome(PSO):**

PSO1	To acquaint students with major trends in English literature through a detailed study of specific literary texts.
PSO2	To enable the students to understand & appreciate the various forms (i.e. drama, fiction, poetry etc.) of English literature.
PSO3	To create awareness regarding the structure of modern English and literary theory
PSO4	To introduce the various aspects of literary criticism for proper understanding and appreciation of literature
PSO5	To facilitate students to read and appreciate the literary texts

**Programme Outcome(PO):**

PO1	Enhancing knowledge of different literatures in English.
PO2	The graduates would effectively be able to use English in day-to-day life.
PO3	The ability of the graduates would be enhanced to think and write critically and clearly.
PO4	The graduates would be able to recognise the scope of English literature and language in terms of career opportunities, communication, media and soft skills
PO5	Acquisition of life skills for wider employment avenues.

**COURSE OUTCOME**

**Name of the Programme: Master of ARTS MA (ENGLISH)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

I	Core - I	CHAUCER TO THE PRE ROMANTICS	Understand the history of english Literature Get clear understand about England culture and reign
	Core - II	SHAKESPEARE	By studying Shakespeare, one can gain knowledge about his powerful portrayal of words and famous quote. Shakespeare's themes are timeless and continue to be relevant even after his death Shakespeare's plays are not of an age, but for all time
	Core - III	WORLD SHORT STORIES	Defines the type of Short stories and explain its characteristics Discuss the significance of historical period of the nation
	Core - IV	NON-BRITISH LITERATURE	Understand the other culture and tradition through literature Understand the historical event of world except British
II	Core - VII	ROMANTIC AND VICTORIAN AGE	The two era acknowledge learners with salient feathers of romantics tradition and realism Learners are able to menifest the historical, social, religious and aesthetic debates of the periods
	Core - VIII	AMERICAN LITERATURE	By studying Shakespeare, one can gain knowledge about his powerful portrayal of words and famous quotes
	Core - IX	LANGUAGE AND LINGUISTICS	Define how languages are developed in the human mind
III	Core - X	RESEARCH METHODOLOGY	Understand the basics about research and Project work
	Core - XI	20TH CENTURY LITERATURE	Makes learners to interpret the literary works and its settings Evaluate the Critical perspectives on 20th century literature
	Core - XII	LITERARY THEORY AND CRITICISM	Course helps to learn Essential terms in literary Theory It overwies learns on philosophical and methodological reflection on literature
	Core - XIII	FOURTH WORLD LITERATURE	known about Marginalization and poverty society in nation Gain the history of people living in a non-native land
IV	Core - XIV	ENGLISH LANGUAGE TEACHING AND ICT	Makes different aproches and methods in ELT Develop their LSRW and basic grammar vocabulary and study skills
	Core - XV	INDIAN WRITING IN ENGLISH	Examine and evaluate Indian literary works Written in English understand the tradition of Indain Society
	Core - XVI	JOURNALISM AND MEDIA	know the importance of Journalism to the Society Makes more professional and knowledgeable media consumers
I	Elective Course – I	ENGLISH FOR SPECIFIC PURPOSE	Learners will be able to identify effective practices in ESP Learners equips with certain english proficiency level for a situation when the language is going to be used
II	Elective Course – II	WOMEN'S WRITING	Study supports the feminist goals of defining, establishing and defending equal civil, economic and social rights for women It teaches how the concepts of gender, influence social and interpersonal behaviour
III	Elective Course – III	COMPARATIVE LITERATURE AND TRANSLATION	Gives basic idea about the field of Comparative studies ,Provides close reading techniques in a comparative frame work
IV	Elective IV	ENGLISH LITERATURE FOR COMPETITIVE EXAMINATIONS	Understand the reading,writing and understanding skills of candidates Learners would get a knowledge to face the challenges of communication in the job market
IV	Core	PROJECT	Understand the basics about research and Project work The course help to collect data, edit and identify the research problems
II	EDC	ENGLISH FOR COMPETITIVE	Meets the needs of learners to face the competitive examination Take first step to career concern

# DEPARTMENT OF BUSINESS ADMINISTRATION(BBA)

**Name of the Programme: Bachelor of Business Administration (BBA)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2022-2023 onwards**

## **Programme Specific Outcome(PSO):**

**Upon completion of the degree requirements, students will be able to**

PSO1	Promotes entrepreneurship by providing understanding of the fundamentals of creating and managing innovation, new business development, and high-growth potential entities.
PSO2	Ability to demonstrate technical competence in domestic and global arena of business through the study of major disciplines within the fields of business
PSO3	To foster thinking minds that are sensitive to societal needs and issues thus making them good human beings and responsible members of the society

**Name of the Programme: Bachelor of Business Administration (BBA)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2022-2023 onwards**

## **Programme Outcome(PO):**

**Upon completion of the degree requirements, students will be able to**

PO1	To recognize and solve business problems in an ethical manner
PO2	To communicate business information professionally
PO3	To build the department as a centre of excellence for imparting high quality management education at the undergraduate level
PO4	To stimulate in students an interest in research and initiate them into research methodologies

## **COURSE OUTCOME**

**Name of the Programme: Bachelor of Business Administration (BBA)**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
I	Core - I	Principles of Management	Understand various functions of Management Know various principles of functions of management.
	Core - II	Business Communication	To familiarize students with the mechanics of business writing To enable students to write business correspondence precisely and effectively. To Read quite widely to acquire business writing
	Allied - I	Business Mathematics and Statistics-I	To introduce the mathematical, statistical concepts and their development of analytical skills in business management. To Understand the sequence, series, matrix operations and determinants To Understand the usage of central tendencies and dispersion
		Professional English For management-I	To build english workplace vocabulary and language skills enabling them to speak confidently as well as accurately write and interpret written and oral business-oriented english.

<b>II</b>	Core - III	Organizational Behavior	To impart knowledge on factors influencing Individual and group behavior in the organizational context To make the students understand various styles of leadership To Be familiar with the factors affecting behavior To be able to differentiate and apply various leadership styles
	Core - IV	Financial Accounting	Understand the basic concepts of financial accounting Comprehend the Double entry book keeping system Acquire knowledge of accounting principles and practice Know about Prepare various books of accounts and final accounts.
	Allied - II	Managerial Economics	To analyze economics problems of business and suggest solutions and help the managers in decision makings. To understand how the Economics theories are modified into business practice so as for firm development It helps to understand project proposal and also how they are framed
		Professional English For management-II	The primary goal of a management team the system. Providing growth and stability.

**Name of the Programme: Bachelor of Business Administration (BBA)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Specific Outcome(PSO):**

<b>PSO1</b>	Function effectively as a member, leader, individual or group in diverse environment.
<b>PSO2</b>	Ability to conceptualize a complex issue into a coherent written statement and oral presentation and to communicate effectively on
<b>PSO3</b>	Providing an opportunity for the students to gain practical exposure towards the workplace and make them industry ready.

**Name of the Programme: Bachelor of Business Administration (BBA)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Outcome(PO):**

<b>PO1</b>	To develop appropriate skills in the students so as to make them competent and provide themselves self-employment
<b>PO2</b>	To inculcate Entrepreneurial and Managerial skills
<b>PO3</b>	To work well in teams, including virtual settings
<b>PO4</b>	To understand finance and other core business content

**COURSE OUTCOME**

**Name of the Programme: Bachelor of Business Administration (BBA)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2022-2023 onwards**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
<b>III</b>	Core - V	Marketing Management	Understand various factors of marketing environment Apply the basic concepts of marketing <u>Understand recent trends in marketing</u>
	Core - VI	Financial Management	Understand the fundamentals of finance. Recognize the importance of financial management knowledge
	Core - VII	Human Resource Management	Analyze the process of Job analysis and its importance as a foundation of human resource management practice.
	Core - VIII	Production And Materials Management	Understand the production function Identify the need for production management
	SBEC-I	Fundamentals of Insurance	To analyze the sources of risk in Insurance policies. To apply the management techniques for avoidance of risk. <u>Use Forward Contract and Futures Contract to hedge the unsystematic Risk.</u>
	Allied-III	Managerial Economics	To analyze economics problems of business and suggest solutions and help the managers in decision makings.
	NMEC - I	ED	To develop the entrepreneurial abilities among the students and help them to start their ventures to become successful entrepreneurs.
	CORE: IX	Management Information System	Understand various concepts of MIS Apply MIS for the decision making process <u>Know the roles of functional MIS</u>
	Core - X	Cost Accounting	Understand the fundamentals of cost accounting Recognize the costing methods

IV	Core - XI	Business Law	Legal insight will be established in the business practices according to the situation of changing environment
	Core - XII	Taxation	Students can understand the basic Taxation in India. Sales Tax Act related Central Government and State Government To promote a complete understanding of Taxation, Tax policy, Tax Policy and laws and their implications for business practices in India
	Allied - II	Money banking and global business	Understand several key models and concepts of monetary economics and banking theories. Understand simple articles concerned with monetary economics and banking theory.
	SBEC-II	In plant Training -(Viva - Voce)	To enable the students to acquaint himself / herself with the procedure, practice and working of companies by having minimum period of 2 Weeks of Training in order to get the practical exposure in the field of Management Studies
	NMEC - II	Human Resource Management	To make aware the students about concepts, forms of theories, approaches of HRM and their evolving dynamics in the emerging business scenario

**Name of the Programme: Bachelor of Business Administration (BBA)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2019-2020 onwards**

**Programme Specific Outcome(PSO):**

<b>PSO1</b>	Ability to define, analyse the solutions for different business problems and using logical reasoning patterns for evaluating
<b>PSO2</b>	Provides verbal, reasoning, Data Interpretation, Quantitative and communication skill to solve specific business problems and
<b>PSO3</b>	Apply ethical principles and commitment towards professional ethics and responsibility.

**Name of the Programme: Bachelor of Business Administration (BBA)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2019-2020 onwards**

**Programme Outcome(PO):**

<b>PO1</b>	To provide adequate basic understanding about Management Education among the students
<b>PO2</b>	To prepare students to exploit opportunities being newly created in the Management Profession
<b>PO3</b>	To train the students in communication skills effectively

**COURSE OUTCOME**

**Name of the Programme: Bachelor of Business Administration (BBA)**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
V	Core - X	Business Policy and Strategy	To provide students with the fundamentals of Business Policies and strategic management in a comprehensive fashion and relate its concepts and techniques to the Indian as well as International Context.
	Core - XI	Operations Research	Understanding of the practical applications of the subject. Development of analytical thought process to help develop modeling
	Core - XII	Cost Accounting	Imbibe conceptual knowledge of cost accounting. Understand the significance of material management system To study the concept of labour cost Understand the concept of Overheads and machine hour rate. To learn the concept of process costing.
	Core - XIII	Fundamental of Research Methodology	To convert business problems into research problem and design research accordingly. To identify correct statistical tools to solve problem in hand. To write short research report.
	Core - XIV	Management Information System	Relate the basic concepts and technologies used in the field of management Compare the processes of developing and implementing information systems Outline the role of the ethical, social, and security issues of information systems
	Elective - II	Service Marketing	To explain the differences between goods and services and the resulting challenges and opportunities for service businesses To introduce the expanded marketing mix for Services and the philosophy of customer focus for services
	Core - XV	Business Environment	To learn about global trends that influence our business environment and the living conditions and how different management systems and approaches that are used around the world to manage the business environment

**VI**

Core - XVI	Financial Institutions and Services	To provide the student with complete understanding of Indian financial markets, institutions and intermediaries. To equip the student with understanding of different financial instruments and their application in real life scenarios
Core-XIX	Computer application in business	provide commerce students with essential skills and tools for data management, analysis, communication, and decision- making
Core - XVII	Entrepreneurial Development	To develop the entrepreneurial abilities among the students and help them to start their ventures to become successful entrepreneurs. The students will become more capable in selfemployment
Core - XVIII	Project Work-Viva-voce	To get familiar in one Management concepts by preparing and submitting a project report titled in the field of Management studies (Finance, HR, Marketing, Production)
Elective - III	Retail Marketing Management	Gain a conceptual understanding of the various retail concepts. Build student appreciation of current trends, newer ways to sell and communicate with customer, greater emphasis on environment and social responsibility of retail sector, use of technology and analytical methods in retailing

# DEPARTMENT OF COMMERCE

**Name of the Programme: Bachelor of Commerce (B.Com)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Specific Outcome(PSO):**  
**After completion of the programme, the graduates will be able to**

PSO1	The students should possess the knowledge, skills and attitudes during the end of the B.com degree course
PSO2	By virtue of the training they can become an Manager, Accountant , Management Accountant, cost Accountant, Bank Manager, Auditor, Company Secretary, Teacher, Professor, Stock Agents, Government jobs etc.,

**Name of the Programme: Bachelor of Commerce (B.Com)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Outcome(PO):**  
**Upon completion of the degree requirements, students will be able to**

PO1	Accounting knowledge: Apply the knowledge of mathematics, Social science, accounting fundamentals, and accounting specialization to the solution of complex accounting & management problems.
PO2	Problem analysis: Identify, formulate, research literature, and analyze socio – economic problems to arrive at substantiated conclusions using first principles of statistics, natural and social sciences.
PO3	Design/development of solutions: Design solutions for economic problems and design case study, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	Conduct investigations of complex problems: Use research – based knowledge including design of tools, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
PO5	The accountant and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional accounting practice.
PO6	Communications: Communicate effectively with the accounting professional community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give and receive clear instructions.
PO7	Project management and finance: Demonstrate knowledge and understanding of management principles and apply these to one’s own work, as a member and leader in a team. Manage project in multidisciplinary environments.
PO8	Life – long learning: Recognize the need for and have the preparation and ability to engage in independent and life – long learning in the broadest context of
PO9	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the accounting practices.

## COURSE OUTCOME

**Name of the Programme: Bachelor of Commerce (B.Com)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

SEMESTER	STUDY COMPONENTS	COURSE OUTCOME	
I	Core - I	Principles Of Accountancy	Provide a basic knowledge about Basic Concepts Fundamentals of Book Keeping accounting concepts
		Understand use the Final accounts of a sole trading concern.	
		Understanding the Final accounts of Non- trading concerns	
		To have knowledge on preparation Bank Reconciliation statement and Royalties	
	Core - II	Business Communication	To have knowledge on preparing Depreciation Accounts
			Understand the essentials of effective business letters
			Draft an application for employment
			Gain Practical knowledge to face an Interview
	Core - III	Professional English For Commerce & Management - I	Developing writing skills towards secretarial correspondence
			Exploring a practical knowledge for bank & Insurance Correspondence.
			Recognise their own ability to improve their own competence in using the language
			Use language for speaking with confidence in an intelligible and acceptable manner
	Allied - I	Business Economics	Understand the importance of reading for life
			Read independently unfamiliar texts with comprehension
			Understand the importance of writing in academic life
			Understand the basic economics and business economics
Core - IV	Financial Accounting	Understand about various methods of demand forecasting. Basic idea of demand and the concept ‘elasticity of demand’	
		understand the concept of production	
		Get the idea on Break Even Point in profit planning of a firm	
		Get the knowledge over various types of market structure and their features	
			Have a knowledge on preparing Branch and Departmental Accounts
			Have kill in the procedure for preparing of accounts from incomplete Records
			Learn about the partnership Accounting

II	Core - IV	Business Management	Understand basic concepts and importance of management, including the principles, functions of management and contributions of management experts Gain knowledge on the conventional theoretical aspects and emerging trends and developments in management Familiarize themselves on internal and external environment and its impact on the growth and survival of organizations Critically analyze role of planning, organizational structures, directing and controlling techniques in the achievement of organizational goals
	Core - IV	Professional English For Commerce & Management - II	Students will be enabled to understand the basic objective of the course by being acquainted with specific dimensions of communication skills i.e. Reading, Writing, Listening, Thinking and Speaking Students will apply it at their work place for writing purposes such as Presentation/official drafting/administrative communication and use it for document/project/report/research paper writing. Students will be made to evaluate the correct & error-free writing by being well versed in rules of English grammar & cultivate relevant technical style of communication & presentation at their work place & also for academic uses. Students will apply it for practical and oral presentation purposes by being honed up in presentation skills and voice-dynamics.
	Allied - II	Indian Economy	Develop ideas of the basic characteristics of Indian economy, its potential on natural resources Understand the importance, causes and impact of population growth and its distribution, translate and relate them with economic development Understand agriculture as the foundation of economic growth and development Understand the concept of industrialization understand the importance of planning undertaken by the government of India
	Core - V	Business Law	Understanding the legal Environment of business Understand the Basic Knowledge of the business Transactions Elucidating Communication effectively by using standard business and legal Terminology
III	Core - VI	Corporate Accounting – I	Understanding the concept of Equity Shares Issue at Par, at Premium and at Discount & Forfeiture and Re-issue Learning about the provisions relating to redemption of Preference shares Various Methods of Redemption, Writing off Discount on Redemption of debentures Ability to Valuation of Goodwill and shares & Learning about methods of Valuation of shares To learn the Pre -incorporation, Post - incorporation & Preparation of Final accounts of companies
	Core - VII	Banking Theory Law & Practice	Have better understanding about banks and its relationship with customers Know complete knowledge on cheques, material alteration, crossing and endorsements Have understanding of rights, duties of payment and collecting Bankers Understand general principles of lending, Types of advances in business Have knowledge on the concept, evolution of banking
	SBEC - I	Financial Market	Know the functions and importance of Financial Market. To Understand the level of Investor's and guidelines issued by SEBI. To learn the functions of Credit rating agencies. To Understand the trade practices followed in the Indian Financial market. To realise the Stock Price movement and Indian economy system.
	SBEC - II	Ms Office Practical – I	Provide working Knowledge on Word Processing. Provide exposure to various utilities of spreadsheet and Excel Provide knowledge on the creation of power point presentation
	NMEC - I	Marketing	The students will be able to perceive the concept of marketing function of marketing and sales promotion technique. Understanding and knowledge of Introduction of Marketing. To have knowledge on Marketing Function. Understanding the Standardisation, Grading, MIS. To have knowledge on Product Planning and Development. To have knowledge on Product Life Cycle – Product Diversification
	Core - VIII	Company Law	Know the concept of joint stock companies and their classification Understand the procedure for the incorporation of companies Know about important documents of companies such as memorandum, articles, prospectus Know the management of companies, appointment, rights, duties of directors and MD Understand the nature and matters discussed in different types of meetings

IV	CORE IX	Corporate Accounting - Ii	Know about the companies all accounts Get the knowledge of banking / insurance company Get the knowledge of Holding Company Get the knowledge of Amalgamation, Absorption and Reconstruction
	CORE X	Principles Of Marketing	Understanding and knowledge of Introduction of Marketing. To have knowledge on Marketing Function Understanding the Standardisation, Grading, MIS To have knowledge on Product Planning and Development and Product life cycle. To have knowledge on Global Marketing- E-Marketing- Tele Marketing- Green Marketing- Online Marketing- Neuro Marketing
	SBEC - III	Project Methodology	After the successful completion of the course the students come to know to carry out the project work. Identify project goals, constraints, deliverables, performance criteria, control needs, and resource requirement in consultation with stake holders.
	CORE X	Tally – Practical Ii	Create a company using tally and functions keys and short cut keys. Enter ledger accounts and various vouchers with TALLY ERP.9 Work with inventory records Create cost centre and cost category
	NMEC - II	Human Resource Management	To develop the understanding of the concept of human resource management and to understand its relevance in organizations. To develop necessary skill set for application of various HR issues To analyse the strategic issues and strategies required to select and develop manpower resources To integrate the knowledge of HR concepts to take correct business decisions

**Name of the Programme: Bachelor of Commerce (B.Com)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2019 onwards**

**Programme Specific Outcome(PSO):**

PSO1	Solve real time problems by applying domain knowledge and problem solving skills
PSO2	Acquire good employability skills which will ensure exceptional career opportunities in IT companies.
PSO3	Purse higher education in the field of Computer Science/Applications

**Programme Outcome(PO):**

PO1	To understand the fundamental concepts of computer system, including hardware and software
PO2	To design and analyze precise specifications of algorithms, procedures and interaction behaviours
PO3	To apply the appropriate technologies, skills and tools in various fields of computer science
PO4	To analyze impacts of computing on individuals, organization and society

**COURSE OUTCOME**

**Name of the Programme: Bachelor of Commerce (B.Com)**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
V	CORE XI	Cost Accounting	Explain Cost accounting systems Explain main manufacturing cost elements Makes Material Issue Makes Cost allocation Calculates production cost accounting to the process costing
	CORE COURSE XII	Auditing	Understand the basic principles and their application of auditing. Gain Practical knowledge on Internal Check as regards cash payments of various items. Draft an Audit Report on behalf of a Public Limited Company Draft an Audit Program Record the verification procedure with respect to any one Fixed Asset.
	CORE XIII	Income Tax Law & Practice - I	Examine the basic concepts of schedules of rates of tax, tax liability, and penalties and prosecution. Explain the total taxable income of an Assessee Apply and practice the computation of total income.
	CORE XIV	Information Technology in Business	Understand th basic principles and their application of information technology Gain practical knowledge on internet access Familiarize themselves on e-commerce and mobile commerce
	ELECTIVE I	Project Work	To know about Identifying the title of the project. Gain Knowledge above how collection of data Ability to interpret the collection of data To develop give suggestions to company How prepare Questionnaaire
	ELECTIVE II	Office Organisation	To understand the concepts related to business Demonstrate the roles, skills and functions of management Analysis effective application of PPM knowledge to diagnose and solve organizational problem and develop optimal managerial decisions.
	ELECTIVE III	Industrail Law - I	Understand the basic principles and their application of labour legislations. Student becomes familiar about factories Act and workmen related issues and benefits

	ELECTIVE IV	Campus to Corporate	To enable the students understand the corporate demand, competition and employment opportunities Employee happiness, lower labour turn-over, employee performance and loyal to company. To empower the students in oral and written communication in the modern business world. To make the students understand the term of business communication importance and effectiveness of Business correspondences.
VI	CORE XV	Management Accounting	Provide a basic knowledge about management accounting concepts Understand use the different types of ratios Describe the method of preparing the cash flow statement as per AS-7 and fund flow statement Understand the basic concept of budget and its type Understand the basic concept of marginal cost
	CORE XVI	Entrepreneurial Development	Understanding and knowledge of Introduction of an Entrepreneur Characteristics of entrepreneur ,classification of entrepreneur. To have knowledge on Problems of Entrepreneurs – Women entrepreneurs Understanding the Business idea generation – identification of business opportunities. To have knowledge on MSME- Meaning- Features- Role- Problems- Rural entrepreneurship To have knowledge on Financial assistance and service
	CORE XVII	Income Tax Law & Practice - II	Familiarize the concept of capital gain Enlighten the concept of income from other source Discuss the concept of Tax liability of individual and firms. To know the concept of clubbing and set off and carry forward of losses Enlighten the concept of income tax authorities, appeals and revisions
	CORE XVIII	Commerce Practicals	Understanding and knowledge of Preparation of of invoice, receipts, vouchers . To have knowledge on Drawing, endorsing and crossing of cheques To have knowledge on Filling up of application forms admission in co-operative societies deposit challan and Jewel loan application To have knowledge on Preparation of agenda and minutes of meetings To have knowledge on Filling up of an application form for LIC policy, filling up of the premium form
	ELECTIVE - I	Fundamentals of Insurance	Understanding and knowledge of Introduction to Insurance Know complete information about life insurance policies and its various kinds and Nomination. To have knowledge on Fire and Marine Insurance. To have knowledge on Miscellaneous Insurance. Know basic information on LIC of India Procedure for becoming an Agent.
	ELECTIVE - II	Secretarial Practice	To provide the Students an insight about Company Secretarial Practices To make the learns understand the role of company secretary towards Company's statutory provisions, rules and regulations The students will be able to familiarize the duties of company secretary relating to meeting, minutes and resolution.
	ELECTIVE - III	Industrial Law - II	Understand the basic concepts on wages, bonus and gratuity of employees working in companies. Student becomes familiar about workmen related issues and benefits. Girls' student aware about the provisions relating to maternity leaves and benefits.
	ELECTIVE - IV	Customer Relationship Management	The students will be able to understand the concepts of CRM To examine the principles CRM To study current trends and role of CRM in Banking.

<b>Name of the Programme: Master of Commerce (M.Com)</b>	
<b>For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards</b>	
<b>Programme Specific Outcome(PSO):</b>	
PSO1	The students should possess the knowledge, skills and attitudes during the end of the M.com degree course
PSO2	By virtue of the training and curriculum, they can become an Managers, Accountants , Cost Accountants, Bank Managers, Auditors, Company Secretaries,
<b>Programme Outcome(PO):</b>	
PO1	Critical Thinking and Professional Development: Emphasizing the critical thinking and analytical skills on the basis of subject expertise to equip the students into
PO2	Problem Solving: Exploring the subject expertise to understand the complex problems and executing the resolving strategy through effective networking among
PO3	Effective Communication: Ability to perform the knowledge dissemination through the effective oral/ verbal communication, report writing and presentations
PO4	Multi-Disciplinary Exploration: Value added exposure to the students to work on the multi-disciplinary platform
PO5	Research and Development (R&D) Capability: Ability to pursue research and development (R&D) careers in academic and industrial sectors on the core/ inter
PO6	Skill Development, Employable and Entrepreneurial Abilities: Strengthening the skill components of the students and enabling their lifelong learning ability and

**COURSE OUTCOME**

Name of the Programme: Master of Commerce (M.Com)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards

I	Core - I	Marketing Management	Understanding the Marketing concepts and its evolution. Analyse the market based on segmentation, targeting and positioning Know the consumer behavior and their decision making process. Make decisions on product, price, promotion mix and distribution Understand the rural markets and the contemporary issues in markets.
	Core - II	Accounting for Managerial Decision	Know about Tools and Techniques of Management Accounting. Learning about the Advantages & Limitations of Ratio Analysis Understanding the concept of Funds and Flow of Funds.
	Core - III	Financial Management	To learn the Role and functions of Financial Management Learn about the Cost of Capital and its importance. Understanding the concept of Leverages and Theories of Capital Structure. Dividend Theories, Dividend policy.
	Core - IV	Modern Banking	To learn the context of banking: the financial system. To Understand the principles of banking. Elucidate the broad functions of banks. Analyse and explain the basic raison d'etre for banks. Describe the components of the balance sheets of banks. Elucidate the liability and asset portfolio management "problem" of banks.
	Elective - I	Organisational Behaviour	To studying the concept of organizational behavior To study the theories of personality To learn the concept of motivation To Understand the Concepts of group, types of group and group behavior To gain the Knowledge about interpersonal behavior, principles and developing interpersonal behavior
	Elective - I	Business Environment	The course will enhance knowledge of the environment in which businesses operates Student will understand the economic, operational and financial framework with particular application to the transaction of insurance business It will result in sharpening the analytical faculty of the student, by highlighting an integrated approach to the functioning aspects of the Indian business environment
	Core - V	Advanced Cost Accounting	Identify various Classifications of cost and Elements of cost know the methods of accounting followed for inventory maintenance and issues of stocks from the stores. know the cost ascertainment technique for labour cost including various incentive plans Learn the appropriate and apportionment of overheads for a department and calculation of machine hour rate Understand the preparation of Job, Batch , Contract costing and process cost accounting and report.
	Core - VI	Investment Analysis and Portfolio Management	To study the concept of investment, speculation, gambling, investment process. To understand the various of investment alternatives and strategies. Lime lighting the fundamental analysis of economic, industry and company analysis To gain the knowledge about Technical analysis, types of chart and various theories To know the concept of Portfolio anaysis and management
	Elective-II	Financial Markets and Institutions	Describe the dimensions of performance and risk relevant to financial firms and Calculate contemporary measures of financial measures of performance and risk Describe contemporary managerial risk management oversight processes and Explain how the financial services component industries (insurance, banking, securities, real estate and financial planning) interact. Design hedging strategies to manage market risks (e.g., currency, commodity, economic and political) Evaluate the economic environment and the impact of governmental economic policieson consumers and financial institutions Describe the impact that financial innovation, advances in technology, and changes in regulations has had on the structure of the financial firms
	Elective-II	Export - Import Management	To introduce students to the world of financial services To enrich students understanding of the fundamental concepts and working of financial service institution To equip students with the knowledge and skills necessary to become employable in the financial service industry To differentiate between fund based and fee based and financial activities of the Indian financial system
Add on Course	Internship Training Programme	Students able to construct the company profile by compiling the brief history, management structure, products or service offered Students is able to determine the challenges and future potentials for his/her internship organization in particular and the sector in general	

			For his/her organization of internship, the students is able to assess its strength, weakness, opportunities and threats (SWOT)
III	Core - IX	Research Methodology	Know the concept of business research and its types CO2 : Understand the process of identification, selection and formulation of research problem Know the need and sources of collection of primary and secondary data. Understand the different methods of data collection and techniques. Understand the methods and techniques of sampling and steps in sampling.
	Core - X	Advanced Corporate Accounting	Learn the accounting knowledge about Equity shares, Preference Shares and Debentures. Understand the accounting concept of Final Accounting Acquire the accounting concept of amalgamation, absorption, Internal and External Reconstruction To motivate the students to understand the concept of Liquidator's Final Statement and Holding Company To remember the accounting for Banking and Insurance companies
	Core - XI	Human Resource Management	To study the objectives and functions of Human resource management To understand the concept of Human resource planning and HRP process and job analysis Limelighting the selection process, recruitment and training development To gain the knowledge about discipline, Act of discipline and Grievances To know the concept of organisational conflict and Leadership theories
	Core - XII	Income Tax and Planning	Introduce the basic concept of income tax and exempted incomes. Familiarities the provisions of salary income and house property income Discuss about income from business and profession also know the concept of capital gains Understand the concept of income from other sources, set off and carry forward losses To know deductions form GTI, Clubbing of income & Assessment of Individual
	Elective-III	Resource Management Techniques	To study the objectives and functions of Human resource management To understand the concept of Human resource planning and HRP process and job analysis Lime lighting the selection process, recruitment and training development To know the concept of organizational conflict and Leadership theories
	Elective-III	Retail Marketing	Understand the overview of retail marketing & retail Consumers Have knowledge on retail pricing & retail Locations. Know about various Retail Formats Learn Supply Chain management & E-Retailing Explain Retail Environment and Merchandise management
IV	Core - XIII	Goods and Service Tax	Understand the concept of indirect taxes Understand the Nature, scope and other concepts of CENVAT and MODVAT also about VAT UNDERSTAND CUSTOMA act Understand the concept Central sales Tax Act Know about GST and apportionment of GST between central and states
	Core -XIV	Services Marketing	Know in detail about the Service Sector and apply the 7 P's of Service Marketing. Understand the Consumer Behaviour in Service Sector Getting indepth knowledge about Service marketing concepts Getting acquainted with the utilities in Service marketing Sector Set standard and measure service quality and productivity
	Core -XV	Project Work	To know about Identifying the title of the project Gain Knowledge above how collection of data Ability to interpret the collection of data To develop give suggestions to company How prepare Questionnaire
	Elective-IV	Insurance and Risk Management	To studying the concept of objectives, principles and characteristics of insurance To understand the Indian insurance institute To know the overview of the risk management To Lean the concept of Tourism marketing Gain the knowledge about risk management and control
	Elective-IV	Strategic Management	To expose students to various perspectives and concepts in the field of strategic management The course would enable the students to understand the principles if strategy formulation, implementation and control in organization. To help students develop skills for applying this concepts to the solution of business problems. To help students master the analytical tools of strategic management.

EDC	Business Communication	Understand the essentials of effective business letters.
		Draft an application for employment.
		Gain Practical knowledge to face an Interview.
		Developing writing skills towards secretarial correspondence
		Exploring a practical knowledge for bank & Insurance Correspondence.
EDC	Principles of Marketing	Understanding and knowledge of Introduction of Marketing.
		To have knowledge on Marketing Function
		Understanding the Standardisation, Grading, MIS
		To have knowledge on Product Planning and Development and Product life cycle.
		To have knowledge on Global Marketing- E-Marketing- Tele Marketing- Green Marketing- Online Marketing- Neuro Marketing
EDC	Principles of Accounting	Provide a basic knowledge about Basic Concepts Fundamentals of Book
		Keeping accounting concepts
		Understand use the Final accounts of a sole trading concern.
		Understanding the Final accounts of Non- trading concerns
		To have knowledge on preparation Bank Reconciliation statement and Royalties
		To have knowledge on preparing Depreciation Accounts



**Name of the Programme: Bachelor of Commerce (Computer Applications)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Specific Outcome(PSO):  
After completion of the programme, the graduates will be able to**

<b>PSO1</b>	Apply domain knowledge and fundamentals of Commerce (Computer Applications), Accounting and Finance to solve real time problems.
<b>PSO2</b>	Apply accounting concepts & theories to enter the work environment with confidence & strength.
<b>PSO3</b>	Prioritize & work in solving dynamic challenges of the business environment in the field of Commerce in computer Applications.

**Name of the Programme: Bachelor of Commerce (Computer Applications)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Outcome(PO):  
Upon completion of the degree requirements, students will be able to**

<b>PO1</b>	Enables learners to get theoretical and practical exposure in the commerce sector which includes Accounts, Commerce, Marketing, Management, Economics, Environment etc.
<b>PO2</b>	Develops communication skills and build confidence to face the challenges of the corporate world.
<b>PO3</b>	Enhances the capability of decision making at personal and professional levels.
<b>PO4</b>	Makes students industry ready and develop various managerial and accounting skills for better professional opportunities.

**COURSE OUTCOME**

**Name of the Programme: Bachelor of Commerce (Computer Applications)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

<b>SEMESTER</b>	<b>STUDY COMPONENTS</b>	<b>COURSES</b>	<b>COURSE OUTCOME</b>
<b>I</b>	Core - I	Principles of Accountancy	Acquire the knowledge in accounting, system of maintenance of accounts, journal, ledger, bill of exchange, account current, average due date and bank reconciliation statement.
			Familiarize and understand the basic accounting concepts and conventions, preparation of subsidiary books and final accounts, account of Consignment, Joint venture and non-trading concerns.
			Develop the application skills to create adjusting journal entries in rectifying errors, preparation of entries in bill of exchange, consignment and joint venture, receipts and
			Develop the analytical skills in accounting equation, preparation of trial balance and suspense account, normal loss in consignment.
			Evaluate declare commission, normal and abnormal loss, value of unsold stock in consignment account and familiarize the financial position of sole proprietor through final accounts
	Core - II	Business Communication	To be familiar with the complete course outline/Course Objectives/Learning Outcomes/Evaluation Pattern & Assignments
			To participate in an online learning environment successfully by developing the implication-based understanding of Paraphrasing, deciphering instructions, interpreting guidelines, discussion boards & Referencing Styles.
			To demonstrate his/her ability to write error free while making an optimum use of correct Business Vocabulary & Grammar.
			To distinguish among various levels of organizational communication and communication barriers while developing an understanding of Communication as a process in an organization.
Core - III	Professional English for Commerce and Management - I	Recognise their own ability to improve their own competence in using the language	
		Use language for speaking with confidence in an intelligible and acceptable manner	
		Understand the importance of reading for life	
		Read independently unfamiliar texts with comprehension	
		Understand the importance of writing in academic life <input type="checkbox"/> Write simple sentences without committing error of spell	

II	Core - IV	Financial Accounting	<p>Acquire the basic knowledge of the terms such as, single entry system, statement of affairs, departmental accounts, inter departmental transfer, branch accounting, stock and debtors system, depreciation, hire purchase and installment purchase, down payment.</p> <p>Understand the features of single entry system, difference between single entry and double entry system, need for departmental accounts, basis for allocation of expenses.</p> <p>Familiarizing the methods of preparation of single entry system of accounts, inter-department transfer at cost or selling price, preparation of branch accounts.</p> <p>Develop analytical skills in single entry system of accounts, department trading and profit and loss account and balance sheets, stocks and debtors system and final accounts system and hire purchase trading account.</p> <p>Evaluate the cost of departmental purchase, consolidated final accounts and default and repossession of goods under hire purchase system.</p>
	Core - VI	Professional English for Commerce and Management - II	<p>Students will be enabled to understand the basic objective of the course by being acquainted with specific dimensions of communication skills i.e. Reading, Writing, Listening, Thinking and Speaking</p> <p>Students will apply it at their work place for writing purposes such as Presentation/official drafting/administrative communication and use it for document/project/report/research paper writing.</p> <p>Students will be made to evaluate the correct &amp; error-free writing by being well-versed in rules of English grammar &amp; cultivate relevant technical style of communication &amp; presentation at their work place &amp; also for academic uses.</p> <p>Students will apply it for practical and oral presentation purposes by being honed up in presentation skills and voice-dynamics.</p>
III	Core - V	Business Law	<p>Students would learn the basics of Laws governing commercial contracts and nuances of competency to contract, rules of Consideration and Objects of Contracts with case laws and illustrations.</p> <p>Students would learn the concept of Consent &amp; Free Consent, different types of Agreements and Contracts, different Modes of discharge of Contracts, Breach of contracts and remedies for the aggrieved parties.</p> <p>Students would learn the rules regarding the Contract of Indemnity &amp; Guarantee, Contract of Bailment, Contract of Pledge and Contract of Agency and types of Agents.</p> <p>Students would learn the rules regarding the Contract of Sale, Distinction between Sale &amp; Agreement to sell, Condition &amp; Warranty</p> <p>Students would learn various provisions related to The Negotiable Instrument Act, 1881 with Amendment Act, 2015.</p>
	Core - VI	Corporate Accounting - I	<p>Acquire the knowledge in company accounts such as meaning of a company, characteristics of a company, definition of shares, debentures, underwriting and goodwill</p> <p>Understand the accounting treatment in issue of shares at par premium and discount, issues of debenture, managerial remuneration, calculation of goodwill and shares and liquidator's statement of affairs.</p> <p>Develop the application skills to computation of pro-rate allotment, redemption of preference shares, profit and loss account and preparation of balance sheet of companies (new format).</p> <p>Familiarize the analytical skills in corporate accounting, calculation of underwriting commission, redemption of debentures in sinking fund method, valuation of shares and liquidators final statement.</p>
	Core - VII	Fundamentals of Computer and Tally	<p>Understand the concept of input, output and software of computer in detail</p> <p>Get the knowledge of tally.</p> <p>To enable the meaning and basic components of a computer system.</p>
	SBEC - I	Financial Market	<p>Apply concepts relevant to financial markets and financial institutions, such as the flow of funds, levels of interest rates and interest rate differentials, to current events or topical issues.</p> <p>Determine and analyze the appropriate measures of risk and return for various financial instruments.</p> <p>Identify and evaluate the role symmetric versus asymmetric information plays in the structure and operation of the financial system information.</p> <p>Evaluate empirical evidence of market performance, and contrast it with theories of market performance.</p> <p>Research and analyze specific problems or issues related to financial markets and institutions.</p>
	SBEC - II	Marketing	<p>The students are able to acquire knowledge about marketing and skill in the field of marketing.</p>

IV	Core - IX	Corporate Accounting - II	Acquire the knowledge in company accounts such as meaning of a company, amalgamation of a company. Understand the accounting treatment in amalgamation, liquidator's final statement of accounts, preparation of revenue account, calculation of purchase consideration and preparation of electricity company. Develop the application skills to calculate profit and loss account, consolidated balance sheet of holding companies, preparation of balance sheet of banking and insurance companies. Familiarize the analytical skills in corporate accounting, calculation of managerial remuneration, minority interest, classification of bank advances. Evaluate the techniques of valuation of consolidated balance sheet of holding company, bank accounts, insurance company accounts and electricity company accounts.
	SBEC - III	Project Methodology	Understand the current state of the project management profession. Apply project management tools and techniques. Explore the appropriate methods to initiate, plan, execute, control and close projects
IV	SBEC - IV	Human Resource Management	Understand and apply Human Resource Management Perspective Ability to recruit Select and interview job candidates Ability to implement the practices related to employee integration Ability to Draft HR planning
III	NMEC	Quantitative Aptitude - I	To enhance the problem-solving skills. To improve the basic mathematical skills to help students who are preparing for any type of competitive examinations. To develop knowledge in practicing quantitative aptitude objective type question and answer in individual for competitive exams, entrance exams and interviews.
IV	NMEC	Quantitative Aptitude - II	To enhance the problem-solving skills. To improve the basic mathematical skills to help students who are preparing for any type of competitive examinations. To develop knowledge in practicing quantitative aptitude objective type question and answer in individual for competitive exams, entrance exams and interviews.

**Name of the Programme: Bachelor of Commerce (Computer Applications)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2019 onwards**

**Programme Specific Outcome(PSO):**

**After completion of the programme, the graduates will be able to**

PSO1	Graduates are prepared to be employed in banking sector, reputed companies by providing expected domain Knowledge
PSO2	Alumnus holder are provided with practical training, hands-on to meet the industrial needs.
PSO3	Graduates are motivated in career and entrepreneurial skill development to become global leaders

**Programme Outcome(PO):**

**Upon completion of the degree requirements, students will be able to**

PO1	To develop innovative ideas and. to work in teams to accomplish a common goal.
PO2	To apply the learners venture into managerial positions, accounting areas, Banking sector, Auditing, Teaching etc.
PO3	Apply accounting concepts & theories to enter the work environment with confidence & strength.
PO4	Prioritize & work in solving dynamic challenges of the business environment in the field of Commerce in computer Applications.

**COURSE OUTCOME**

**Name of the Programme: Bachelor of Commerce (Computer Applications)**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
V	Core - XI	Cost Accounting	Understand various costing systems and management systems Analyze and provide recommendations to improve the operations of organizations through the application of Cost and Management accounting techniques Evaluate the costs and benefits of different conventional and contemporary costing systems Analyse the use of List Boxes and Combo boxes. Differentiate methods of schedule costs as per unit of production Differentiate methods of calculating stock consumption
	Core - XII	Principles and Practice of Auditing	Acquire the basic knowledge of auditing, objectives of auditing, audit program, audit note book, working paper, voucher, vouching, verification, valuation, reserves & provisions, audit report & investigation Understand the importance and limitations of the auditing, internal control, internal check, various modes of appointment of an auditor, qualities of an auditors, qualification and disqualification of an auditor Develop the application skills related to vouching of cash book, trading and impersonal ledger accounts, verification & valuation of assets and liabilities Develop the analytical skills in conducting share capital and share transfer audit, Vouching Vs Verification Vs Valuation, provisions of companies act regarding investigation Evaluate the methods of depreciation, Rights, duties & liabilities of an auditor, various types of auditing.

	Core - XIII	Income Tax Law & Practice - I	<p>Acquire the knowledge about the basic principles and concepts of Income tax.</p> <p>Understand the rules and provisions of income tax under five heads of income namely, Income from Salaries, Income from House Property, Profits and Gains of Business or Profession, Capital Gains and Income from other sources</p> <p>Familiarize with the computation of income tax for an individual</p>
VI	Core - XV	Management Accounting	<p>Acquire the knowledge in management accounting in the aspects of scope, objectives, characteristics, functions, significance, limitations, ratio analysis, classification, need, importance of adequate working capital, disadvantages of excess or inadequate working capital</p> <p>Familiarize and understand the difference between financial and cost accounting versus management accounting, significance and limitations of financial statements</p>
			<p>Develop the application skills to estimation of working capital, computation of contribution, P/V ratio, break even sales and margin of safety in the process of decision-making.</p>
			<p>Analyzing the financial statement using short-term, long-term, profitability ratios, factors determining working capital requirements, fund flow and cash flow statements and break even analysis.</p>
			<p>Preparation of cash flow and fund flow statement to evaluate cash and fund flow of the company, managerial applications of marginal costing.</p>
	Core - XVI	Entrepreneurial Development	<p>Acquire the fundamental knowledge of entrepreneurs, entrepreneurship, micro, medium and small enterprises, project, finance and industries.</p> <p>Remembers the Requirements Analysis and Specification</p> <p>Understand the concept of Intrapreneurs, women entrepreneurs, and objectives of Entrepreneurship Development Programme, industrial estate, incentives, subsidies and growth strategies.</p> <p>Familiarize about Entrepreneurship Development Programme, steps involved in starting small industry, District Industries Centers (DIC), Export Credit Guarantee Corporation (ECGC), Small Industries Development Bank of India (SIDBI) and other financial institutions.</p>
Core - XVII	Income Tax Law & Practice - II	<p>Assess the income of an individual and the tax payable.</p> <p>Familiarize with the computation of income tax for an individual.</p> <p>Acquire the knowledge about the basic principles and concepts of Income tax.</p> <p>Analyse and apply the permissible exemptions and deductions from income under Income tax Act.</p> <p>Gain practical knowledge in computing tax liability of an individual and the filing of Income tax returns.</p>	
Core - XVIII	Commerce Practicals	<p>Enable the student to familiar with the forms and reports for business transactions through printed forms and electronic means.</p> <p>Student becomes a practitioner in modern offices like banks, insurance, manufacturing companies and professional practice of Income Tax and Goods &amp; Service Tax.</p> <p>Understand the conceptual and practical knowledge about electronic filing of returns.</p>	

# DEPARTMENT OF PHYSICS

**Name of the Programme: Bachelor of Physics B.Sc (PHY)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

## Programme Specific Outcome(PSO):

<b>PSO1</b>	Obtain knowledge of fundamentals and applications of Physics concepts.
<b>PSO2</b>	Creativity in design, setup, carryout the experiment and compare with Theoretical Prediction
<b>PSO3</b>	Acquire knowledge of synthesis, Characterization and Properties of Materials.
<b>PSO4</b>	Create proficiency in the analysis of complex Physical problems and the Use of mathematical or appropriate technique to solve them.
<b>PSO5</b>	Get knowledge and aware of handled the instruments in Physics Laboratories
<b>PSO6</b>	Function on multidisciplinary teams by working co-operatively creatively and responsibility as a member of a team.

**Name of the Programme: Bachelor of Physics B.Sc (PHY)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

## Programme Outcome(PO):

<b>PO1</b>	Acquire academic excellence with an aptitude for higher studies and research.
<b>PO2</b>	Apply appropriate scientific methods and modern technology to solve complex problems related to society
<b>PO3</b>	To understand and apply the principle of physics by doing related experiments in Physics
<b>PO4</b>	To promote analytical thinking and experimental skills in Physics
<b>PO5</b>	To build the department as a centre of excellence for imparting high quality scientific education at the undergraduate level
<b>PO6</b>	To train the students in communication skills effectively

## COURSE OUTCOME

**Name of the Programme: Bachelor of Physics B.Sc (PHY)**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
<b>I</b>	Core - I	PROPERTIES OF MATTER AND ACOUSTICS	To impart the basic concepts of properties of matter to make the students realize the concepts in day-to-day life.
			To study the basics of viscosity and its importance
			To learn and comprehend the concepts of surface tension.
			To enable the students to understand waves and oscillations to make them appreciate the flavour of physics in sound.
<b>II</b>	Core - II	MECHANICS	To enable the students to understand the Acoustic aspects of halls and auditoria and Ultrasonic.
			To know the fundamentals of projectile motion, the centre of gravity, SHM, Hydrostatics and Dynamics of rigid bodies.
			To provide the basis of the classical approach of Lagrangian Mechanics.
	Core - I	CORE PHYSICS PRACTICAL I	Learn to solve the problems in projectile motion.
			Understand the concepts of rigid body dynamics in terms of the moment of inertia.
<b>III</b>	Core - III	THERMAL AND STATISTICAL PHYSICS	Acquire knowledge of Lagrangian formulation in classical mechanics.
			Apply various physics concepts to understand Properties of Matter, set up experimentation to verify theories, quantify and analyse, able to do error analysis and correlate results
			To understand and apply the principle of physics by doing related experiments in properties of Matter, Optics, Electricity and Basic Electronics.
	ALLIED-I	ALLIED PHYSICS – I	Understand the Thermodynamical laws, potential and functions.
			Understand the statistical physics
			Derive the efficiency of Carnot's engine. Discuss the implications of the laws of Thermodynamics in diesel and petrol engines
<b>IV</b>	Core - IV	OPTICS AND SPECTROSCOPY	Able to analyze performance of thermodynamic systems viz efficiency by problems. Gets an insight into thermodynamic properties like enthalpy, entropy
			Interpret classical statistics concepts such as phase space, ensemble, Maxwell-Boltzmann distribution law. Develop the statistical interpretation of Bose-Einstein and Fermi-Dirac . Apply to quantum particles such as photon and electron
	ALLIED-II	ALLIED PHYSICS – II	Acquire the knowledge of various properties of matter.
			Help to understand the natural physical process.
			Explain the basic concept of temperature and specific heat mechanics.
	Core - II	CORE PHYSICS PRACTICAL II	Acquire knowledge of sound waves and their application.
			Describe the fundamentals of electricity and magnetism.
	Core - V	ELECTRICITY AND MAGNETISM	Understand the Geometry of lenses.
			Understand the Phenomena of optics.
			Attain adequate basic knowledge in spectroscopy.
These perceptions will help to understand the spectroscopic techniques.			
Core - VI	SOLID STATE PHYSICS	Understand the principles of the atom and nuclear models	
		Understand the structure and bonding in crystals	
		Familiar with the basic analog and digital electronic circuits.	
		To understand and apply the principle of physics by doing related experiments in properties of matter, optics, electricity, electromagnetism and basic electronics.	
		Construct circuits to learn about the concept of electricity, current, resistance in the path of current, different parameters that affect a circuit. Set up experiments, observe, analyse and assimilate the concept	
<b>IV</b>	Core - II	CORE PHYSICS PRACTICAL II	Demonstrate various optical phenomena principles, working, apply with various materials and interpret the results.
			To acquire in-depth knowledge of measuring instruments involving electric and magnetic fields.
			To study various magnetic properties of materials and their applications.
	Core - V	ELECTRICITY AND MAGNETISM	To give an idea of the fundamentals of electromagnetic induction
			Understand The Properties Of Electric And Magnetic Materials
			Acquire Experimental Skills To Construct Technically Useful Devices.
Core - VI	SOLID STATE PHYSICS	To learn crystal structures	
		To study diffraction of X-rays by crystal and defects in crystals	
		To know the basics of magnetism and superconductivity	
<b>IV</b>	Core - VI	SOLID STATE PHYSICS	To understand the electric and dielectric properties of non-metals

V	Core - VII	ANALOG AND DIGITAL ELECTRONICS	To gain the knowledge of thermal and electrical properties of solids.
			Providing an overview of the principles, operation and applications of special diodes.
			Introducing transistor and transistor biasing.
	ELECTIVE - I	ASTROPHYSICS	Providing an overview of the principles, operation and applications of special devices.
			Providing an overview of amplifiers, oscillators and their applications in different electronic fields.
			To make students acquire knowledge about Boolean algebra, logic circuits, designing counters and the basic concepts of memory and programmable logic device.
			This paper presents the fundamentals of the Astronomy and Astrophysics
	SKILL-I	COMPUTATIONAL METHODS AND PROGRAMMING IN – C	To enable the students to acquire knowledge of the Solar system, Stars and Galaxies
			To study the structure of the Sun and Earth
To know the origin of the Universe and its models			
VI	CORE- VIII	ATOMIC PHYSICS	To motivate the students to analyse the mystery of the Universe.
			The student will be acquainted with the importance of errors in computing
			The student will understand the various types of errors and their propagation in computing.
	CORE-IX	NUCLEAR PHYSICS	To Will acquire the knowledge of iterative techniques for a nonlinear function.
			Get exposure to the basics of the C programming language.
			To provide a coherent and concise coverage of the important atomic concept of physics
	CORE- X	QUANTUM MECHANICS AND RELATIVITY	To provide the basic concepts of the Quantum Vector atom model and Spectral lines analysis.
			Understand the concepts and potential of atomic physics.
			Understand the fundamentals of the formation of a nucleus, composition of a nucleus with their energy.
ELECTIVE – II	ELECTRONIC COMMUNICATION SYSTEMS	Acquire knowledge of the structure of the nucleus.	
		To understand the formation of the nucleus and its binding energy	
		students can analyse the energy released by the nucleus during the fission and fusion process.	
SKILL-V	HARDWARE SKILLS	Understand the basics concepts of quantum particles.	
		Apply the basic to construct and solve the particle equations in one dimension and three- dimension form.	
		Acquire knowledge of Relativity theory and its application in day to day life.	
SKILL-VI	MICROPROCESSOR AND ITS APPLICATIONS	To enable the students to understand the different types of communications and make them appreciate the favour of physics in communication	
		Students will be able to distinguish different sources and its principle of operation in the field of communication.	
		Students will able to demonstrate the different elements of the communication systems	
CORE LAB-III	CORE PHYSICS PRACTICAL - III	Acquire the knowledge of characteristics of an Instrumentation system.	
		Understand the functions of Electrical, Digital, Medical and Pollution Monitoring Instruments.	
		Know the various applications of the instruments.	
CORE LAB-IV	CORE PHYSICS PRACTICAL - IV	The student will be able to describe the general architecture and organization of 8085 microprocessors.	
		To Will be able to understand the various functional units and memory modes.	

**COURSE OUTCOME**

**Name of the Programme: Bachelor of Physics B.Sc (PHY)**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
V	Core - V	Electricity and Magnetism	Explain the concept of Coulomb's and Gauss' laws and their applications.
			To compare and relate electricity and magnetism.
	Core - VI	Basic Electronics	Interpret the concepts of magnetic induction and classify magnetic materials.
			To construct the basic equations of electro-magnetism and describe the propagation of electromagnetic waves.
			understand the concepts and analyze the analog and digital circuits for various applications.
	Elective - I	Mathematical Physics and Numerical Methods	To Examine real time problems, implement with analog and digital circuits by employing modern tools.
			Assess the need of modern society with professional ethics in electronics and recommend solutions for the same.
VI	Elective - II	Solid State Physics	To Design and construct the electronic project to plan an eco-friendly environment.
			To classify the types of matrices and determine Eigenvalues and Eigenvectors.
			To Attain knowledge of higher derivatives, definite integrals, first and second order differential equations, matrices and infinite series
	SBEC -III	Bio - Medical Instrumentation	To Apply various methods in solving problems.
			To Evaluate numerical solutions of ODE by numerical methods , PDEs, line, surface and volume integrals, series expansion,
			To Determine the structure factors of fundamental crystal lattices.
SBEC - IV	Digital Electronics	To Analyze the X-ray diffraction patterns of simple crystal structures.	
		To explain the theories underlying dielectric, optical, magnetic and superconductive properties	
		To classify the properties of semiconductors, dielectrics, optical, magnetic and superconductive materials.	
Core -VII	Atomic Physics	To explain the basic components of medical instruments.	
		To illustrate the usage of popular diagnostic instruments.	
		To describe the principles of imaging diagnostic instruments.	
Core - VIII	Nuclear Physics	To elucidate the functions of popular therapeutic instruments.	
		To Elucidate the digital logic and number systems.	
		To Design simple digital logic circuits.	
Core - IX	Quantum Mechanics and Relativity	To elucidate various timing circuits, D/A and A/D conversion techniques and memory devices	
		To classify and realize various sequential circuits.	
		To basic ideas of electrons, protons, and Properties and behaviour.	
Core - VIII	Nuclear Physics	To explain basic atomic models and their related phenomena.	
		To describe interaction of atoms with external fields, and spectrum of manyelectron atoms.	
		To explain the stability of the nucleus and the signatures of nuclear models.	
Core - IX	Quantum Mechanics and Relativity	Classify various types of nuclear decay processes;	
		To describe the functions and characteristics of detectors and accelerators	
		To illustrate the key features of nuclear fission and fusion and their applications	
Core - IX	Quantum Mechanics and Relativity	classify elementary particles based on various physical properties.	
		To describe the Schrodinger theory and the fundamental postulates of quantum mechanics and explain various quantum systems.	
		To apply the Schrodinger theory to study various one-dimensional quantum systems.	
Core - IX	Quantum Mechanics and Relativity	To apply the separation of variables technique to solve Hydrogen atom problem.	
		To analyse and compare the eigenvalues and eigen functions of various quantum systems.	
		To apply the separation of variables technique to solve Hydrogen atom problem.	

		To explain the special theory of relativity and its consequences.
Elective - III	Electronics and Communication	To understand the foundations of data communications.
		To appraise the classification and basic concepts of Switching and Routing
		Elucidate the design and applications of analog and digital electronics circuits and communication systems
		To classify different types of modulation and demodulation techniques and describe various types of receiver systems
SBEC -VI	Microprocessor and its applications	To explain the architecture of microprocessor and its coding scheme
		To implement simple programs using assembly language.
		To understand for Classification of instruction set.

**Name of the Programme: Master of Physics M.Sc (PHY)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Specific Outcome(PSO):**

PSO1	Gained the ability to identify and analyse complex Physics problems using the principles of Physics with suitable mathematical tools.
PSO2	Acquired skills which will put the learners at an advantage in careers as drivers to associate with different subjects.
PSO3	Moulded to adopt, absorb and develop innovative ideas
PSO4	Developed skills to communicate effectively with peers , professionals and society at large and demonstrate professional ethics
PSO5	Exhibited effective individual talent, and engaged themselves in lifelong learning and dissemination

**Programme Outcome(PO):**

PO1	Graduates will be able to apply assimilated knowledge to evolve tangible solution to emerging problems.
PO2	Graduates will be able to analyze and interpret data to create and design new knowledge.
PO3	Graduates will be able to engage in innovative and socially relevant research and effectively communicate the findings.
PO4	Graduates will become ethically committed professional and entrepreneurs upholding human values.
PO5	Graduates imbued with ethical values and social concern will be able to understand and appreciate cultural diversity, social harmony and ensure sustainable environment.

**COURSE OUTCOME**

**Name of the Programme: Master of Physics M.Sc (PHY)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

I	Core - I	Classical Mechanics, Thermodynamics and Statistical Mechanics	Acquire knowledge about conservation laws, constraints, relativistic mechanics, Lagrangian and Hamiltonian dynamics. Understand Kepler problem, rigid body dynamics, relativistic mechanics Lagrangian and Hamilton's formulation. Analyse the Euler's equations and apply them for rigid body dynamics. Evaluate the concepts of inertial, non-inertial frames of references and rotating coordinate system in relativistic mechanics Apply and formulate the Lagrangian and Hamiltonian to solve problems in mechanics and relativistic mechanics.
	Core - II	Mathematical Physics	Acquire the knowledge about different mathematical methods like vector and matrix algebra, partial derivatives, complex functions, special functions, Fourier series and integral transforms for solving different physics problems Solve partial differential equations, identify complex-differentiable functions, construct Fourier series and integral transforms and special functions. Compute Eigen values and Eigen vectors, line integrals using Cauchy's integral theorem for different physics problems, apply method of separation of variable in different coordinate systems Apply matrix spaces, partial differential equations, integral transforms, special functions to obtain the solution for complex physics problems
	Core - III	Electronics	Describe and discuss characteristics diode, P-N junction, schottky diode and varactor diode Electronics. Outline semiconductor devices, examine the Analog and digital circuits and identify the states and working characteristics of circuits. List and use the methods to examine Analog and digital circuit problems. Assess the limitations of Analog and Digital circuits and recommend the solutions. Design and construct Analog and Digital circuits
	ELECTIVE-I	Microprocessor & Microcontroller	Describe and discuss the architecture of Microcontroller list and outline the features of Arduino IDE, syntax and algorithm and use this to solve the problems. Investigate and explain the automatic electronic devices and plan self-sustainability, employability and over all personality Identify the applications of Arduino, recommend the methods, design and construct various physics Instruments.
II	Core - IV	Theory of Semiconductor Devices	Describe and outline structure of Semiconducting materials Explain and illustrate the semiconductor junction Examine the semiconducting devices and circuits, explain the working characteristics and use these principles in the complex circuits. Assess the electronic device problems and recommend the solutions and synthesis new materials for semiconductor devices
	Core - V	Quantum Mechanics - I	Describe the principles and methods of wave mechanics and matrix mechanics based on Dirac notation. Explain quantum mechanical methods to study angular momentum and various perturbed systems. Apply the quantum theory to 1D potentials, 3D potentials, rotation & addition of angular momenta, stationary states and time-dependent systems Analyse various properties using the quantum theory and compare it with the results of classical physics. Evaluate and summarize the methods and properties of various quantum mechanical systems.
	Core - VI	Computational Physics & C++ Programming	Gain knowledge on the mathematical methods in Tensors, Group Theory and programming Language and comprehend the same for the problems in physics at ease Apply the knowledge gained in computational and numerical methods to solve problems in physics Analyse computationally the given problems in physics by various theoretical models. Evaluate the complex problems in physics based on specific theories, procedures and tools. Synthesis the computational methods adapted to produce precise and accurate results on select problems
	ELECTIVE-II	Nano Physics	Acquire the knowledge on fundamentals of nanoscience. Understand and realize the applications of various nanostructures towards optical and electronic devices. Apply quantum physics concepts on nanostructures and study the corresponding physical and chemical properties Analyse the various processing techniques to fabricate nanodevices. Evaluate the properties of nanostructures with size and morphology and develop an appropriate conclusion in favour of change in properties.
III	Core - VII	Electromagnetic Theory & Plasma Physics	Impart and describe the knowledge on the concepts in electrostatics, magnetostatics, field equations and electromagnetic waves. Explain the boundary conditions in electrostatics and magnetostatics, Poynting theorem. Apply and analyze the knowledge to solve image problems, magnetic field and potential problems. Relate and check the knowledge from symmetry problems, Gauss law and Biot-Savart's law. Compare and summarize TE, TM, TEM waves, normal and oblique incidences for conductors.
	Core - VIII	Quantum Mechanics-II	Describe the principles and methods of wave mechanics and matrix mechanics based on Dirac notation. Explain quantum mechanical methods to study angular momentum and various perturbed systems. Apply the quantum theory to 1D potentials, 3D potentials, Electric dipole transition - Selection rules and polarizability forbidden transitions. Analyse various properties using the quantum theory and Approximations in atomic structure - Central field approximation. Evaluate and Klein-Gordon Equation for a free particle and its solution - Charge and current densities in four vector.
	Core - IX	Molecular Physics & Spectroscopy	Acquire knowledge and understand the aspects of various spectroscopic methods like rotational spectroscopy. Explain the theory and principles of vibrational spectroscopy and its techniques.
			Perceive the theory and principles of electronic and X-ray spectroscopy and apply them to describe fluorescence and phosphorescence Comprehend the basics of Raman spectroscopy and evaluate and examine the molecular and atomic structure of different advanced materials. Understand the physics behind NMR and ESR spectroscopy, Mossbauer spectroscopic techniques and apply it to examine new materials and to make novel drugs in the field of medicine.

	ELECTIVE-III	Crystal Growth & Thin Film Physics	<p>Acquire the knowledge about the fundamentals of nucleation and various crystallization theories.</p> <p>Understand various crystallization theories, various crystal growth methods and thin film deposition techniques.</p> <p>Apply the essential processing parameters for different crystal growth and thin film deposition techniques.</p> <p>Analyze the different growth techniques and choose an appropriate technique to grow crystals and thin films.</p> <p>Evaluate the merits and demerits of different growth techniques and design a new growth approach to overcome the existing demerits.</p>
IV	Core - X	Nuclear & Elementary Particle Physics	<p>Recall and explain a clear picture of nuclear composition, Radio activity, cosmic rays and understand various nuclear models.</p> <p>Understand the working of nuclear detectors and counters, realize the importance of Cosmic rays and its effects on earth</p> <p>Apply and Evaluate the applications of Nuclear Physics to Medical field and various other fields related to Physics.</p> <p>Analyse the different types of nuclear particles and particle accelerators.</p> <p>Formulate the four-factor formula and compound nuclear theory based on nuclear fission and fusion concepts</p>
			<p>Acquire knowledge and understand the behaviour of electrons in solids based on classical and quantum theories.</p> <p>Apply the knowledge and analyse the available semiconducting and superconducting materials.</p> <p>Able to differentiate between ferroelectric, anti-ferroelectric, piezoelectric, pyroelectric materials, Plasmons.</p> <p>Create an eco-friendly environment with lifelong development and usage of condensed matters.</p> <p>Develop and synthesize new materials for a requirement.</p>
			<p>Acquire the principles of solar energy and predict its utilization.</p> <p>Understand the classifications of the solar energy collectors and methodologies of storing solar energy</p> <p>Know the applications of solar energy, wind energy and biomass and other forms of energy sources.</p> <p>Analysis the different forms of energy resources based on its economic aspects.</p> <p>Assess the generated renewable energies and design the different energy resources.</p>
	Core - XI	Condensed Matter Physics	<p>Acquire knowledge and understand the behaviour of electrons in solids based on classical and quantum theories.</p> <p>Apply the knowledge and analyse the available semiconducting and superconducting materials.</p> <p>Able to differentiate between ferroelectric, anti-ferroelectric, piezoelectric, pyroelectric materials, Plasmons.</p> <p>Create an eco-friendly environment with lifelong development and usage of condensed matters.</p> <p>Develop and synthesize new materials for a requirement.</p>
			<p>Acquire the principles of solar energy and predict its utilization.</p> <p>Understand the classifications of the solar energy collectors and methodologies of storing solar energy</p> <p>Know the applications of solar energy, wind energy and biomass and other forms of energy sources.</p> <p>Analysis the different forms of energy resources based on its economic aspects.</p> <p>Assess the generated renewable energies and design the different energy resources.</p>
	ELECTIVE-IV	Physics of Non-conventional Energy Resources	<p>Acquire the principles of solar energy and predict its utilization.</p> <p>Understand the classifications of the solar energy collectors and methodologies of storing solar energy</p> <p>Know the applications of solar energy, wind energy and biomass and other forms of energy sources.</p> <p>Analysis the different forms of energy resources based on its economic aspects.</p> <p>Assess the generated renewable energies and design the different energy resources.</p>

# DEPARTMENT OF CHEMISTRY

**Name of the Programme: Bachelor of Science B.Sc (Che)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

## Programme Specific Outcome(PSO):

PSO1	Have enormous job opportunities at all levels of chemical, pharmaceutical and food product industries
PSO2	Get specific placements in R &D and synthetic division of polymer industries & Allied divisions
PSO3	Appear in competitive exams conducted by service commission
PSO\$	Gain complete knowledge about all fundamental aspects of chemistry
PSO4	Learn about the emerging field of green chemistry, nanochemistry and polymer chemistry
PSO5	Carry out experiments in the area of organic analysis, estimation, inorganic semi-micro analysis, conductometric & potentiometric equipment

**Name of the Programme: Bachelor of Science B.Sc (Che)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

## Programme Outcome(PO):

PO1	think critically and analyze chemical problems
PO2	Present scientific and technical information resulting from laboratory experimentation in both written and oral forms
PO3	Work effectively and safely in a laboratory environment
PO4	Use technologies and instrumentation together to explore new areas of research
PO5	Work as a member of interdisciplinary problem solving team
PO6	Apply their scientific skill to innovative studies

**Name of the Programme: Bachelor of Science B.Sc (Che)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
I	Core - I	General chemistry-I	study of s,p-block elements and basic principles of Volumetric analysis
			Mode of formation of ionic bond and covalent bond
II	Core - II	General chemistry-II	Understanding the Basic concepts in Organic Chemistry
			Practice the IUPAC nomenclature of various organic and inorganic compounds
			Understanding the various gaseous laws and their Behaviour
			Understanding the Preparation and properties of Nitrogen and Oxygen family
	SBEC	Food and nutrition	Understanding the concept of Aromatic compounds and their substitution
			study the mechanism of Elimination and substitution reactions
			Recognize the different types of liquid crystals and colloids
			Practice the various crystal structure and their experimental studies.
Core Chemistry Practical I	Volumetric Estimations and Organic Preparations	Identify the various sources of food.	
		Understand the various nutrients	
		Analyze the various food poisoning, Adulteration and food preservatives.	
		Study all the sources and deficiency of Vitamins and minerals	
Allied Chemistry Practical I	Volumetric and Organic Analysis	Acidimetry, Alkalimetry and Permanganometry titrations	
		Iodometric and Complexometric titrations	
		Organic Preparations	
		Titrimetric analysis of various compounds	
III	Core - III	General chemistry-III	Analysis of Organic Compounds
			Analyse the various inorganic qualitative analysis
			Understanding the Halogen family and Chemistry of rare gases
			Understanding the various Oxidation and reduction reactions
			Memorize the Terminology of Thermodynamics
IV	Core - IV	General Chemistry	Analyse the Second law of Thermodynamics I
			Study of d block elements, principles of Metallurgy
			Analyse the various Gravimetric technique
			Study of unsaturated, hydroxy and dicarboxylic acid
	SBEC	Polymer Chemistry	Study of mechanism of various naming reactions
			Analyse the second law of Thermodynamics II
			Study of all the Basic concepts of Polymers
			Understanding the various structures of polymers
I/III	Allied - I	Organic Inorganic and Physical Chemistry	Analyse the various methods of determination of molecular weight
			Study of preparation and properties of various polymers and plastics
			Study of various types of chemical bonding
			Understanding the various concepts of nuclear chemistry
II/IV	Allied - II	Organic Inorganic and Physical Chemistry	Analyse the basic concepts of Organic Chemistry
			Identify the various aromatic compound and heterocyclic compounds
			Understanding the basics of Polymer Chemistry
			Study of various terms of Co-ordination Chemistry
			Identify various Carbohydrates and aminoacids
Understanding the concept of Pharmaceutical Chemistry			
Understanding the Photo Chemistry and Phase rule			
Study of Electro Chemistry and Corrosion			

III	NMEC	Industrial Chemistry	Study of preparation and properties of various fuels
			Understanding the manufacturing process of soaps and detergents
			Study of Chemistry Sugar mad fermentation process
			Study of Glass and Cement industry
			Understanding the various process of leather and paper industry
IV	NMEC	Agriculture Chemistry	Understanding the Chemistry of soils, Classification, and its Propertires
			Analyse the various types of soils
			Study of different types of fertilizers
			Study of pesticides and their preparation
	Core Chemistry Practical II	Inorganic qualitative analysis and preparations	Analysis of water and its treatment
			Analysis of various cations and anions
	Allied Chemistry Practical I	Volumetric and Organic Analysis	Inorganic Preparations
Titrimetric analysis of various compounds			
			Organic analysis

**Name of the Programme: Bachelor of Science B.Sc (Che)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2019 onwards**

**Programme Specific Outcome(PSO):**

PSO1	Ability to synthesis, design new compounds and able to rectify solutions for upcoming problems.
PSO2	Able to assist in various qualitative analysis to prevent adulteration and precaution to avoid further confusion.
PSO3	To focus on problem shooting and solving in chemical reaction aspects.
PSO4	Well trained up in handling explosive and dangerous chemicals in safe manner.
PSO5	To have an innovative thinking in synthetic reactions and maintaing lab performance.

**Programme Outcome(PO):**

PO1	Having leadership qualities in lab maintaing and follow proper protocol for instrument handling.
PO2	Able to work in group project as well as individual project to provide good outcoming result.
PO3	Systematic approach of problems during synthetic reaction and extractions of chemical compounds.
PO4	To work in various fields of chemistry like Pharmaceutical chemistry, Dairy chemistry, Leather chemistry and in sterling lab.
PO5	Able to identify various toxic nature in water by perfroming water analysis.

**COURSE OUTCOME**

**Name of the Programme: Bachelor of Science B.Sc (Che)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2019 onwards**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
V	Core -V	Inorganic Chemistry I	Detailed study of acids and bases
			Nature of f block elements and its behaviour
			Study of Co-ordinatination Chemistry and its application
			Study of various theories like VBT, VSPER theory
			Study of stability of complexes and transeffect
			Study of Stereoisomerism, determination of R,S notation of compounds
	Core - VI	Organic Chemistry I	Understands Optical activity of molecules
			Detailed study of aminoacids synthesis and uses
			Study of DNA and RNA
			Study of alkaloids and steroids and its preparation
			Understand the : Chemical equilibrium of reaction
			Understand the: To study rate of reaction
	Core - VII	Physical chemistry I	Understand the : Various methods to predict chemical kinetics,
			Understand the : preparation of batteries
			Understand the: Reactions involved in batteries
			Study of various seperation technique
			Dtermination of analysis on chemical substance
			Application of UV and IR Spectroscopy
Elective	Analytical Chemistry I	Application of Raman Spectroscopy	
		Preparation and uses of fertilizer	
		Advantage of manures	
		Application of fungicides and herbicides.	
		Study of nature of soil.	
		Synthesis of various dyes	
SBEC	Agricultural chemistry	Application of dyes on fabrics	
		Waste management of solvents.	
		Study of preparation and applications of indigo dyes	
		Safe removal of effluents from industries	
		Application of Bio-inorganic molecules	
		Preparation of organometallic compounds	
SBEC	Dye stuff and effluent treatment	Applications of organometallic compounds	
		Study of nanoscience in day today life	
		Identify the symmetry elements and operations	
		Understanding the Carbohydrate synthesis	
		Study of Nature of vitamins and antibiotics	
		Study of Molecular rearrangement for synthesis of various compounds	
Core - VIII	Inorganic Chemistry II	Understanding the importance of Green Chemistry	
		Study of important reagents and their applications	
		Understanding the preparation of solution and phase rule	
		Study of electro Chemistry for industries	
		Study of Photochemical reactions involved in various substance	
		Study of different types of concentration cells and batteries	
Core - IX	Organic Chemistry II		
Core X	Physical chemistry II		

			Understanding the principle of photo chemistry
	Elective - III	Analytical Chemistry II	Study of Chromatographic separation techniques of various compound Study of TGA & DTA analysis of simple and complex molecules Study of NMR Spectroscopy for structural elucidation. Study of Mass Spectroscopy for structural elucidation. Study of spectral applications in organic molecules
	SBEC - V	Pharmaceutical Chemistry	Important terms in pharmacology Study of preparation of antibiotic Study of applications of analgesics Study of Various diabetic treatments and anaesthesia treatment. Study of various medicinal plants and application
	SBEC - VI	Industrial Chemistry	Study of various steps in leather preparation Study of Chemical explosive and its disadvantages Study of preparation of paints, varnishes and cleansing agents, Manufacture of cement and their applications Manufacture of glass and their applications
	Core Practical -III	Physical Chemistry practicals	Determination of Kinetics experiments Determination of molecular weight of substances Determination of Phase rule Analyse the Electro Chemistry Applications Study of Electrical Experiments
	Core Practical - IV	Gravimetric Estimations and Organic practicals	Analysis of Organic substance Preparation of Organic substance Identify the Boiling point of substance Estimation of Inorganic substances

<b>Name of the Programme: Master Of Chemistry M.Sc (CHE)</b>			
<b>For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards</b>			
<b>Programme Specific Outcome(PSO):</b>			
PSO1	Have enormous job opportunities at all levels of chemical, pharmaceutical and food product industries.		
PSO2	Get specific placements in R&D and synthetic division of polymer industries and Allied divisions.		
PSO3	Appear in competitive exams conducted by service commission.		
PSO4	Gain complete knowledge about all fundamental aspects of Chemistry		
PSO5	Learn about the emerging field of green Chemistry, nanochemistry and polymer Chemistry		
PSO6	Carry out experiments in the area of organic analysis, estimation, inorganic semi-micro analysis, conductometric and potentiometric equipment		
<b>Programme Outcome(PO): On successful completion of this programme, students will have the ability to</b>			
PO1	Think critically and analyze chemical problems.		
PO2	Present scientific and technical information resulting from laboratory experimentation in both written and oral formats.		
PO3	Work effectively and safely in a laboratory environment.		
PO4	Use technologies and instrumentation together to explore new areas of research.		
PO5	Work as a member of interdisciplinary problem solving team.		
PO6	Apply their scientific skill to innovative studies.		
<b>COURSE OUTCOME</b>			
<b>Name of the Programme: Master of Chemistry M.Sc (Che)</b>			
<b>For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards</b>			
<b>I</b>	Core - I	Organic Chemistry-I	To Learn about stereochemistry of organic compounds To learn about the formation, stability and structure of intermediates and the effect of structure on reactivity. To learn about the mechanism of aliphatic and aromatic nucleophilic substitution reactions and aromatic electrophilic substitution reactions
	Core - II	Inorganic Chemistry-I	To learn about the structural elucidation of alkaloids flavones and isoflavones. To learn about the various theories of complexes, mode of coordination with various geometry. To study the recent development in polymeric materials of coordination complexes.
	Core - III	Physical Chemistry-I	To study in detail the basic concepts of classical thermodynamics and chemical kinetics To understand the principles of quantum chemistry and group theory
	Elective-IA	Polymer Chemistry	To study the basic concepts in polymer chemistry. To learn about the kinetics and types of co-ordination polymerization. To study the measurement of molecular weight and the properties of polymers. To study about the polymer processing and properties of commercial polymers To develop scientific ability
	Core - IV	Organic Chemistry-II	To learn the mechanism of Elimination reactions. To understand the basic concepts of aromaticity. To know the effects of light in organic reactions. To study the pericyclic reactions. To learn the uses of oxidation and reducing reagents in organic synthesis.
	Core - V	Physical Chemistry-II	To study in detail the basic concepts of statistical thermodynamics and chemical kinetics To understand the principles of quantum chemistry and group theory To impart knowledge on surface chemistry and catalysis

II	Elective -II	Spectroscopy	To understand the basic concepts of spectroscopic techniques and to solve the structures from the spectra
			To study in detail about UV-VIS, IR, ESR, PAS and NMR spectroscopic techniques
			To develop problem solving skills from various type of spectra
	EDC	Basics of Microbiology	To know about evolution of biological species and the various methods of treating Bio species
		Human Rights	To know the various law and act of indian democracy and help public to resolve their problems and creating awareness
	Core Practical-I	Organic Chemistry Practical-I	To perform the qualitative analysis of a given organic mixture. To carry out the preparation of organic compounds.
	Core Practical-II	Inorganic Chemistry Practical-I	To perform the semi micro qualitative analysis.
To estimate the metal ions by colorimetric methods. To prepare inorganic complexes.			
Core Practical-III	Physical Chemistry Practical-I	To perform experiments in chemical kinetics, phase rule and chemical equilibrium.	
		To perform experiments in conductometry.	
III	Core - VI	Organic Chemistry-III	To learn the mechanism of addition to Carbon - Carbon and Carbon - Hetero atom, multiple bonds.
			To learn the mechanism of molecular rearrangements.
			To study the mechanism of oxidation and reduction reactions. To study the structural elucidation of steroids. To study ORD, CD and mass spectrometry of organic compounds
	Core - VII	Inorganic Chemistry-II	To study about the X-ray crystal structure of the compounds
			To learn about the analytical tools which are used in nuclear chemistry
Core - VIII	Physical Chemistry-III	To impart knowledge on electrochemistry, photochemistry, quantum chemistry and spectroscopy	
		To study the concepts and principles of electrochemistry, photochemistry, quantum chemistry and spectroscopy	
Elective-III	Experimental Methods in Chemistry	To study in detail the fundamental aspects of various experimental and instrumental methods in chemistry	
		To understand the principles and instrumentation of destructive and non-destructive techniques	
		To understand the various techniques in Chromatography	
IV	Core - IX	Inorganic Chemistry-III	To learn the detailed study of synthetic organometallic complexes owing to the preparation as well as their reactivity and application which is very useful in the modern era.
			To understand the characterization of nanomaterials
	Elective Paper-IV	Green and Nano Chemistry	To understand carbon clusters and nanostructures
			To understand the green concepts of organic reactions
	Core Practical-IV	Organic Chemistry Practical-II	To perform organic estimations
			To prepare organic compounds involving two stages.
	Core Practical-V	Inorganic Chemistry Practical-II	To perform quantitative estimation of inorganic mixture.
To perform analysis of ores and alloys To prepare inorganic complexes.			
Core Practical-VI	Physical Chemistry Practical-II	To perform experiments in potentiometry, polarography and chemical kinetics.	
		Experiments in Electrochemistry, Polarography and Chemical Kinetics	
Project	Dissertation/Project work	titled in the field of chemical studies	

# DEPARTMENT OF MATHEMATICS

Name of the Programme: Bachelor of Mathematics B.Sc (Maths)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards

**Programme Specific Outcome(PSO):**  
Upon completion of the degree requirements, students will be able to

<b>PSO1</b>	Acquire good knowledge and understanding, to solve specific theoretical & applied problems in different area of mathematics & statistics.
<b>PSO2</b>	Understand, formulate, develop mathematical arguments, logically and use quantitative models to address issues arising in social sciences, business and other context /fields.

**Programme Outcome(PO):**  
Upon completion of the degree requirements, students will be able to

<b>PO1</b>	Good foundation in fundamentals of Mathematics subjects will be acquired.
<b>PO2</b>	Knowledge and skills to undertake further studies in Mathematics and its allied areas will be ensured

## COURSE OUTCOME

Name of the Programme: Bachelor of Mathematics B.Sc (Maths)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
I	CORE I	CLASSICAL ALGEBRA	Gain knowledge about binomial, exponential and logarithmic series Examine the consistency of linear equations and application of Cayley-Hamilton theorem Know the application of relations between the roots and coefficients of an equation  Analyse the method of solving reciprocal equations and diminishing the roots of an equation Examine the existence of roots of an equation and determine the roots by using Newton's and Horner's methods
	CORE II	CALCULUS	Gain knowledge about curvature and envelopes.  Gain knowledge about integration and its applications.
II	CORE III	ANALYTICAL GEOMETRY OF 2D & 3D	To gain knowledge about Conic 2D Understand the concepts of coplanar lines and skew lines and find the shortest distance between them To gain the knowledge about sphere and identify the characteristics of sphere Enhance the fundamental concepts of cone and cylinder To develop the concepts of coincoides.
	CORE IV	TRIGONOMETRY & VECTOR ANALYSIS	Recall the basic concepts and understand the expansions of Trigonometric functions Acquire knowledge on Hyperbolic functions and Logarithm of complex numbers  Gain knowledge on the concept of divergence, curl and integration of vector point functions Analyse and work with the problems related to line integrals, surface and volume integrals Solve the problems related to Gauss Stoke's and Green's theorems
III	CORE V	NUMBER THEORY	To understand the basic properties of integers. Formally understand and prove various theorems. Applying theoretical results acquired to solve different problems.
	CORE VI	DIFFERENTIAL EQUATIONS	Students will be able to classify the differential equations with respect to order and linearity. Students will be able to solve the second order differential equations, linear equations, linear differential equations with constant coefficients. Students will be able to understand the basic properties of standard PDE's and solve the
	SBEC-I	FINANCIAL MATHEMATICS	To understand the basic concepts of Financial Mathematics. To understand and prove theorems. To understand the method to solve the problems by applying principles and concepts of Financial Mathematics
IV	CORE VII	LAPLACE TRANSFORMS & FOURIER SERIES	Have a sound knowledge of Laplace Transform and its properties. Have sufficient exposure to get the solution of certain linear differential equation using Laplace Transform and inverse Laplace Transform. Have an idea of periodic function and come to know how to expand the given functions as a series of sines and cosines which are simple periodic functions.  Have an idea of Fourier Transform and its properties which can be applied in future for solving Partial Differential equations by reducing the number of independent variable by one.
	CORE VIII	NUMERICAL METHODS	Use numerical methods to solve the algebraic and transcendental equations by using Bisection, Newton's method and some iterative methods. Have a sufficient exposure in constructing difference tables and to use Newton's forward and backward formula for interpolation in equal intervals. Have learnt to construct divided difference table and to use Stirling's, Bessel's and Lagrange's interpolation formula for unequal intervals. Have understood the numerical differentiation and numerical differentiation and numerical integration by using Newton's methods and Trapezoidal, Simpson's rule. Have learnt the methods like matrix inversion, Gaussian, Gauss seidel methods etc., for solving linear system of algebraic equations.  Make different Alignments in a document and an Application for a job.

	SBEC II	LATEX – PRACTICAL	Generate Bio-Data, and Table Structures. Create Mathematical Statements using LaTeX. Prepare Articles and Inserting Pictures. Prepare Question paper and PowerPoint presentation in LaTeX format.
I	ALLIED-I	ALGEBRA AND CALCULUS	Know the application of relations between the roots and coefficients of an equation and diminishing the roots of an equation Ability to solve the consistency of linear equations and application of Cayley-Hamilton theorem Understanding the concepts of Cartesian co-ordinates, parametric co-ordinates and polar co-ordinates. Understand the basic properties of PDE. Gain the skill to solve problems.
II	ALLIED-II	DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS	Understanding the concepts of Maxima and Minima. Developing the knowledge in Numerical Methods problem solving. Understanding the second order differential equations with constant coefficients. Understand the basic properties of Laplace Transforms. Solving the simple problems in inverse Laplace and its applications.
	ALLIED PRACTICAL	ALLIED MATHEMATICS - III – PRACTICALS	Gain the skill to solve the problems in Matrices. Gain knowledge to solve the problems in partial differentiation. Gain knowledge on the concept of divergence, curl and integration of vector point functions
III	NMEC	QUANTITATIVE APTITUDE- I	Make sense of problems, develop strategies to find solutions and persevere in solving them. Use appropriate technology in a given context. Critique and evaluate quantitative arguments that utilize mathematics, statistical and quantitative information. Solve problems in numbers, decimal fractions, square root and cube roots.
IV	NMEC	QUANTITATIVE APTITUDE – II	Make sense of problems, develop strategies to find solutions and persevere in solving them. Use appropriate technology in a given context. Solving the problem on time and work, time and distance, boat and stream. Solving the problem on logarithms, volume and surface area, height and distance, odd man out.

**Name of the Programme: Bachelor of Mathematics B.Sc (Maths)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2019 onwards**

**Programme Specific Outcome(PSO):**

**PSO1** To prepare the students who will demonstrate respectful engagement with other's ideas, behaviors, beliefs and apply diverse frames of references to decisions and actions.

**PSO2** To create effective entrepreneurs by enhancing their critical thinking, problem solving, decision making and leadership skill that will facilitate startups and high potential

**Programme Outcome(PO):**

**PO1** Scientific temper, analytical thinking, imagination, creativity and critical thinking will be developed.

**PO2** Knowledge and confidence to face various competitive examinations will be gained.

**COURSE OUTCOME**

**Name of the Programme: Bachelor of Mathematics B.Sc (Maths)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2019 onwards**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
V	CORE IX	MODERN ALGEBRA-I	Understand the concepts of various Subgroups and its applications
			Acquire Knowledge about the concepts of homomorphisms, isomorphisms and automorphisms
	CORE X	REAL ANALYSIS - I	Gain knowledge about the concepts of Rings and Quotient Rings
			Analyse the concept of Field and Euclidean Ring
	CORE XI	COMPLEX ANALYSIS-I	Analyse and demonstrate the properties of Polynomial Rings
			Understand basic concepts of sequence and series.
	ELECTIVE I	OPERATIONS RESEARCH	Understand and prove various theorems.
			Understand the method to solve simple problems by applying concepts of Analysis.
			Formulate simple reasoning and learning optimization problems.
			Analyze a problem and can select a suitable strategy.
ELECTIVE II	ASTRONOMY	Apply an appropriate method to obtain the solution to a problem.	
		Manipulate the basic mathematical structures underlying these methods.	
ELECTIVE II	DISCRETE MATHEMATICS	Evaluate analytically the limitations of these methods.	
		Gain knowledge about solar system.	
		Gain knowledge about double & multiple stars.	
		Recall the various concepts of Mathematical Logic	
ELECTIVE II	NUMBER THEORY	Understand the concepts of different types of normal forms	
		Classify the various types of functions and make them to use in practical applications related to	
		Gain knowledge about the Algebraic systems	
		To understand the basic properties of integers.	
ELECTIVE II	NUMBER THEORY	Formally understand and prove various theorems.	
		Applying theoretical results acquired to solve different problems.	
ELECTIVE II	NUMBER THEORY	Understand the structure of C program, its keywords, declaration of variables and defining symbolic commands.	
		Use arithmetic operators, logical operators, relational operators, increment and decrement	

	SBEC III	C – Programming (Theory)	Know the decision making using IF statement, IF ELSE statement, and to have jumps in loops using GOTO, WHILE, DO, FOR and SWITCH statement. Define one dimensional array, two dimensional arrays, and to declare string variables. Understands the need for user defined functions, return values and their types, calling function, and category of functions.
	SBEC IV	C-Programming (Practical)	Understand the concept of function overloading, operator overloading, virtual functions and polymorphism. Practice the C Programming
VI	CORE XII	MODERN ALGEBRA-II	Find the linear dependence and independence, dimension of spaces. Know the concepts of null spaces, range and Matrix representation of a linear transformation. Solve System of Linear equations by using Rank. Understand about Inner Product Spaces. Compute the orthogonal projection of a vector.
			Understand concepts of connectedness, completeness and compactness of metric spaces. Understand basic concepts of Riemann Integration and solving simple problems. Solving problems by using theorems on derivatives.
	CORE XIII	REAL ANALYSIS – II	Know the concepts of Limits, Continuity and Analytic functions. Solve Complex Integrals. Discuss Convergence of Sequences and Series, Taylors series and Laurents series.
	CORE XIV	COMPLEX ANALYSIS-II	Formally understand and prove theorems and lemmas. Apply theoretical knowledge acquired to solve realistic problems in real life. Apply principles and concepts of graph theory in practical situations and to improve the proof
	CORE XV	GRAPH THEORY	Use numerical methods to solve the algebraic and transcendental equations by using Bisection, Newton's method and some iterative methods. Have a sufficient exposure in constructing difference tables and to use Newton's forward and Have learnt to construct divided difference table and to use Stirling's, Bessel's and Lagrange's interpolation formula for unequal intervals. Have understood the numerical differentiation and numerical differentiation and numerical integration by using Newton's methods and Trapezoidal, Simpson's rule. Have learnt the methods like matrix inversion, Gaussian, Gauss seidel methods etc., for solving linear system of algebraic equations.
	ELECTIVE III	NUMERICAL ANALYSIS	Understand fundamentals of programming such as Variables, Conditional and iterative execution, methods etc. Understand fundamentals of object – oriented Programming in JAVA, including defining Be aware of the important topics and principles of software development. Have the ability to write a computer program to solve specified problems.
			JAVA PROGRAMMING
	SBEC V	LATEX THEORY	Make different Alignments in a document and an Application for a job. Generate Bio-Data, and Table Structures. Create Mathematical Statements using LaTeX. Prepare Articles and Inserting Pictures. Prepare Question paper and PowerPoint presentation in LaTeX format.

**Name of the Programme: Master of Mathematics M.Sc (Mathematics)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

<b>Programme Specific Outcome(PSO):</b>	
PSO1	To prepare the students who will demonstrate respectful engagement with others' ideas, behaviors, beliefs and apply diverse frames of reference to decisions and actions.
PSO2	To create effective entrepreneurs by enhancing their critical thinking, problem solving, decision making and leadership skill that will facilitate startups and high potential
PSO3	Design and implement HR systems and practices grounded in research that comply with employment laws, leading the organization towards growth and development.
PSO4	To produce employable, ethical and innovative professionals to sustain in the dynamic business world.
PSO5	To contribute to the development of the society by collaborating with stakeholders for mutual benefit.
<b>Programme Outcome(PO):</b>	
PO1	
PO2	Foster analytical and critical thinking abilities for data-based decision-making.
PO3	Ability to incorporate quality, ethical and legal value-based perspectives to all organizational activities.
PO4	Ability to develop communication, managerial and interpersonal skills.
PO5	Capability to lead themselves and the team to achieve organizational goals.
PO6	Inculcate contemporary business practices to enhance employability skills in the competitive environment.
PO7	Succeed in career endeavours and contribute significantly to society
PO8	Ability to embrace moral/ethical values in conducting one's life
<b>COURSE OUTCOME</b>	

**Name of the Programme: Master of Mathematics, M.Sc (Maths)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

I	Core - I	LINEAR ALGEBRA	Describe a diagonalizable operator T in a language of invariant direct sum decompositions (projections which commute with T). Find the minimal polynomials, Jordan forms and the rational forms of real matrices
	Core - II	REAL ANALYSIS – I	completeness and connectedness that will help for further studies within topology and To demonstrate an understanding of limits and how they are used in sequences, series,

			To construct rigorous mathematical proofs of basic results in real analysis.
	Core - III	ORDINARY DIFFERENTIAL EQUATIONS	To solve the differential equations by using various methods
	Core - IV	MECHANICS	The students will understand the formation of differential equations which will help to study the dynamics of mechanical systems.
II	Core - V	ABSTRACT ALGEBRA	To find the number of Sylow subgroups. To find the number of nonisomorphic abelian groups. To find the splitting field, Galois group of the given polynomial To check whether the given polynomial is solvable by radicals or not.
	Core - VI	REAL ANALYSIS – II	To find the integrals of a bounded function on a closed bounded interval To understand sequences and series of functions and its convergence To find the derivative of functions of several variables.
	Core - VII	PARTIAL DIFFERENTIAL EQUATIONS	Be familiar with the modeling assumptions and derivations that lead to PDE's. Recognize the major classification of PDEs and the qualitative difference between the classes of equations. Be competent in solving linear PDEs using classical methods.
	Core - VIII	COMPLEX ANALYSIS	Be familiar with the modeling assumptions and derivations that lead to Complex Analysis Recognize the major classification of analytic functions, harmonic functions, conformal mappings and the qualitative difference between the complex integration & Real integration
III	Core - IX	TOPOLOGY	To understand various concepts of Topology.
	Core - X	MEASURE THEORY AND INTEGRATION	At the end of the course, the students will able get the knowledge of Measure and Outer measure, generalization of integrals with help of measures.
	Core - XI	GRAPH THEORY	To identify the graphs of connectivity and tree. To find the Independent set and cycle graph. To understand graph coloring. To check planarity
	Core - XII	FUNCTIONAL ANALYSIS	Understand the relationship between metric space, normed space, inner product space. Understand properties of continuous linear functionals on Banach space Understand various types of operators on Hilbert space. Know Regular elements, singular elements, spectrum of Banach algebra & its ideals
IV	Core - XIII	PROBABILITY THEORY	To get the knowledge of Random variables and Random events
	Core - XIV	CALCULUS OF VARIATIONS AND INTEGRAL EQUATIONS	To understand characteristic of function and Properties of characteristic function To know different types of transforms and their properties.
	Core - XV	PROJECT	To find the stability results for the linear system using eigen value criteria Present his views cogently and precisely
I	Elective Course – I	DISCRETE MATHEMATICS	Express a logic sentence in terms of predicates, quantifiers and logical connectives. Apply the rules of inference and methods of proof including direct and indirect proof forms, proof by contradiction and mathematical induction. Solve m a t h e m a t i c s problems that involve computing permutations and combinations of a set, fundamental enumeration principles.
		COMBINATORIAL MATHEMATICS	Evaluate Boolean functions and simplify expressions using the properties of Boolean algebra Use formulas for counting basic combinatorial outcomes to construct solutions to complete combinatorial enumeration problems: permutation, with and without repetitions; combinations, with and without repetitions; Apply counting strategies to solve discrete probability problems Use specialized techniques to solve combinatorial enumeration problems: generating functions; recurrence relations; Inclusion-exclusion principle
II	Elective Course – II	NUMERICAL ANALYSIS	To learn the principles for designing numerical schemes for differential equations. To be able to analyze the consistency, stability and convergence of a numerical scheme To be able to know, for each type of differential equations, what kind of numerical methods are best suited for and the reasons behind these choices Be able to make a connection between the mathematical equations or properties and the corresponding physical meaning To be able to use a programming language or mathematical software to implement and test the numerical schemes
		DIFFERENCE EQUATIONS	To know the fundamentals of difference calculus, like, the difference operator, the computation of sums, the concept of generating function and the important Euler summation formula. To solve linear difference equations using different methods, namely, annihilator method, z-transform method, etc. To find the stability results for the linear system using eigen value criteria To find asymptotic analysis of sums, and asymptotic behavior of solutions to linear difference equations by the theorems of Poincare and Perron
III	Elective III	DIFFERENTIAL GEOMETRY	Calculate the curvature and torsion of a curve. To find the osculating surface and osculating curve at any point of a given curve. Calculate the first and the second fundamental forms of surface. To calculate the Gaussian curvature, the mean curvature, the curvature lines, the asymptotic lines, the geodesics of a surface.
		FLUID DYNAMICS	Recognize and find the values of fluid properties and relationship between them and understand the principles of continuity, momentum, and energy as applied to fluid motions Identify these principles written in form of mathematical equations Apply dimensional analysis to predict physical parameters that influence the flow in fluid mechanics
		PROGRAMMING WITH C++	Get the knowledge of getting solution to mathematical problems with the help of C++
		NUMBER THEORY	Apply the Law of Quadratic Reciprocity and other methods to classify numbers as primitive roots, quadratic residues and quadratic non-residues. Formulate and prove conjectures about numeric patterns Produce rigorous arguments centered on the material of number theory, most notably in the use of Mathematical induction and the Well-Ordinary principle in the proof of theorems

IV	Elective IV	OPTIMIZATION TECHNIQUES	Formulate a real-world problem as linear programming and queuing models.
			Assess the existence and uniqueness of solutions and derive necessary and sufficient optimality conditions for a given optimization problem.
			Understand the mathematical tools that are needed to solve optimization problems.
		C++ PROGRAMMING LAB	Identify and develop decision making and inventory models from the verbal description of the real system
II	EDC	NUMERICAL & STATISTICAL METHODS	Understand the basic knowledge of one of the programming language of C++
			After successful completion of the course, the students will be able to apply these concepts to solve algebraic and transcendental equations, system of linear equations, evaluate derivatives and integrals using numerical techniques. Further, students will be able to analyze the given data with the help of the above statistical tools
		STATISTICS	Calculate Mean, Median and Mode in series of individual observations
			Find Discrete series, Continuous series.
			Calculate the first and the second fundamental forms of surface.
			Calculate the Range, Quartile deviation, Mean deviation about an average, Standard deviation

# DEPARTMENT OF COMPUTER SCIENCE

**Name of the Programme: Bachelor of Computer Science B.Sc (CS)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Specific Outcome(PSO):**

**After completion of the programme, the graduates will be able to**

PSO1	Apply domain knowledge and problem solving skills to solve real time problems.
PSO2	Acquire good employability skills which will ensure exceptional career opportunities in IT companies.
PSO3	Get a strong foundation to pursue higher education in the field of Computer Science/Applications.

**Name of the Programme: Bachelor of Computer Science B.Sc (CS)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Outcome(PO):**

**Upon completion of the degree requirements, students will be able to**

PO1	Understand the fundamental concepts of computer system, including hardware and software
PO2	Design and analyze precise specifications of algorithms, procedures and interaction behaviours
PO3	Apply the appropriate technologies, skills and tools in various fields of computer science
PO4	Analyze impacts of computing on individuals, organization and society

**COURSE OUTCOME(COs)**

**Name of the Programme: Bachelor of Computer Science B.Sc (CS)**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME				
I	Core - I	Problem Solving Through C	Recognize the basic Terminologies of C Programming				
			Understanding the statement structure and apply simple problems				
	Core - I	C programming Practicals	Understand and apply the pre-defined functions and user defined functions and then apply in simple problems				
			Demonstrate the operation of Structures and unions. Recognize the operation of Files				
II	Core - II	Data Structure and Algorithms	Study all the Basic Statements in C Programming. Practice the usage of branching and looping statements. Apply string functions and arrays usage. Analysis the use of pointers and files.				
			Core - II	Data Structure Using C Practicals	Remember the concept of algorithms. Understanding the stack and queues. Apply linked list for other data structures. Evaluate the trees and sorting methods. Analyze the sorting and file organizations.		
					Core - III	Computer Organization and Architecture	Study all the Basic operation of matrices and stack. Practice the usage of branching and looping statements in hash table. Apply arrays for stack and queue. Analysis the use of pointers for linked list, doubly linked list and tree traverse.
							Core - IV
	Core - IV	SQL and PL/SQL Practicals					
			Core - V	Computer Network			
					Remember the concept of networks and its types. Understanding the wireless communications.		
					Understand and Apply data link protocols. Evaluate the network design issues.		
	Analyze the connection issues.						

IV	Core - VI	Programming in java	Remember the concepts of OOPS. Understand the basic Terminologies of languages and statements. Demonstrate the use classes and objects. Evaluate the packages and exception handling methods. Analyze the I/O Streams and graphics classes.
	Core - VI	Java Programming Practicals	Study all the Basic Statements in java Programming. Practice the usage of branching and looping statements. Apply Packages and Interfaces. Analysis the use of graphics tools in JAVA.
IV	Allied - II	Computer Applications in Office	Remember the basics of MS word. Understand MS word. Demonstrate the functions of MS excel. Study the basics of MS excel workbooks. Analyze of data processing with MS power point.
IV	Allied - II	Office Automation Lab	Understand the features in MS Word. Select and apply worksheet and functions in MS EXCEL. Combine multiple features in MS POWER POINT to prepare presentations
III	NMEC	Computer Application for Automation	Remember the basics of computers. Understand MS word. Demonstrate the functions of MS excel. Study the basics of MS power point. Analyze data processing with MS Access.
IV	NMEC	Basic of Internet	Remember the basics of Internet. Understand internet technologies. Demonstrate tags in HTML. Study the basics of create list and tables. Analyze frames and forms.

**Name of the Programme: Bachelor of Computer Science B.Sc (CS)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2019 onwards**

**Programme Specific Outcome(PSO):**

**After completion of the programme, the graduates will be able to**

PSO1	Solve real time problems by applying domain knowledge and problem solving skills
PSO2	Acquire good employability skills which will ensure exceptional career opportunities in IT companies.
PSO3	Purse higher education in the field of Computer Science/Applications

**Programme Outcome(PO):**

**Upon completion of the degree requirements, students will be able to**

PO1	To understand the fundamental concepts of computer system, including hardware and software
PO2	To design and analyze precise specifications of algorithms, procedures and interaction behaviours
PO3	To apply the appropriate technologies, skills and tools in various fields of computer science
PO4	To analyze impacts of computing on individuals, organization and society

**COURSE OUTCOME**

**Name of the Programme: Bachelor of Computer Science B.Sc (CS)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2019 onwards**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
	Core - VI	GUI Programming	Understand the Introduction of Visual Basic Understands the Variables, Constants and procedures Remembers Menus, Sub procedures and sub functions Analyse the use of List Boxes and Combo boxes Understands to access Database Files
	Core - VII	Operating Systems	Studies th history of operating system Understands the Processes and Threads Applies Scheduling and memory management techniques Understanding the deadlocks Remembering the principles of I/O hardware

V	Core - VIII	Computer Networks	Understand the : OSI Reference model
			Understand the Data Link Layer
			Understand the Network Layer
			Understand the Transport Layer
			Understand the Application Layer
Elective - I	Problem Solving Techniques	Study all the Basic commands.	
		Practice the usage of shell script for system configuration.	
Core Practical - V	Practical - V:Programming in VB	Applies various effects piping and redirection process.	
		Analysis the use of shell script for simple process.	
		Writes program using loops and decision making statements	
		Practice the creation of menu and MDI Form	
SBEC - III	Practical-Shell Programming	Applies Common Dialog Control and to open, edit and save text file	
		Applies the ADO concept with database	
		Remembers the shell scripts to implement file commands	
		Understands to write a shell script for displaying current date, user name, file listing and directories	
		Writes shell script for simple arithmetic operations	
SBEC - IV	Multi Skill Development	Writes shell script with looping statements	
		Writes shell script for file handling	
		Remembers the the way of communication.	
		Analyse numerical aptitude	
VI	Core - IX	Understand critical reasoning	
		Remembers to give self introduction	
		Practice group discussion	
		understands the Java program structure	
	Core - X	Software Engineering	Practice the usage of control flow statements.
			Applies usage of Arrays, Strings and Vectors
			Analyse the use of Multithreaded Programming
			Analyse the use of Graphics Programming
	Elective - II	Date Mining and Warehousing	understands the Software Life Cycle Models
			Remembers the Requirements Analysis and Specification
Understands DFD and UML diagrams			
Applies User Interface Design			
Elective - III	Computer Graphics	Understands the Software Reliability and Quality Management	
		Remember the basic concepts of data mining and data preprocessing.	
		Understanding the data mining primitives.	
		Applies mining association rule.	
Core Practical - VI	Programming in Java	Evaluate classification and Prediction.	
		Implement cluster analysis.	
		Remember the basic concepts of Graphics system.	
		Understanding scans system and I/O Devices.	
V	SBEC - V	Applies 2D Transformations.	
		Evaluate 3D Transformations.	
		Implement visual surface techniques.	
		Applies the concept of member Overloading to develop program	
		Develops programs using class and objects	
VI	SBEC - VI	Develops programs using Exception Handling	
		Applies the cocept of multi threading for prorams	
		Develops programs using the concepts files	
		Apply various filter effects to an image.	
		Designs a web page layout.	
SBEC - V	Practical-Image Editing Tool	Understands to Create a Database Table	
		Converts Black and White Photo to Color Photo	
		Practices a text with an appropriate image	
		Understands Basic of Coding in PHP	
SBEC - VI	PHP Scripting Language	Understands to Upload Files to Website	
		Understands Creating a Database Table	
		Remembers System Planning	
		Understands Mailing List Software	

Name of the Programme: Master of Computer Science M.Sc (CS) For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards			
<b>Programme Specific Outcome(PSO):</b>			
PSO1	An ability to apply profound knowledge to analyze and design software and system containing hardware and software components of varying complexity		
PSO2	Acquire good employability skills which will ensure exceptional carrier opportunities in IT companies		
PSO3	Get a strong foundation to pursue research in the field of computer science / application		
PSO4	To acquire ability to function in multi disciplinary domains		
PSO5	An ability to apply mathematical model algorithmic principles and computer science theory in the design of real time applications		
<b>Programme Outcome(PO):</b>			
PO1	Understand the advanced concepts of computer system, including hardware and software		
PO2	Through and up-to-date knowledge in the particular field and adequate skill for problem solving		
PO3	Apply the appropriate technologies, skills and tools in various IT fields of computer science		
PO4	Develop system softwares, application softwares and web applications		
PO5	Attain ability to exercise research intelligence in investigations and innovations		
<b>COURSE OUTCOME(CO)</b>			
Name of the Programme: Master of Computer Science M.Sc (CS) For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards			
I	Core - I	Design and Analysis of Algorithms	It gives stepwise procedure to solve problems The problems can be broken down into small pieces for program development Efficient approach of solving problems by a model of computations
	Core - II	Distributed Operating System	Clear understanding on several resource management techniques like distributed shared memory and other resources Knowledge on mutual exclusion and Deadlock detection of Distributed operating system Able to design and implement algorithms of distributed shared memory and commit protocols Able to design and implement fault tolerant distributed systems
	Core - III	Advanced Java Programming	Able to develop a Graphical User Interface (GUI) with Applet and Swing Develop a Client-Server Application with Database Maintenance
	Core - IV	Internet of Things	Gain the basic knowledge about IoT and they will be able to use IoT related products in real life It helps to rely less on physical resources and started to do their work smarter
	Core - V	Lab - I - Advanced Java Programming	learn the Internet Programming, using Java Applets apply event handling on AWT and Swing components. learn to access database through Java programs, using Java Data Base Connectivity (JDBC) create dynamic web pages, using Servlets and JSP
	Core - VI	Lab - II - Algorithms Using C++ Lab	Choose appropriate data structures to represent data items in real world problems Developing 8-Queens and Knapsack Problem using Backtracking Analysing the solution of Traveling Salesperson Problem using Branch and Bound technique.
II	Core - VII	Advanced Web Technology	Design a web page with Web form fundamentals and web control classes Recognize the importance of validation control, cookies and session Apply the knowledge of ASP.NET object, ADO.NET data access and SQL to develop a client server model Recognize the difference between Data list and Data grid controls in accessing data
	Core - VIII	Compiler Design	Use the knowledge of patterns, token & regular expressions for solving a problem
	Core - IX	Data Mining	Basic data mining concepts for solving real world problems
	Core - X	Lab - III Web Technology Lab	Ability to design and implement static and dynamic website Build Web Pages using ASP.NET Develop a web pages using web service for accessing database.
	Core - XI	Lab - IV Data Mining Lab	Ability to understand the various kinds of tools Demonstrate the classification, clustering and etc. in large data sets Ability to add mining algorithms as a component to the existing tools. Ability to apply mining techniques for realistic data.
III	Core - XII	Open Source Computing	Basics of Python programming for writing programmes for the real world problems
	Core - XIII	Digital Image Processing	Review the fundamental concepts of a digital image processing system and Analyze images in the frequency domain using various transforms Evaluate the techniques for image enhancement and image restoration. Categorize various compression techniques Interpret Image compression standards, and Interpret image segmentation and representation techniques Gain idea to process various image used in various fields such as weather forecasting, Diagnosis of various disease using image such as tumor, cancer etc.
	Core - XIV	Big Data Analytics	Able to apply Hadoop ecosystem components Able to participate data science and big data analytics projects
	Core - XV	Digital Image Processing Lab	Review the fundamental concepts of a digital image processing system. Evaluate the techniques for image enhancement and image restoration. Categorize various compression techniques Interpret image segmentation and representation techniques.
IV (Option I)	Core - XVI	Machine Learning	Have a good understanding of the fundamental issues and challenges of machine learning: data, model selection, model complexity, etc Have an understanding of the strengths and weaknesses of many popular machine learning approaches Appreciate the underlying mathematical relationships within and across Machine Learning algorithms and the paradigms of supervised and un supervised learning Be able to design and implement various machine learning algorithms in a range of real-world applications
	Core - XVII	Project Work and Viva-Voce	Demonstrate knowledge in the program domain Present his views cogently and precisely Exhibit professional etiquette suitable for career progression

IV (Option II)	Core - XVIII	Project Work and Viva-Voce	Demonstrate knowledge in the program domain
			Present his views cogently and precisely
			Exhibit professional etiquette suitable for career progression
I	Elective Course – I	Advanced Computer Architecture	Parallel computer architecture, design and micro-operations
			Interconnection of networks and synchronization mechanism
			Develop design skills of Instruction Sets
II	Elective Course – II	Advanced database management system	Know about the Various Data models and Works on Database Architecture
			Knowledge patterns, Object Oriented Databases are well equipped
			A good understanding of cloud computing and a systematic knowledge of the fundamental technologies, architecture, and security
III	Elective Course – III	Cloud Computing	
IV	Elective IV	Mobile Computing	Able to explain the basics of mobile system
			Able to develop mobile application
			Understand the Mobile Adhoc networks and its routing
V	Elective V	Cryptogrphy and Network Security	Understand the different types of security features
			Understand the fundamentals of networks security, security architecture, threats and vulnerabilities
			Apply the different cryptographic operations of symmetric cryptographic algorithms
II	EDC	E – Commerce	Apply the different cryptographic operations of public key cryptography
			Apply the various Authentication schemes to simulate different applications.
			Understand various Security practices and System security standards
II	EDC	E – Commerce	Learning the introduction on e-commerce
			Understanding the mercantile and consumer process models
			Analysing the consumers and merchant's perspective on e-commerce
II	EDC	E – Commerce	Getting an idea on Electronic Data Interchange
			Gaining the knowledge on Internet



**Name of the Programme: Bachelor of Computer Applications (BCA)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Specific Outcome(PSO):**  
**After completion of the programme, the graduates will be able to**

PSO1	Acquire Knowledge and Problem Solving skills to solve Real time problems.
PSO2	Obtain good employability skills that will ensure world wide opportunities.
PSO3	Get a strong foundation to pursue Higher education in the field of Computer Applications

**Name of the Programme: Bachelor of Computer Applications (BCA)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Outcome(PO):**  
**Upon completion of the degree requirements, students will be able to**

PO1	To understand the fundamental concepts of computer system.
PO2	To Design and analyze precise specifications of algorithms and interaction behavior.
PO3	To apply the technologies in various fields of Computer Applications.
PO4	To communicate effectively in both verbal and written form in industry and society.

**COURSE OUTCOME(CO)**

**Name of the Programme: Bachelor of Computer Applications (BCA)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
I	Core - I	Problem Solving Through C	Recognize the basic Terminologies of C Programming. Understanding the statement structure and apply simple problems. Understand and apply the pre-defined functions and user defined functions. Demonstrate the operation of Structures and unions. Recognize the operation of Files.
	Core - I	Practical : C programming	Study all the Basic Statements in C Programming. Practice the usage of branching and looping statements. Apply string functions and arrays usage. Analysis the use of pointers and files.
II	Core - II	Object Oriented Programming Concepts Using C ++	Recognize the Basic Terminologies of loops. Understanding the classes and objects. Understand and apply the over loading, Inheritance and then apply the simple problems. Demonstrate the pointers. Recognize the operation of Files.
	Core - II	Practical : C++ Programming Lab	Understand the features in OOPS. Select and apply proper statement relative to problems. Combine multiple features in C++ to implement complex problems.
III	Core - III	Computer Organization and Architecture	Recognize the Basic Number system and logic gates. Understanding the flip flops and Karnaugh maps. Understand and apply micro operation and data transfer. Demonstrate the computer arithmetic and addressing modes. Analyze the memory and I/O organizations.
	Core - IV	Data Structures and Algorithms	Remember the concept of algorithms. Understanding the stack and queues. Apply linked list for other data structures. Evaluate the trees and sorting methods. Analyze the sorting and file organizations.
	Core - V	Operating System	Understand the structure and functions of Operating System. Compare the performance of Scheduling Algorithms. Understand and organize the memory. Evaluate the deadlock measures. Analyze the I/O hardware and software.
	Core - VI	Relational Database Management System	Remember the concept of Database. Understanding the data models and ER Diagram. Apply SQL commands. Evaluate the DBMS in SQL. Analyze the Transaction management.
	Core - VI	Practical : PL/SQL	To impart Practical Training in DDL Commands. Familiarize the different DML Commands. Build queries with SQL Commands. Provide knowledge on working with big tables.

	SBEC-I	Office Automation Lab	To acquire knowledge on editor, spread sheet and slide preparation. To improve creative thinking in presentation software.
IV	Core - VII	Computer Network	Remember the concept of networks and its types.
			Understanding the wireless communications.
			Understand and Apply data link protocols.
			Evaluate the network design issues.
	Core - VIII	Programming in Java	Analyze the connection issues.
			Remember the concepts of OOPS.
			Understand the basic Terminologies of languages and statements.
			Demonstrate the use classes and objects.
	Core - VIII	Practical : Java Programming	Evaluate the packages and exception handling methods.
			Analyze the I/O Streams and graphics classes.
			To impart Practical Training in JAVA Programming Language.
			Familiarize the different control and decision making statements in JAVA.
Core - IX	Software Engineering	Build programs using Packages.	
		Provide knowledge on working with Exception handling functions.	
		Remember the basics of software engineering and models.	
		Understand requirement and Analysis.	
			Demonstrate the functions of software design.
			Study the object modeling.
			Analyze testing technologies.

**Name of the Programme: Bachelor of Computer Applications (BCA)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2019 onwards**

**Programme Specific Outcome(PSO):**

**After completion of the programme, the graduates will be able to**

PSO1	Develop Knowledge and Problem Solving skills to solve Real time problems.
PSO2	Acquire good employability skills that will ensure world wide opportunities
PSO3	Get a strong foundation to pursue Higher education in the field of Computer Applications

**Programme Outcome(PO):**

**Upon completion of the degree requirements, students will be able to**

PO1	To understand the fundamental concepts of computer system, including hardware and software
PO2	To design and analyze precise specifications of algorithms, procedures and interaction behaviours
PO3	To apply the appropriate technologies, skills and tools in various fields of computer science
PO4	To analyze impacts of computing on individuals, organization and society

**COURSE OUTCOME(CO)**

**Name of the Programme: Bachelor of Computer Applications (BCA)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2019 onwards**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
V	Core - IX	Web Technologies	Understand the PHP concepts.
			Practice looping and Conditional Statements.
			Applies the concept of Arrays.
	Core - X	Problem Solving Techniques	Understand the Functions and Classes.
			Working with Database and SQL.
			Remember the concept of Problem Solving.
	Core - XI	Java Programming	Analyzing the algorithm with practical programs.
			Evaluate Factoring methods.
			Understanding the Array Techniques.
	Core - XI	Practical : Programming in Java	Implement the concepts of Merging, Sorting and Searching.
			Understands the Java program structure.
			Practice the usage of control flow statements.
Elective - I	Computer Graphics	Applies usage of Arrays, Strings and Vectors.	
		Analyse the use of Multithreaded Programming.	
		Analyse the use of Graphics Programming.	
SBEC - III	Practical - Image Editing Tool	Applies the concept of member Overloading to develop program.	
		Develops programs using class and objects.	
		Develops programs using Exception Handling.	
SBEC - IV	Multi Skill Development	Applies the concept of multi threading for programs.	
		Develops programs using the concepts files.	
		Remember the basic concepts of Graphics system.	
			Understanding Video display and I/O Devices.
			Applies 2D Transformations.
			Evaluate 3D Transformations.
			Implement visible surface detection techniques.
			Apply various filter effects to an image.
			Designs a web page layout.
			Understands to Create a Database Table.
			Converts Black and White Photo to Color Photo.
			Practices a text with an appropriate image.
			Remembers the the way of communication.
			Analyze Numerical aptitude.
			Understand Critical reasoning.
			Understanding Verbal reasoning.
			Practice Group discussion.

VI	Core - XII	GUI Programming	Understand the Introduction of Visual Basic. Understands the Variables, Constants and procedures. Remembers Menus, Sub procedures and sub functions. Analyse the use of List Boxes and Combo boxes. Understands to access Database Files.
	Core - XII	Practical : Programming in VB	Understand the features in VB. Select and apply statements for design forms. Working with menu editor. Design forms with data control, Adode Control. Program to implement Data grid control.
	Core - XIII	Computer Networks	Understand the concept of networks. Evaluating problems in error Detection and Correction. Understand the Network Layer. Understand the Transport Layer. Analyze encryption and decryption algorithm.
	Elective - II	Software Testing	Building a Software testing strategy. Understand the types of Testing. Analyze the verification and validation test results. Performing the case study on testing.
	Elective - III	Date Mining and Warehousing	Understand the Web based application. Remember the basic concepts of data mining and data preprocessing. Understanding the data mining primitives. Applies mining association rule. Evaluate classification and Prediction. Implement cluster analysis.
V	SBEC - V	Practical : Android Programming	Understand the Basic tools. Develop knowledge on working with simple Android apps. Practice the usage of control panel Objects. Analyze the use of SQLite I. Creation of Google map in Android.
VI	SBEC - VI	Shell Programming	Understand the concept of Shell commands. Working with Files & Directories. Usage of variables with sample commands. Remembers the shell script to implement file commands. Develop shell script for reading and printing data.

# DEPARTMENT OF BIOCHEMISTRY

Name of the Programme: Bachelor of Biochemistry B.Sc (BC)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards

Programme Specific Outcome(PSO):

After completion of the programme, the graduates will be able to

PSO1	The student will be able to understand characterisation biomolecules in research.
PSO2	Students will understand the concept of spectrophotometer, relevant terms of uv-visible spectroscopy and outline of uv spectroscopy device.
PSO3	Students will learn basics of enzymology and will be familiar with important terms of enzymology.
PSO4	Students will learn different types of fermentation process, strain improvement methods and isolation of industrial important microorganisms.
PSO5	They will be able to describe the mechanisms of protein transport to various sub cellular sites and process of protein degradation.
PSO6	Learn to work as a team as well as independently to retrieve information, carry out Research investigations and result interpretations.
PSO7	Develop the ability to understand and practice the ethics surrounding scientific Research.
PSO8	Realize the impact of science in society and plan to pursue their research.
PSO9	After completion of the program the students are well poised to pursue careers in academic and industry in the areas of pharmaceutical and biotechnology.
PSO10	Health care professionals for services in the fields of clinical biochemistry, laboratory management, hospital and community services.
PSO11	The students will be able to demonstrate practical skills in handling biological specimens, analysis and their safe disposal.

Name of the Programme: Bachelor of Biochemistry B.Sc (BC)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards

Programme Outcome(PO):

PO1	Ability to understand fundamental concepts of Biochemistry
PO2	Ability to listen to and follow scientific viewpoints and engage with them.
PO3	Ability to closely observe the situation, and apply lateral thinking and analytical skills.
PO4	Ability to analyse, interpret and draw conclusions from quantitative/qualitative data
PO5	Ability to use digital sources, and apply various platforms to convey and explain concepts of Biochemistry

COURSE OUTCOME(CO)

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
I	Core - I	Basic of Biochemistry	Summarize structures, isomerism and functions of different types of carbohydrates. Understand the nature of amino acids and proteins with their structure and their roles Demonstrate about the lipids and lipoproteins along with their role. Explain the structure and properties of Nucleic acids and Nucleoproteins Describe about source and importance of Vitamins
II	Core - II	Tools of Biochemistry	Illustrate the cell fractionation techniques and clarify about the microscope handling. Disclose the chromatographic techniques for the separation components Explain the principles of centrifugation techniques for the separation of components Understand basic principles behind electrophoretic and spectroscopic techniques Describe about the measurement and the applications of radioisotopes
II	Core-I	Practical-I	Facilitate the learners to prepare solutions for biochemical experiments Make the students to prepare buffer solution and to know the preparation of pH solution Prepare crude macromolecules like starch, casein etc Facilitate the learners to correctly identify the carbohydrates, aminoacids and lipids Quantify the biomolecules
III	Core - III	Enzymes	Understand the basic features and classification of enzymes Figure out the characteristics of active site and nature of enzyme catalysis Understand the enzyme kinetics, enzyme inhibition and enzyme regulation with relevant examples Demonstrate the coenzymes, allosteric enzymes and multienzyme complex Explain the various immobilization techniques and application of enzymes in different fields
IV	Core - IV	Intermediary Metabolism	Understand the basic principles of metabolic pathways Comprehend carbohydrate metabolism and its regulation Give the big picture about the biological oxidation process Comprehend the concepts of lipid metabolism and amino acid metabolism and urea cycle Understand concepts of nucleotide metabolism nucleic acid metabolism
	Core-II	Practical-II	Know about analytical techniques of separation of sugar, aminoacids lipids and plant pigments Analyse the biomolecules by colorimeter Analyse the enzyme assay

III	SBEC-I	Cell Biology	Understand the structure and function of different types of cell
			Succeed in understanding structural organization and role different organelles
			Expound the chromosomal organization.
			Analyze cell cycle and types of cell division
IV	SBEC-II	Plant Biochemistry	Describe the role of extracellular matrix and cell interactions
			Understand the plant cell physiology.
			Comprehend process of photosynthesis and photorespiration
			Demonstrate nitrogen fixation in plants
I	Allied-I	Biochemistry-I	Illustrate about the plant growth through seed germination and seed dormancy
			Explain hormones and secondary metabolites of plants
			Describe structures, properties and functions of carbohydrates.
			Understand the structures, properties and role of amino acids and proteins
II	Allied-II	Biochemistry-II	Describe the nomenclature and identify the classes of enzymes and factors affecting their action with kinetics
			Demonstrate about the structure and properties of lipids and Nucleic acids with their importance
			Describe about source, importance and deficiency disorders of vitamins and minerals
			Understand the basics of acid - base balance of human body and gain
II	Allied Practical-I	Biochemistry Practical	Develop competence in handling various chromatographic techniques
			Describe carbohydrate metabolism and gain knowledge about Diabetes mellitus.
			Learn basic concepts of Bioenergetics, mechanisms of oxidative phosphorylation
			Describe the concepts of lipid metabolism and amino acid metabolism
III	NMEC-I	Paper-I Fundamentals of Human Physiology	Gain knowledge about the basic terminologies, classification and mechanism of action of hormones and to demonstrate various types of second messengers.
			Analyse biomolecules for qualitative study
			Learn about biochemical preparation carbohydrates, proteins and lipids
			Quantify the biomolecules
III	NMEC-I	Paper-II Biochemistry in Nutrition	Experiment chromatography techniques
			Describe about digestion and absorption process of biomolecules
			Grasp the respiratory system and mechanism of exchange of gaseous.
			Gain awareness on cardiovascular system, structure and functioning of heart
IV	NMEC-II	Paper-II Biochemistry and Health	Understand the urine formation and excretion through kidney.
			Obtain an imminent knowledge about nervous system.
			Describe the nutritional profile of various foods and the role of biomolecules, fiber and antioxidants.
			Describe the techniques to measure energy expenditure and BMR; RDA for various disorders.
IV	NMEC-II	Paper-II Biochemistry in Diagnosis	Understand the recommended dietary allowances for different age group people.
			Gain awareness on drug – nutrient interactions, food allergy and importance of nutraceuticals.
			Obtain an impending knowledge about nutritional therapy for various metabolic disorders.
			Summarize the sources, importance of carbohydrates and gain awareness about Diabetes mellitus.
IV	NMEC-II	Paper-II Biochemistry in Diagnosis	Understand the importance of proteins in living organism with their deficiency disorders.
			Describe the sources and importance of lipids along with the disorders of lipid metabolism.
			Explain the sources, RDA, importance and deficiency disorders of vitamins.
			Describe about sources and biological importance of minerals
IV	NMEC-II	Paper-II Biochemistry in Diagnosis	Summarize the use of standard precautions applied in clinical laboratory and during the collection, processing, preservation and transportation of biological specimens for analysis.
			Gain knowledge of the normal composition of blood and their analysis along with their significance in maintaining good health
			Become skilled at performing clinical urine tests for diagnostic purposes and Identify abnormal constituents of urine.
			Describe physical, chemical and microscopic examination of stool and analysis of its constituents using standard procedures.
IV	NMEC-II	Paper-II Biochemistry in Diagnosis	Become aware with the variations in the levels of biochemical components of blood and their relationship with various diseases and also get acquainted with the role of enzymes in diagnosis of a variety of diseases

**Name of the Programme: Bachelor of Biochemistry B.Sc (BC)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2019 onwards**

**Programme Specific Outcome(PSO):  
After completion of the programme, the graduates will be able to**

PSO1	Students will learn different types of fermentation process, strain improvement methods and isolation of industrial important microorganisms.
PSO2	Learn to work as a team as well as independently to retrieve information, carry out Research investigations and result interpretations.
PSO3	Develop the ability to understand and practice the ethics surrounding scientific Research.
PSO4	After completion of the program the students are well poised to pursue careers in academic and industry in the areas of pharmaceutical and biotechnology.
PSO5	Health care professionals for services in the fields of clinical biochemistry, laboratory management, hospital and community services.

**Name of the Programme: Bachelor of Biochemistry B.Sc (BC)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2019 onwards**

**Programme Outcome(PO):**

**Upon completion of the degree requirements, students will be able to**

<b>PO1</b>	Ability to analyse, interpret and draw conclusions from quantitative/qualitative data
<b>PO2</b>	Ability to participate constructively in class room discussions and ability to contribute to group work
<b>PO3</b>	Overall knowledge of the avenues for research and higher academic achievements in the field of Biochemistry
<b>PO4</b>	Ability to interrogate one's own ethical values and to be aware of ethical and environmental issues

**Name of the Programme: Bachelor of Biochemistry B.Sc (BC)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2019 onwards**

	STUDY COMPONENTS	COURSES	COURSE OUTCOME
V	Core - V	Clinical Biochemistry	Understand clinical aspects of biochemistry Describe about the blood components, blood coagulation system and Perform the hematology-based analysis. Acquire insight into disorders of carbohydrates and lipids metabolism Gain knowledge about various disorders of protein, nucleic acid and bilirubin metabolism Comprehend different organ function tests and clinical enzymology
V	Core - VI	Molecular Biology	Understand the replication process Comprehend basic principles and mechanism of transcription Understand translation process and post translational modification of proteins Understand the protein targeting and processing and regulation of gene expression in prokaryotes Understand types and causes of mutation, and DNA repairing mechanisms
V	Core - VII	Human Physiology	Illustrate about digestive secretions and absorptive mechanisms Comprehend the process of gaseous exchange in tissues and lungs Obtain an insight about muscle physiology and cardiovascular system Understand urine formation and physiology of reproductive system Get an idea about neuron structure and sensory physiology
V	Elective - I	Nutritional Biochemistry	Describe energy content of various foods and nutritional significance of different biomolecules Understand nutritional requirements and techniques to measure energy expenditure Explain the effect protein energy malnutrition Describe nutritional requirement, significance and deficiency disorders of dietary minerals Obtain an insight about Regulation and standardization of foods in food industry
V	Core Practical -III	Practical - III	Estimate and identify the hematological parameters Experiment the assay of serum marker enzymes Analyse the blood parameters like urea, bilirubin cholesterol etc Experiment urine samples
V	SBEC - III	Genetic Engineering	Get an idea about the role of DNA manipulative enzymes and restriction enzymes used in rDNA technology. Advance their knowledge about the vectors suitable for rDNA technology Understanding of various methods adapted for gene transfer and screening of recombinants Obtain knowledge about advance techniques in genetic engineering Understand applications of rDNA technology in various fields
VI	Core - VIII	Immunology	Understand basics of immune system and about the cells and organs of immune system. Describe the Antigen and Antibody structure and properties and obtain the knowledge about the hybridoma technology Comprehend the antigen and antibody reactions and immunological techniques. Get a clear idea about the immunization and hypersensitivity reactions. Familiarize with complement system, autoimmunity and immunodeficiency disorders
VI	Core - IX	Endocrinology	Gain knowledge about the basic terminologies, classification and mechanism of action of hormones and to demonstrate various types of second messengers and their action. Understand hypothalamic and pituitary hormones. Learn various functions of thyroid, parathyroid and pancreatic hormones along with their mechanism of action. Demonstrate the biological functions and dysfunction of various GI tract hormones as well as adrenal gland hormones. Understand about the male and female reproductive hormones and also gain the knowledge about some local hormones.

VI	Core - X	Pharmaceutical Biochemistry	<p>Understand drug dosage, routes of administration and about bioavailability of drugs</p> <p>Understand about basic principles involved in pharmacokinetics.</p> <p>Understand about the drug receptor interactions and gain knowledge on metabolism.</p> <p>Describe the general principles of adverse drug reactions and acute poisoning.</p> <p>Advance the knowledge on drug discovery process and ethical issues in drug discovery process and in preclinical toxicological studies.</p>
VI	Elective - II	Microbial and Industrial Biochemistry	<p>Learn about the culture techniques for isolation of microbes from various sources and preserve the isolates.</p> <p>Gain basic knowledge about basic principles of fermentation and types of fermenters.</p> <p>Describe the microbial production of bioactive compounds such as organic acids, bacterial and fungal polysaccharides, antibiotics and vitamins.</p> <p>Learn about Industrial production of alcohol, alcoholic beverages, production of Single Cell Protein, bioethanol and biogas production.</p> <p>Provide fundamental insights to exploit microbes for protecting environment.</p>
VI	Core Practical - IV	Practical -IV	<p>Demonstration on PTC media preparation ,and callus induction</p> <p>Experiment the genetic engineering protocols</p> <p>Investigate on immunological experiments</p> <p>Experiment and interpret the microbiological experiments</p>
VI	SBEC - IV	Bioinformatics and Nanotechnology	<p>Understand basic principles and applications of bioinformatics in lifescience and get trained in database searching.</p> <p>Acquire knowledge of biological databases for the sequence alignments and predicting the structures of biomolecules such as nucleic acids and proteins.</p> <p>Describe the different tools available for sequence alignment and and predicting the structures</p> <p>Describe the different tools available for sequence alignment and and predicting the structures.</p> <p>Describe history of nanotechnology, Properties of nanoparticles, types, synthesis of nanoparticles and the characterization of nanoparticles using Microscopy techniques such as SEM, TEM, AFM, STM.</p>

Name of the Programme: Master of Biochemistry M.Sc (BC)	
Programme Specific Outcome(PSO):	
PSO1	To acquire necessary knowledge and skills in core themes, principles and components of basic
PSO2	To demonstrate the knowledge of biochemical processes from the cellular and molecular
PSO3	To Integrate and apply the techniques studied and to compare and contrast the depth of
PSO4	To be able to understand, analyze and apply the studied basic and concepts in wide variety of
PSO5	To provide students with the knowledge and skill base that would enable them to go for self-
Programme Outcome(PO):	
PO1	Biochemistry will provide students with the necessary knowledge and skills to undertake a career in research, either in industry or in an academic setting.
PO2	The training provided will give students the breadth and depth of scientific knowledge in Biochemistry.
PO3	On completion of the programme, students will be qualified to apply for a PhD or to gain employment in the pharmaceutical or biotechnology industries, which are among
PO4	The programme will be based on a combination of taught modules, independent learning and an extended research project to be carried out either in the University departments
PO5	The programme incorporates a substantial element of hands-on research experience, with enhanced experimental skills being gained alongside experienced research workers.

**Name of the Programme: Master of Biochemistry M.Sc (BC)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

COURSE OUTCOME			
<b>I</b>	Core - I	Biomolecules	<p>To learn about the structure, properties and functions of polysaccharides</p> <p>Illustrate on structure, properties and functions of lipids, interactions of lipids in biological membrane.</p> <p>Determine the classification, properties and significance of proteins</p> <p>Understand about the DNA properties and functions, biological importance of histone proteins</p> <p>To describe the significance of vitamins and its antioxidant activity, minerals of biological significance</p>
	Core - II	Advanced Enzymology	<p>Distinguish the fundamentals of enzyme properties, nomenclatures, characteristics and Compare methods for production, purification, characterization of enzymes</p> <p>To derive the equations of Enzyme kinetics. Discuss the factors affecting enzymatic reactions. Mechanism of enzyme catalysis and structure and functions of coenzymes</p> <p>Describe the concepts of co-operative behavior, enzyme inhibition and allosteric regulation.</p> <p>To know the methods for production, purification, characterization and immobilization of enzymes. Describe the multi enzyme complex with example. To know about the biosensors and its functions.</p> <p>Describe the major applications of enzymes in industry, understand the principles of enzyme immobilization techniques and enzyme extraction procedures.</p> <p>Discover the current and future trends of applying enzyme technology for the commercialization purpose of biotechnological products.</p>
	Core - III	Cell and Molecular Biology	<p>To know about the tissue types, organization and classes of cell junctions and describe the role of cell adhesion molecules and ECM components.</p> <p>To understand what happens during the cell cycle and cell death and explain about membrane transports and checkpoints in the cell cycle.</p> <p>To understand the basic structures, properties and organization of eukaryotic and prokaryotic chromosomes</p> <p>To emphasize the molecular mechanism of DNA replication and recombination involved in eukaryotes and prokaryotes.</p> <p>To deeply understand the transcription process in prokaryotes and eukaryotes.</p> <p>To know about the translation and post translational modification in prokaryotes and eukaryotes</p> <p>To learn the changes and consequences in chromosome structure and its related disorders, thereby know how the DNA repair mechanism by anticancer therapeutics involved against DNA mutation and uncontrolled cell growth.</p>
	Core Practical - I	Lab Course- I	<p>Learn how to standardize the biochemical tests.</p> <p>Can perform chromatographic techniques.</p> <p>Separate sugars and amino acids by Paper chromatography</p> <p>Can perform titrations.</p> <p>Isolate glycogen from tissues</p>
	Core Practical - II	Lab Course- II	<p>To determine the enzyme activity.</p> <p>Immobilize the enzymes by different methods</p> <p>To learn the kinetic studies of the enzymes.</p>
	<b>II</b>	Core - IV	Intermediary Metabolism
Core - V		Genetic Engineering and Cancer Biology	<p>To explain the basic techniques in gene manipulation and various enzymes used in gene transfer.</p> <p>To analyze on basic characteristic features and significance of cloning vectors, gene transfer methods and various cloning techniques.</p> <p>To depict on the significance and applications of recombinant DNA technology.</p> <p>To pertain on Overview of cell cycle, cell growth, tumors, cancers and isolation techniques</p> <p>To describe on carcinogenesis</p>
Core Practical - III		Lab Course - III	<p>Do the experiment of plant tissues culture.</p> <p>Qualitatively analyse the phytochemicals in medicinal plants.</p> <p>Estimate the major secondary metabolites.</p>
Core Practical - IV		Lab Course - IV	<p>Isolate DNA and RNA from different sources</p> <p>Estimate DNA and RNA</p> <p>Learn the techniques of Molecular Biology</p>
	Core - VI	Advanced Clinical Biochemistry	<p>Understand the collection and analysis of blood and urine samples</p> <p>Understand the role of carbohydrates and lipid metabolism in various diagnostic and therapeutic approaches.</p> <p>Have a clear knowledge about inborn error and hereditary defects in amino acids metabolism.</p> <p>Know about the gastric function test for diagnosis and therapeutic complications.</p> <p>To differentiate blood tests that are used to evaluate renal function test and liver functions.</p> <p>Know in detail about the disorders of mineral metabolism and Erythrocyte metabolisms</p>
	Core - VII	Concepts of Immunology	<p>Understand the humoral and cell mediated immunity.</p> <p>Know the primary and secondary lymphoid organ.</p> <p>Describe the theories of antibody formation and factors influencing antibody production.</p> <p>Learn the types of transplantation and understand how its malfunction linked with autoimmune disease and hyper sensitivity.</p>

III			Understand the active and passive immunization and learn how to make recombinant vector vaccines. Clear knowledge about the agglutination and precipitation techniques involved in research level.
	Core - VIII	Pharmaceutical Biochemistry and Toxicology	Understand clearly about the basic concepts of pharmacology Have a thorough knowledge about the mechanism of drug action, Drug interaction, Receptors. Know the aspects of New discovery of drugs and drug designing. Recognize the principles of toxicology, Antidotes and the management of poisoning.
	Core - IX	Biostatistics and Research Methodology	On completion of the course, students are able to understand about biostatistics, bioethics, IPR and legal protection, patent filing and infringement and biosafety. Understand the sample, population and statistical inference. Gain knowledge about concept, philosophical consideration and epistemology of science, ethical terms, principles and theories of bioethics
	Core Practical - V	Lab Course - V	Learn the techniques of hematology. Estimate the blood constituents. Determine the activity of enzymes. Estimate the constituents of urine sample.
	Core Practical - VI	Lab Course - VI	Learn the techniques of immunology. Learn the principles of immunological reactions. Carry out diagnostic tests using immunology kits.
IV	Core - X	Human Physiology and Endocrinology	To understand the fundamental mechanisms of body fluids and blood cells. Illustrate the circulatory system includes heart structure, cardiac cycles and cardiac factors and respiratory system includes anatomy, physiology, gas exchange and explain the role of lungs in acid base balance. Learn about the anatomy of digestive system and secretions, composition and functions of gastric and biliary system thereby learn how to digest the biomolecules in intestine. Understand the classification, biosynthesis and mechanism of anterior and posterior pituitary hormones in biological regulation and know about its deficiency diseases. Know in detail about synthesis, secretion, regulation, transport, metabolic fate and biological actions of thyroid hormone and learn about thyroid function test. To learn clearly about adrenal hormone synthesis, regulation, transport, metabolism and biological effects. Recognize a role of gonadal hormones and know about biological effects of estrogens and progesterone. Know what kind of biochemical changes occur during pregnancy. Understand the signal transduction pathway through cytoplasmic and nuclear level and its role in cellular function.
I	Elective Course -I	Biochemical Techniques	To have a strong and sound knowledge of the fundamental principles of Instrumentation. To have the practical skills and techniques in biochemical analysis. To have the practical knowledge of all the instrumental applications.
II	Elective Course – II	Plant Biochemistry and Biotechnology	Understand the basic knowledge of mechanism of water transport and Photosynthesis Describe the nitrogen fixation mechanisms in plants and interrelationship between photosynthesis and nitrogen metabolism Get the Knowledge about the Biosynthesis, transport, distribution, mechanism of action and physiological effects of plant hormones Understand the role of secondary metabolites in drug development Know about the isolation, fusion and culture of protoplast and also understand genetic manipulation of plants. Understand the gene transfer methods for plants and also know marker free gene methodologies and gene targeting. Know the transgenic plants and its applications & risks. Also understand the genetic modification in food industry and its applications, controversies over risks. Know the plant molecular biology techniques and its applications.
III	Elective Course – III	Microbial Biochemistry	Understand the classification and controlling of microbes and study isolation of microbes and maintenance. Describe the important characteristic of microorganisms, thereby identify different type of microorganisms. Study about various types of microorganisms involved in infection of food products. Recognize the sources and transmission of infections and how the factors involving in infection. Know about the different types of microscopes and its functions.
IV	Elective Course – IV	Bioinformatics and Nanotechnology	Understand the basic concepts of bio-informatics databases and tools on internet. Learn how to apply computational facility in different fields of life sciences, physical and chemical sciences. Have a clear detail about different protein structure and its predicting method. To learn how can utilize the BLAST and FASTA analysis for biological sequence. Recognize how can visual the structures and classification of proteins by visualization tools and learn to utilize this tools for alignment and analysis. Understand the drug designing through computer based modification programs using synthetic or natural source.
II	EDC	Biochemistry in Human Health	To learn about the structure, properties and functions of polysaccharides Illustrate on structure, properties and functions of lipids. Determine the classification, properties and significance of proteins Understand the importance of vitamins and minerals.
II	EDC	Human Physiology and Nutrition	Learn about the anatomy of digestive system and secretions, and functions of excretory system Learn about respiratory system and Circulatory system Understand Structure and functions of nervous system and muscular system know the basics of nutritional Biochemistry Understand the importance of vitamins and minerals.
II	EDC	Hospital management and Medical Coding	Understand the importance of Hospital management know the functioning of Hospital management system Understand the history of medical transcription Understand the impact of medical transcription know the implementation of medical transcription

# DEPARTMENT OF BIOTECHNOLOGY

**Name of the Programme: Bachelor of Science (Biotechnology) B.Sc (BT)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

## Programme Specific Outcome(PSO):

PSO1	Bestow the students with all the research skills required to work independently
PSO2	Develop scientific temperament and social responsibilities in the students.
PSO3	Inculcate nature care by imparting knowledge of advance modern techniques.
PSO4	Acquire technological knowhow by connecting disciplinary and interdisciplinary aspects of biotechnology.
PSO5	Acquire knowledge in students of biotechnology enabling their applications in industry and research.

**Name of the Programme: Bachelor of Science (Biotechnology) B.Sc (BT)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

## Programme Outcome(PO):

PO1	Students compete global competencies in the area of basic and applied biological sciences
PO2	Knowledge on biotechnology will guarantee promising career opportunities in academic, research and industrial sets.
PO3	To enrich students' knowledge and train them in various branches of Biotechnology such as genetics, molecular biology, biochemistry, immunology, plant/animal/microbial
PO4	Enhancing the subject knowledge of students by using traditional and modern ICT based teaching methods and learning by doing.
PO5	To groom the students to meet futuristic challenges and national interests.

## COURSE OUTCOME

**Name of the Programme: Bachelor of Science (Biotechnology) B.Sc (BT)**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
I	Core Theory - I	Cell Biology	To explain the prokaryotic and eukaryotic cell. To discuss the cell membrane and function in detail. To assess the structural and functional organization of cell organelles. To gain knowledge for cell to cell signaling. To examine the cellular basis of differentiation.
	Core Practicals - I	Lab In Cell Biology	To introduce an fundamentals of cell biology techniques To teach students the basic techniques and instrument principles in biotechnology To give hands on cell biology experiments
II	Core Theory - II	Genetics	Obtain acquaintance on historical overview of microbial genetics and genetic Materials Comprehend the concept of replication of genetic materials Understand about regulation of gene expression and mutation Demonstrate the genetic exchange mechanism in microorganisms Gain knowledge on Mutation Grasp the Basic of genetics and their role
	Core Practicals - II	Lab in Genetics	Successfully quantify the important biological constituents of cell. Analyze the sex chromatin present in different cells. Examine and evaluate the stages of Mitosis Could able to separate and interpret the mixture of components
III	Core Theory - III	General Microbiology	Remember and recall the historical events which paved the development of different types of microscopes. Understand and differentiate the different types of microbes. Analyze the media composition and grow the desired microbe. Apply the knowledge to enumerate the microorganisms from natural environment. Evaluate the success of understanding the viruses
	Core Practicals - III	Lab in Microbiology	Be aware of the laboratory rules and regulations Understand the importance, evolution and diversity of cells and preparation of Buffers Learns to visualize the cells by employing different types of microscopes Bring in the concepts of microbial culturing techniques Analysis of phenotypic characterization of known and unknown microbes and
IV	Core Theory - IV	Molecular Biology	Learning structural levels of nucleic acids- DNA and RNA and genome organization in prokaryotes and eukaryotes Understanding the concept of Gene and the gene architecture. Overview of the central dogma of life and various molecular events Learning molecular events in the DNA replication and role of different enzymes Molecular Events Translation leading to protein synthesis and Post translational modification. Understanding the regulation of gene expression in prokaryotes using operon concept and Eukaryotes.
	Core Practicals - IV	Lab in Molecular Biology	To acquire knowledge about basic molecular biology tools To develop the skills in isolating and identifying the challenges in molecular biology related tools To develop the skill for implementing new project plants
I	Allied Theory - I	Biochemistry - I	Describe structures, properties and functions of carbohydrates Understand the structures, properties and role of amino acids and proteins Describe the nomenclature and identify the classes of enzymes and factors affecting their action with kinetics. Demonstrate about the structure and properties of lipids and Nucleic acids with their importance. Describe about source, importance and deficiency disorders of vitamins and minerals
II	Allied Theory - II	Biochemistry - II	Understand the basics of acid - base balance of human body and gain Develop competence in handling various chromatographic techniques. Describe carbohydrate metabolism and gain knowledge about Diabetes mellitus Learn basic concepts of Bioenergetics, mechanisms of oxidative phosphorylation. Describe the concepts of lipid metabolism and amino acid metabolism. Gain knowledge about the basic terminologies, classification and mechanism of action of hormones and to demonstrate various types of second messengers.
			Analyse biomolecules for qualitative study

	Allied Practical - I	Lab in Biochemistry	Learn about biochemical preparation carbohydrates, proteins and lipids Quantify the biomolecules Experiment chromatography techniques
III	Allied Theory - III	Biostatistics	Understand and apply the statistical methods like measures of location, dispersion and the relationship between two variables in bio-statistics. Understand large and small samples in laboratory study to apply it in real life problems.
IV	Allied Theory - IV	Computer application in office	Remember the basics of MS word. Understand MS word. Demonstrate the functions of MS excel. Study the basics of MS excel workbooks. Analyze of data processing with MS power point.
	Allied Practicals - IV	Lab in Computer application in office	To enable the students to design and develop the Office applications. To qualify the students working in editor, spread sheet and slide preparation. To improve creative thinking in presentation software.
II	SBEC I	Bioinstrumentation	Demonstrate the basics of instrumentation by analysis Exemplify the structure of atoms and molecules by using the principles of Spectroscopy Evaluate by Separating and Purifying the components Understand the need and applications of imaging techniques Categorize the working principle and applications of fluorescence and radiation based techniques
III	SBEC II	Developmental Biology	Use main developmental biology concepts Explain the molecular mechanisms that underlie animal and plant development Explain underlying developmental biology processes of sperm and egg. Review scientific literature in the subject developmental biology critically Plan and carry out laboratory sessions as well as interpret results to examine the importance of specific genes in developmental biology processes. Understands the students about sequential changes from single cell organization to organ level in the development of multicellular organisms.
	NMEC I	Human Health and Hygeine	Understand the classification of nutrients Gain knowledge on the intake of balanced diet and the significance of food List the common deficiency disorders, their causes, symptoms and recommended food sources Evaluate the importance of a balanced diet Understand the types of abuses and associated behavioural changes. Know the causes for drug, tobacco and alcohol addiction and its effects on health Analyse the possible ways of de-addiction Know about the diseases and disorders associated with lifestyle modification Explain the underlying cause and symptoms for diabetes, obesity, cancer and AIDS.
IV	NMEC II	Wild life management	Know the basic concept and principles of Wildlife Management Understand the Evaluation of Wild life habitat Know population estimation Analyse Human – animal conflict Realise Zoo's Zoological Parks, Wildlife sanctuaries, National Parks and Tiger reserves

**Name of the Programme: Bachelor of Science (Biotechnology) B.Sc (BT)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2017-2018 onwards**

**Programme Specific Outcome(PSO):**

PSO1	Acquire knowledge in students of biotechnology enabling their applications in industry and research.
PSO2	As Biotechnology is an interdisciplinary course, empower the students to acquire technological knowhow by connecting disciplinary and interdisciplinary aspects of
PSO3	Knowledge on biotechnology will guarantee promising career opportunities in academic, research and industrial sets.

**Programme Outcome(PO):**

PO1	Gain knowledge on plant tissue culture, animal tissue culture and its requirements
PO2	Gain knowledge on immunity, antigen, antibody and cells of immune system
PO3	Enhance and understand concept of vectors and vector-based systems.
PO4	Obtain knowledge on instruments used for different quantification analysis

**COURSE OUTCOME**

**Name of the Programme: Bachelor of Science (Biotechnology) B.Sc (BT)**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
V	Core Theory - V	Plant Biotechnology	Understand scientific and technical skills on plants study Acquire knowledge on limitations and challenges in plant cell tissue culture. Know the applications of Plant Biotechnology Learn the preservative methods of cells Evaluate and discuss public and ethical concerns over the use of plant Biotechnology
	Core Theory - VI	Immunology and Immunotechnology	Design a model of Immunoglobulin/Antibodies Describe which cell Mtypes and organs present in the immune response Illustrate various mechanisms that regulate immune responses and maintain Tolerance Exemplify the adverse effect of immune system including Allergy, hypersensitivity and autoimmunity Apply basic techniques for identifying antigen antibody interactions Explain the stages of transplantation responses
	Core Theory - VII	Genetic Engineering	Acquaint with the vocabulary involved in molecular cloning strategies and techniques used to probe DNA for specific genes of interest Apprehend with the tools and techniques in rDNA technology and types of Vectors Relate the role of restriction and modifying enzymes in recombinant DNA Technology Explore the techniques involved in construction of genomic DNA library and cDNA library Design the protocols for analyzing gene transfer methods and to explore knowledge on hybridization based markers
	Core Practical - V	Lab in Plant Biotechnology	Understanding the concepts and principles of Plant tissue culture. Learning the techniques of sterilization and monitoring method of sterilization. Learning different pathways of plant regeneration under in vitro conditions - organogenesis and somatic embryogenesis.

			Techniques of establishing cell suspension culture.
			Understand the practical skills in Immunology
			Acquire skills in genetic engineering
			Examining and analyzing the results involved in immune techniques and genetic engineering
			Developing and applying the recent technology involved in diagnostic techniques of immunology and genetic engineering
	Core Practical - VI	Lab in Genetic Engineering and Immunology	
VI	Core Theory - VIII	Animal Biotechnology	To develop an understanding on basic pattern of animal cell culture and controlling characters
			Acquire knowledge on handling animal cell culture and their applications
			Understand the gene transfer technology , transgenic animal and stem cell technology
			Emphasize techniques on fertilization in animals and its development
			Highlight the applications of animal biotechnology in various fields
	Core Theory - IX	Proteomics and Genomics	develop the molecular skills.
			knowledge about the handling of instruments for different applications.
			Knowledge about Sequencing
			Knowledge about spectroscopy and applications of proteomics
	Core Theory - X	Bioprocess & Enzymology Technology	Narrate the scope and economics of Microbial Biotechnology
		Understand the need of microbial products for the mankind	
		Examine the learned techniques in production of industrially important products	
		Think about the innovativeness in the production of new beneficial metabolites	
Core Practical - VII	Lab in Animal Biotechnology	understand the practical skills in animal biotechnology	
		acquires skills in animal tissue culture	
		examining and analyzing the results involved in animal tissue culture technique	
Core Practical - VIII	Lab in Bioprocess Technology and Enzymology	Acquire an overview about the fundamentals of Bioprocess Technology	
			Knowledge on enzymology tools and their application in industry, agriculture and milk production
V	SBEC - III	Nanobiotechnology and Bioinformatics	The student will develop a fundamental knowledge of nanomaterials.
			The student will demonstrate a basic understanding of the length scale that defines nano for metal and semiconductor materials
			The student will demonstrate an understanding of the challenges on safe nanotechnology
			A student will develop a fundamental knowledge of DNA databank , protein data bank and sequence alignment tool
VI	SBEC - VI	Pharmaceutical Biotechnology	Compare and contrast the specific pharmacology of the major classes of drugs, important distinctions among members of each class
			Understand the medicinal and pharmaceutical importance of drug compounds
			Analyze the fundamental principles of pharmacokinetics and pharmacodynamics.

<b>Name of the Programme: Master of Science M.Sc (BT)</b>			
<b>For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards</b>			
<b>Programme Specific Outcome(PSO):</b>			
<b>Upon completion of the degree requirements, students will be able to</b>			
PSO1	To bestow the students with all the research skills required to work independently		
PSO2	To develop scientific temperament and social responsibilities in the students		
PSO3	To inculcate nature care by imparting knowledge of advance modern techniques.		
PSO4	As Biotechnology is an interdisciplinary course, empower the students to acquire technological knowhow by connecting disciplinary and interdisciplinary aspects of biotechnology		
PSO5	Acquire knowledge in students of biotechnology enabling their applications in industry and research		
<b>Programme Outcome(PO):</b>			
<b>Upon completion of the degree requirements, students will be able to</b>			
PO1	Students develop global competencies in the area of basic and applied biological sciences.		
PO2	Knowledge on biotechnology will guarantee promising career opportunities in academic, research and industrial sets.		
PO3	To enrich students' knowledge and train them in various branches of Biotechnology such as genetics, molecular biology, biochemistry, immunology, plant/animal/microbial biotechnology, environmental biotechnology, clinical biotechnology and tissue culture techniques		
PO4	Enhancing the subject knowledge of students by using traditional and modern ICT based teaching methods and learning by doing. PO5		
PO5	To groom the students to meet futuristic challenges and national interests.		
<b>COURSE OUTCOME</b>			
<b>Name of the Programme: Master of Science Biotechnology M.Sc (BT)</b>			
<b>For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards</b>			
Core - I	Cell Biology	Understanding the prokaryotic and Eukaryotic cell.	
		Discussing in detail the cell membrane and function	
		Understanding the structural and functional organization of cell organelles	
		Gaining knowledge for cell to cell signaling.	
		Examining the cellular basis of differentiation	
Core - II	Biological Chemistry	To make students have a strong foundation in chemical biology.	
		To introduce them to metabolic pathways of the major biomolecules and relevance to clinical conditions	
		To correlate Biochemical process with biotechnology applications	
		To discuss the significance of various metabolic processes occurring in biological system	
		To evaluate of both Hormones and Enzymology and also its medical importance in the human life.	

Core - III	Microbiology	To understand the landmarks of microbiology, sterilization and principle and working of microscopes
		To get in depth knowledge of microbial diversity and growth curve of microbes.
		To know microbial diseases and host pathogens interaction by microbes.
		To examine on epidemic and pandemic diseases
		To learn agricultural and environmental microbiology

I	Core - IV	Practical I -Lab in Cell Biology and Biological Chemistry	<p>Find out the various stages of Cell division.</p> <p>Sex chromatin determination by performing a Barr body experiment</p> <p>Differentiate the bacterial cells</p> <p>Obtain knowledge for the preparation of stains, buffers, standard solutions for various biochemical assays</p> <p>To train the students for estimation of nucleic acid, protein and starch.</p> <p>Use chromatography techniques, students will be able to separate pigments and amino acids from a mixture of samples</p>
	Core - V	Practical II -Lab in Microbiology	<p>To understand the practical skills in microscopy and their handling techniques and staining procedures</p> <p>To understanding various Culture media and their applications and also understand various physical and chemical means of sterilization</p> <p>To realize General bacteriology and microbial techniques for isolation of pure cultures of bacteria and fungi</p> <p>To master aseptic techniques and be able to perform routine culture handling tasks safely and effectively</p> <p>Comprehend the various methods for identification of unknown microorganisms</p> <p>To know the various Physical and Chemical growth requirements of bacteria and get equipped with various methods of bacterial growth measurement.</p>
II	Core - VI	Genetics & Molecular Biology	<p>Learn the basic concept of genetics with Mendelian and non Mendelian inheritance with suitable model organisms</p> <p>Understand the structural organization of chromosome, gene and genome</p> <p>Apply the principles and mechanisms of microbial and population genetics</p> <p>Analyze the structure and functions of informational molecules like DNA, RNA, and proteins</p> <p>Evaluate the mechanism of genome mapping with molecular markers and oncogenes</p>
	Core - VII	Immunology and Immunotechnology	<p>To present an overview on types of immunity &amp; immunological responses and to illustrate about different cells and organs involved in immune system, properties and role of antigens and antibodies in immune system</p> <p>To demonstrate the principle of antigen and antibody interactions and its diagnostic applications</p> <p>To display the role of MHC in antigen processing and presentation and the elaborate the process of T cell and B cell activation during the course of Cell mediated and Humoral immune responses respectively</p> <p>To elucidate on the properties and functions of cytokines and complement components in immune response, hypersensitivity reactions and different types of vaccines</p> <p>To interpret the mechanism of immune response against the Infectious diseases, Immunodeficiency and Autoimmune diseases, Transplantations and Cancers.</p>
	Core - VIII	Genetic Engineering	<p>To learn the theoretical knowledge in the genetic engineering enzymes and application.</p> <p>Understanding the basic concept of gene cloning and the role of enzymes and vectors responsible for gene manipulation, transformation and genetic engineering.</p> <p>Students expanded their knowledge about gene transfer methods and identifying suitable hosts for cloning and sequencing</p> <p>To learn the genomic library construction, hybridization and labeling techniques.</p> <p>Describe the Transgenic methods, chromosome jumping and PCR and methods for gene therapy</p>
	Core - IX	Practical III- Lab in Immunology and Immunotechnology	<p>Identify various immune cells and enumerate them</p> <p>Competently perform serological diagnostic tests such as ASO, CRP.</p> <p>Identify blood groups and types.</p> <p>Students will learn the ELISA and western Blotting Techniques.</p>
	Core - X	Practical IV- Lab in Genetic Engineering and Molecular Biology	<p>Outline the fundamental steps in a genetic engineering procedure</p> <p>Describe the mechanism of action and the use of restriction enzymes in biotechnology</p> <p>Explain the steps of a bacterial transformation and various selection processes for identifying transformants.</p> <p>Students will become familiar with the tools and techniques of genetic engineering DNA manipulation enzymes, genome and transcriptome analysis and manipulation tools.</p> <p>Students will be able to perform basic genetic engineering experiments at the end of course.</p>
III	Core - XI	Plant Biotechnology	<p>Acquire the knowledge about the techniques of Plant Tissue Culture, Lab. organization &amp; measures adopted for aseptic manipulation and nutritional requirements of cultured tissues.</p> <p>Learn the techniques of culturing tissues, single cells, protoplasts &amp; anther culture, germplasm conservation and cryobiology</p> <p>Learn the large scale clonal propagation of plants through various micropropagation techniques, Production of secondary metabolites under in vitro conditions</p> <p>A good understanding of r-DNA technology, methods of gene transfer, molecular markers and marker assisted selection</p> <p>Develop transgenics resistant to biotic &amp; abiotic stresses &amp; quality characteristics and their role in crop improvement</p>
	Core - XII	Animal Biotechnology	<p>To know and be familiar with the organization of animal cells, scope &amp; limitations of animal cell culture, types and characteristics of cell culture</p> <p>To gain knowledge on the infrastructure requirements for animal cell culture like laboratory layout &amp; design, equipments, substrates and media requirements for animal cell culture, properties of animal cell culture medium and maintenance of aseptic condition</p> <p>To become aware of the basic techniques involved in animal cell culture for establishment of cell line, cloning &amp; selection, cell line characterization, quantification and scale up techniques</p> <p>To understand about the applications of animal cell culture in drug testing like viability and cytotoxicity assay, cryopreservation of cell lines and establishment of cell banks, bio-safety regulations and Bioethics in animal cell culture and specialized techniques preferred in animal cell culture</p> <p>To interpret about culture of specific cell types like hematopoietic cells and tumor cells, tissue engineering and stem cell technology and its applications, role of animal cell culture in IVF &amp; test tube babies and gene therapy using embryonic stem cells.</p>
	Core - XIII	Bioprocess Technology	<p>Designing of bioreactors and control necessary for maximizing production.</p> <p>Select and optimize media for maximum production of microbial metabolites.</p> <p>Designing of protocols for strain improvement and separation of molecules after separation process</p> <p>Describe and analyze the control of invitro cellular growth process within the industrial –scale bioreactor environment</p> <p>To understand the various techniques for isolation, recovery and purification of a protein and evaluate the outcome</p>

	Core - XIV	Research methodology & Bioinstrumentation	<p>learn about Introduction, types and methods of research</p> <p>acquiring the skills of scientific reading, writing and presentations of research</p> <p>apply the working principles and methodology of various types of measurement techniques like spectroscopy, centrifuge, chromatography and flourimetry</p> <p>Analyze the mechanism of separation and imaging techniques</p> <p>learn the statistical analysis of biological data</p>
	Core - XV	Practical V- Lab in Plant & Animal Biotechnology	<p>On completion of course, students should be able to gain basic skills in plant biotechnology</p> <p>Gain the knowledge on animal cell cultures</p> <p>Learn about the culture media used in animal cell culture.</p> <p>Gain the knowledge on Preparation of media for animal cell culture. Primary culture of chick embryo fibroblasts. Primary culture of chick organ - spleen and kidney cells.</p>
	Core - XVI	Practical VI- Lab in Bioprocess Technology	<p>To isolate the industrially important microorganisms from soil</p> <p>Carry out the basic technique for the isolation of antibiotic and carotenoid producing bacteria.</p> <p>Assay technique for protease, amylase and antibiotic</p> <p>Immobilization technique and production techniques for citric acid and alcohol .</p> <p>Learn the purification of enzymes</p>
IV	Core - XVII	PROJECT	<p>Work in a team</p> <p>Adapt to the varying working environment in industry and research institute</p> <p>Identify a problem in biotechnology based industry</p> <p>Formulate a research problem in research laboratory</p> <p>Design experiments to solve the industrial/research problem.</p> <p>Compile and/or interpret the industrial data.</p>
I	Elective Course – I	Food Science and Technology	<p>Describe the significance and importance of microbes in food.</p> <p>Details of food processing and preservation techniques</p> <p>Explain about principles of toxicology and its process</p> <p>Elaborate study on epidemic and pandemic diseases</p> <p>Describe agricultural and environmental microbiology.</p>
II	Elective Course – II	Genomics, Proteomics and Bioinformatics	<p>To familiarize the students with genome databases and metagenome database and analysis, markers for genetic analysis and gene expression profiling</p> <p>To gain insight into different sequencing methods, comparative and functional genomic analysis which enables the students to understand about sequence and structure based approaches for gene prediction and function determination.</p> <p>To have better understanding about proteomics and learn about protein profiling and analysis of data generated through mass spectrometry and to be aware of the bioinformatics tools available for analysis of proteomic data.</p> <p>To have an enhanced theoretical knowledge on biological databases and sequence analysis</p> <p>To understand well about sequence alignment tools, gene prediction methods and homology modelling &amp; drug targeting</p>
III	Elective Course – III	Bio-Entrepreneurship	<p>To have a fundamental idea about the principles of management, learn to make a business proposal, arrange for financial resources and maintenance of business establishment by accounting practices and other essential concepts required for executing a business plan</p> <p>To establish basic knowledge on the role of human resource development and learn about recruitment process, developing managerial and marketing skill, team work and achieve customer satisfaction</p> <p>To understand the features of entrepreneurs and enabling the students to develop their capacity as an entrepreneur thereby emphasising their role in building the economy of the nation</p> <p>To gain insight into the characteristics and objectives of small scale industry (SSI), thereby making the students to be aware of the government support to small scale industry</p> <p>To be familiar with the different schemes offered by Government institutions to support entrepreneurs and also provides the basic knowledge on project proposal preparation, feasibility analysis, execution and management</p>
II	EDC	Human Rights	<p>To impart the basic ideas about Human Rights at post graduations level.</p> <p>It provides different aspects of human rights which includes children and women.</p> <p>Students can learn not only their basic rights bus also can understand the duties to be carried out in the days to come.</p>

# DEPARTMENT OF MICROBIOLOGY

**Name of the Programme: Bachelor of Science B.Sc (Microbiology)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Specific Outcome(PSO):**

<b>PSO1</b>	To contribute to the development of society and produce microbiological products, by collaborating with stake holders, related to the betterment of environment and mankind at the national and global level
<b>PSO2</b>	To create effective entrepreneur by enhancing their critical thinking, problem solving, decision making and leadership skill that will facilitate startups and high potential organizations
<b>PSO3</b>	Design and implement HR systems that comply with good laboratory practices, following ethical values, leading the organization towards growth and development

**Name of the Programme: Bachelor of Science B.Sc (Microbiology)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Outcome(PO):**

<b>PO1</b>	Acquire detailed knowledge and expertise in all the disciplines of the subject
<b>PO2</b>	Able to communicate scientific information concepts, experiments and significance
<b>PO3</b>	Apply knowledge on ethical and legal based issues
<b>PO4</b>	Familiarize to collect, analyse and interpret scientific data

**COURSE OUTCOME**

**Name of the Programme: Bachelor of Science B.Sc (Microbiology)**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
<b>I</b>	Core - I	Basics of Microbiology	Students will get overall understanding about the fundamentals of microbiology. To understand the concepts of microscopy. v Gain knowledge about the microbial evolution and diversity. Acquire information on anatomy of prokaryotes.
	Core practical - I	Basics of Microbiology	Practice sterilization methods; learn to prepare media and their quality control. Learn streak plate, pour plate and serial dilution and pigment production of microbes. Understand Microscopy methods, different Staining techniques and motility test. Observe culture characteristics of microorganisms.
<b>II</b>	Core - II	Microbial physiology	The students will get an overall understanding of basic cell structure and classification of microorganisms based on its nutritional requirements. Gain knowledge on the growth pattern of microorganisms and the influence of nutrients to obtain active growth phase. Information on energy deriving mechanism from different energy sources.
	Core practical - II	Microbial physiology	Acquire information on synthesis of organic molecules via photosynthetic process Describe hanging drop, wet mount preparation, semi-solid agar, Craigie's tube method. Demonstrate Smear preparation, permanent specimen preparation, Capsular, and Acid-fast staining. Explain antibiotic sensitivity testing: Disc diffusion test- quality control with standard strains. Describe demonstration of the size of yeast, fungal filaments and protozoa. Elaborate on the bacterial identification- morphological, physiological, and biochemical methods.
<b>III</b>	Core - III	Microbial Genetics and Molecular Biology	Understand the knowledge about the genetic material and DNA replication. Created an understanding about mutation and its types. Procured the knowledge about Transcription and Translation. Learned about gene transfer mechanisms in bacteria
	Core practical - III	Microbial Genetics and Molecular Biology	Illustrate different types of DNA and RNA. Utilize hands-on training in isolation of genomic and plasmid DNA. Analyze importance of experimental microbial genetics Apply the knowledge of molecular techniques in various fields. Investigate the significance of Phages.
<b>IV</b>	Core - IV	Immunology and Immuno technology	The students will get overall understanding of history and evolution of immunology and immune response developed by human system To understand the concepts of antigen, antibody interactions and influence on human immune system via hypersensitivity reactions, autoimmune diseases etc. Detailed understanding of Immunohaematology, Transplantation Immunology and Vaccines which will make the minds aware of infection, prevention and control.
	Core practical - IV	Immunology and Immuno technology	Help the students to learn techniques involved in immunological concepts and its role in diagnostic immunology Assess the blood groups and types Competently perform serological diagnostic tests such as RF, ASO, CRP Illustrate the antigen antibody reactions in gel. Compare & contrast antigens and antibodies in electrophoresis Examine the concept of ELISA.
<b>III</b>	SBEC-I	Applied Biotechniques	To acquire the basic science behind the research techniques. Students will become familiar with biotechniques like chromatography, electrophoresis and spectrophotometry for quantitative and qualitative analysis Students will be inculcated with precise and accurate interpretation skills in the research sector. To imbibe the knowledge on modernised analytical methods to step in hi-tech industries.
<b>III</b>	NMEC-I	Biofertilizer technology	Able to get basic idea about biofertilizer production For to learn application techniques about biofertilizer Capable to make mass multiplication Able to make the students ideally skilled for self-employment
	NMEC-II	Mushroom technology	Able to get basic idea about mushroom cultivation For to learn techniques about spawn multiplication Capable to identify the diseases of edible mushrooms Able to make the students ideally skilled for self employment
	NMEC-III	Clinical Lab Technology	Learn the handling of instruments and various measurements used in the laboratory. Gained knowledge about laboratory techniques its significance in diagnostic evaluation. Identify and differentiate the different types of bacteria and fungi in clinical samples. Learn the differential diagnosis by the help of different serological techniques.
	NMEC-IV	Quality control in industries	To acquire the knowledge quality control in pharmaceutical industry To learn the quality control audits in industries. To understand the basics of food safety and food quality. Skilled on manufacturing operation in industries

**Name of the Programme: Bachelor of Science B.Sc (Microbiology)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2019 onwards**

**Programme Specific Outcome(PSO):**

<b>PSO1</b>	The microbiological equipment especially Microscope, Incubator, Laminar Air Flow chamber, Centrifuge etc.,
<b>PSO2</b>	The microorganism especially Bacteria, Fungi, Algae, Protozoa, Virus.
<b>PSO3</b>	The various fields in microbiology particularly Agricultural, Medical, Environmental, Industrial areas.

**Programme Outcome(PO):**

<b>PO1</b>	Solve public issues concerned with public health and safety for the welfare of the society
<b>PO2</b>	Proficient skills and competence to make a prospective career in Research & Development
<b>PO3</b>	Equip with skills based on current trends and future expectations for career development and placements
<b>PO4</b>	Handle laboratory experiments following safety precautions and standards

COURSE OUTCOME			
Name of the Programme: Bachelor of Science B.Sc (Microbiology)			
SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
V	Core - V	Medical Bacteriology	Understood the basic and general concepts of infections and the various parameters of causing infections. Assessment of their severity including the broad categorization of the methods of diagnosis. Developed a thorough understanding of common Gram positive bacterial diseases of human being. Conceptualized the role of some bacteria as well as the mechanisms underlying the pathogenicity of them. Developed a thorough understanding of some special pathogenic bacteria affecting the human organ systems
	Core - VI	Food and Dairy Microbiology	Know the positive and negative role of microbes in food. Gain knowledge about fermented food products. v Understand the significance of food borne diseases. Realize the importance of food sanitation and quality assurance.
	Core practical - V	Medical Microbiology	To familiarize students with medical microbiology techniques and technical knowledge on collection and processing of clinical samples. To learn the techniques for isolation and identification of bacterial pathogens. To gain expertise in various techniques of clinically important viral pathogens and their identification. To get acquainted with medically important fungi and their metabolism To categorize parasites and understand their role in infections.
VI	Core-VII	Soil and Agricultural Microbiology	Able to understand the distribution of microbes in soil Capable to get information about biogeochemical cycle Able to get the knowledge about microbial interaction Capable to get idea about plant disease
	Core - VIII	Environmental and pharmaceutical Microbiology	Able to understand about the microbial diversity in environmental Capable to get information about the ecosystem Able to get overall understand the pollution Capable to understand basic knowledge about bioremediation
	Core - IX	Medical virology	Recognize how the two different classes, DNA and RNA viruses causing viral diseases in human beings. Conceptualized the role of viruses as well as the mechanisms underlying the pathogenicity of them, their detection and prophylaxis. Developed a thorough understanding of some special pathogenic viruses causing recent epidemics and threatening the whole world.
	Core practical - VI	Applied Microbiology	Describe about plant diseases caused by microbes and acquire a clear idea on plant pathogenic interaction Describe about the structure and function of ecosystems and understand the role of microbes in various environments Identify the cause of water pollution, and perform methods to assess the quality of water.
V	Elective-I	Medical Parasitology and Entamology	Understanding of taxonomy of parasite and host – parasite interaction. v In depth knowledge on clinical diagnosis, pathogenicity and life cycle of protozoans Assimilate various lab technologies for diagnosis of medically important protozoans and their treatment. Articulate the major means of transmission of parasites by insect vectors and their control measures.
	Elective-II	Medical Mycology	Basic understanding of fungi, their morphology and culture methods of fungi. Obtain knowledge on pathogenicity and laboratory diagnosis of medically important fungi. Grasp knowledge on mycotoxins and their importance. Gain knowledge on antifungal agents and their testing methods.
	SBEC - III	Recombinant DNA Technology	Understand the knowledge about The Basic Principles of Gene Cloning. Acquire knowledge about Molecular Cloning Tools Created an understanding about Cloning Vectors Gene transfer Techniques Procure the knowledge about Methods in Molecular Cloning
VI	Elective - III	Industrial Microbiology	Able to select and design a fermentation process for a specific product Capable of identifying industrially important microbes and its potential applications Able to device means to improve the production rate of existing fermentation processes Capable of designing processes for higher production yield at economically cheaper rate
	SBEC-IV	Clinical Lab Technology	Demonstrate ethical and professional conduct with patients, laboratory personnel, healthcare professionals, and the public. Explain how accurate and reliable information might be obtained about proper procurement, storage, and handling of laboratory specimens. Develop a sound scientific knowledge foundation that prepares them to interpret, analyze and evaluate scientific knowledge in clinical practice. Perform a full range of laboratory tests with accuracy and precision. Establish quality assurance principles and practices to ensure the accuracy and reliability of laboratory information.

**Name of the Programme: Master of Science M.Sc (Microbiology)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Specific Outcome(PSO):**

PSO1	Improve innovative thinking, ideas, behaviours, belief and apply diverse frames to decision and action
PSO2	Enhance to create effective entrepreneurs by enhancing critical thinking, problem solving and leadership quality
PSO3	Design and implement HR based research system in research to comply with employment laws.
PSO4	Produce employable, ethical and innovative professionals for dynamic business world
PSO5	Contribute to the development of the society by collaborating with stakeholders for mutual benefit

**Name of the Programme: Master of Science M.Sc (Microbiology)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Outcome(PO):**

PO1	Apply knowledge to solve problems through research in Global context
PO2	Analytical and critical thinking ability for decision making
PO3	Incorporate quality, ethical and legal value based perspectives to organizational activity
PO4	Develop communication, managerial and interpersonal skills
PO5	Lead themselves as a team to achieve organizational goals
PO6	Enhance employment skills in the competitive environment
PO7	Equip with skill and competence to become an entrepreneur
PO8	Succeed in career endeavors and contribute to society
PO9	Knowledge of values and beliefs of multiple culture and global perspective
PO10	Ability to embrace moral/ ethical values in ones life

**COURSE OUTCOME**

**Name of the Programme: Master of Science M.Sc (Microbiology)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
I	Core - I	General Microbiology	Gain a strong foundation on general microbiological practices Learn the basics of various characteristics features of divisions used in the classification of bacteria, fungi, protozoa and algae. Know the basics of Microbial taxonomy and Metabolism of microbes
	Core practical - I	General Microbiology and Immunology	Perform the various staining techniques of bacteria and study the growth rate of bacteria Understand the various methods to isolate and identify the Microorganisms.
	Core - II	Immunology and Immunotechnology	Gain a strong foundation on general immunological practices Understanding the Immunological assays and test. Understanding the various drugs and vaccines in emerging diseases
	Core practical - II	Cell and Molecular Biology	Perform the various staining techniques of bacteria and study the Isolation of DNA and RNA process of bacteria Understand the various methods to isolate and identify the microorganisms and bacterial genetic analytical process
	Core - III	Cell and Molecular Biology	Gain a strong foundation on general Cell Structures and Molecular practices. Understanding the molecular structure of genes Basic process and encoding genetic level important mechanism
II	Core - IV	Medical Bacteriology and Mycology	Gain wide information regarding various types of bacterial and fungal infections enable p Apply their acquired knowledge on laboratory techniques on diagnosis of bacterial and fungal disease
	Core practical - III	Medical Bacteriology and Mycology	Perform the various staining techniques of bacteria and study the Isolation from various samples Understand the various methods to isolate and identify the Microorganisms from Bacterial Infection samples
	Core - V	Industrial and Pharmaceutical Microbiology	Gain wide information regarding various types of bacterial and fungal Biochemical process and Fermentations. Microbial production of various industrial important products by bacteria and fungi. Understanding Pharmaceutical microbiological process by checking sterility of the samples.
	Core - VI	Genetic Engineering and Advances in Biotechnology	Recall the basics and importance of enzymes in molecular research. Apply cloning for developing novel recombinant product Develop transformants for production of various pharmacologically important products Apply gene transfer technology for controlling plant diseases Demonstrate sequencing method for bacterial identification.
	Core practical - IV	Genetic Engineering and Industrial Microbiology	Industrial products and various important processes in industries. various microbial products important in commercial products. To understand the genetic analytical process.
III	Core - VII	Medical Virology and Parasitology	Isolation and identification of viruses and parasites in the clinical sample. Knowledge gained as collection from infected food samples
	Core practical - V	Medical Virology and Parasitology	Isolation and identification of viruses and parasites in the clinical sample. Knowledge gained as collection from infected food samples
	Core - VIII	Food, Dairy and Environmental Microbiology	Isolation and identification of diseases producing bacteria from food samples Micro organism present in the air sample and seawage samples. Various treatment processes in seawage for microbial load.
	Core Practical - VI	Food, Dairy and Environmental and Agricultural Microbiology	Isolation and identification of diseases producing bacteria from soil samples Micro organism present as Bio fertilizers Soil pathogens Degradation process in soil
	Core - IX	Soil, Agricultural Microbiology Biodegradation	Isolation and identification of diseases producing bacteria from soil samples Micro organism present as Bio fertilizers Soil pathogens Degradation process in soil
IV	Core - X	Research Methodology, Biostatistics and Bioinformatics	Data collection and computations in biology Presentation of research Bio informatics related with research.

I	Elective course - I	Inheritance Biology	Mendelian Principle
			Gene Mapping
			Mutation
III	Elective - II	Methods in Biology	Recombinant DNA methods
			Immuno Techniques
			Biophysical Method
IV	Elective - III	Plant Physiology and Plant tissue culture	Photosynthetic mechanism energy
			Energy generating pathways
			Micro propagation process
II	EDC	Entrepreneurial Microbiology	To make Knowledge about the role of microbes in Industries
			Gained knowledge about fermented products.
			To understand the significance of patenting
			Able to make the students ideally skilled for self-employment
	EDC	Microbial Nanotechnology	Identify various applications of nanomaterials in the field of medicine and environment
			Examine the prospects and significance of nanobiotechnology
			Design non toxic nanoparticles for targeted drug delivery
			Identify recent advances in this area and create a career or pursue research in the field
	EDC	Basics of Microbiology	Understanding history of microbiology and microbial techniques
			Apply laboratory safety procedures and hospital waste disposal strategies
	EDC	Human infectious diseases and diagnostics	Collect various clinical specimens, handle, preserve and process safely
			Identify the causative agents of diseases by conventional and molecular methods following standard protocols
Assess the anti microbial susceptibility pattern of pathogens			
Trace the sources of nosocomial infection and recommend control measures			

# DEPARTMENT OF HOTEL MANAGEMENT

**Name of the Programme: Bachelor of Science - B.Sc (Hotel Management & Catering Science)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2022-2023 onwards**

**Programme Specific Outcome(PSO):**

PSO1	Acquire technical skills in the core areas of the hotel and other hospitality sectors
PSO2	Ability to understand professional techniques and use tools competently in the preparation, presentation and service of quality foods
PSO3	Endorse sustainable environment and corporate social responsibility initiatives as well as ethical practices in the hospitality business
PSO4	Apply the knowledge of Hotel Management and Catering Science in the domain Hospitality Industry
PSO5	Unique Industrial Exposure Training cum Placement will engage the student in perennial process

**Name of the Programme: Bachelor of Science - B.Sc (Hotel Management & Catering Science)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2022-2023 onwards**

**Programme Outcome(PO):**

PO1	Graduates will acquire dynamic skills through proper perception of the course objectives that leads to scientific and analytical comprehension of the concepts
PO2	Graduates will focus on sustainable goals that might bring about spherical developments
PO3	Graduates will infuse a spirit converging on bricking a team work, interpersonal and administrative skills to think critically and execute effectively
PO4	Graduates will apply reasoning appropriately to scale the humps in learning and solute them to the core
PO5	Graduates will engage the skills obtained in independent and collaborative learning as a perennial process

**COURSE OUTCOME**

**Name of the Programme: Bachelor of Computer Science B.Sc (Hotel Management & Catering Science)**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
I	Core - I	Food Production & Patisserie-I	Students can remember aims & objectives of cooking food Ability to understand and use cooking materials and their techniques Apply the knowledge on preparing different types of Salad, Sauces, and Soups for continental cuisine Analyze the skills on knife and meat cuts
	Core - II	Accommodation Operation-I	Ability to identify and use different types of housekeeping equipment Ability to Understand bed making procedure Apply various polishing methods Analyze the maid's trolley settings procedure Evaluate Guest Room inspection
	Allied-I	Front Office operation-I	To identify types of hotels, rooms, room rates and guests Ability to understand the Organization Structure of Front office Department Ability to apply the Procedure for reservation of rooms through computer based Reservation system Ability to apply the knowledge on check-in and check-out procedure
	Practical - I	Accommodation Operation-I	Ability to identify and use different types of housekeeping equipment Ability to Understand bed making procedure Analyze the maid's trolley settings procedure Evaluate Guest Room inspection
	Practical - II	Front Office operation-I	Recall Important Tourist place in India Ability to understand telephone handling procedure Calculate and prepare various front office records and reports To handle emergencies situation Analyzing the arrival and departure lists
II	Core - III	Food & Beverage Service-I	Remember about the sectors and Functions of Food and Beverage industry Ability to understand Food and beverage service equipment Apply the knowledge on types of Services Ability to compile menu of different types of Breakfast.
	Allied-I	Food science & Nutrition	Ability to identify the food groups Ability to understand the functions of Carbohydrate Ability to understand the right kind of amounts of minerals and water intake for good health Ability to apply the food Adulteration
	Practical - III	Food Production & Patisserie-I	Ability to identify and use the kitchen equipmen Ability to Understand and apply methods used in preparation of stocks, sauces Display the knowledge of various knife cuts and be well versed in different in different method of cooking Analyze the skills on preparation of various dishes
	Practical - IV	Food & Beverage Service-I	Ability to identify different types of wines Ability to understand sparkling wine procedure Ability to apply the procedure involved in production of Beer Demonstrate steps involved in production of Spirits Analyze the different type of Spirit coffee

**Name of the Programme: Bachelor of Computer Science B.Sc (Hotel Management & Catering Science)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Specific Outcome(PSO):**

PSO1	Gain Knowledge to get a sustainable hospitality job in various sectors of it.
PSO2	Apply food etiquettes and skills while serving a guest
PSO3	Construct leadership and team spirit shaping into industry ready candidates

**Name of the Programme: Bachelor of Science - B.Sc (Hotel Management & Catering Science)**  
**For Candidates admitted in the Colleges affiliated to Periyar University from 2021-2022 onwards**

**Programme Outcome(PO):**

PO1	Understand the upgraded outline of Hospitality industry and its operations
PO2	Aquire the Knowledge of Plan and execute the restaurant menu of multiple cuisine - Preparation & Service
PO3	Application of beverage production knowledge in manufacturing factories as well as the service procedure of Beverages
PO4	Analyze the room sales revenue with the maintenance of Rooms, Guest areas & Non Guest areas

**COURSE OUTCOME**

**Name of the Programme: Bachelor of Computer Science B.Sc (Hotel Management & Catering Science)**

SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
	Core - IV	Bakery and Confectionery	Ability to identify and use the bakery equipment and tools Understand the role of ingredients used in bread making Perform to prepare different types of Cakes Exhibit skills and techniques applied in chocolate preparation Analyze the different types of Pastry
	Core - V	Food Production & Patisserie II	Remembering Spices masalas and condiments Ability to Understand heritage of Indian cuisine Apply the knowledge on process of making Indian Cuisine Exhibit skills in the preparation of Indian Sweets Analyze the food cost control

III	Core - VI	Accommodation Operation -II	List out the types of stain Ability to understand the steps involved in uniform and sewing room activity Calculate and prepare the budget Apply safety measures and First aid techniques Categorize the style of flower arrangement
	Elective - I	Hotel French	Remembering French language basics Ability to understand the culinary terms. Ability to understand the French numerical Analyze the different types of Menu items in French term Demonstrate the conversation related to restaurant
	Allied - III	Hotel Accounting	Understanding Basics of Accounting Ability to understand the Financial Statement Ability to understand the Costing Analyze the Food and Beverage Accounts cost concept Able to Know about Room occupancy percentage
	SBEC - I	Hospitality Communication-I	Understanding About Business Communication Ability to understand the Listening on the Job Ability to conduct effective Speaking Demonstrating Non Verbal Communication
	Practical - V	Bakery and Confectionery	Categorize the style of flower arrangement Comprehend the functions of ingredients for bread and cake Demonstrate kneading practices to enhance the bakery products quality Categorize various types of icing Create various pastry cake products using basic principles
	Practical - VI	Accommodation Operation -II	Ability to identify and select the laundry equipment Comprehend the functions of Cleaning agents used for removal of stains Ability to select the stain and apply proper chemical Categorize the Styles of flower arrangement Develop skill and create flower arrangement
IV	Core - VII	Food & Beverage Service-II	Ability to identify different types of wines Ability to understand sparkling wine procedure Ability to apply the procedure involved in production of Beer Demonstrate steps involved in production of Spirits Analyze the different type of Spirit coffee
	Core - VIII	Tourism Marketing	Recall important tourist place in India Describing the Geographical Components of Tourism Illustrating check in formalities procedure of domestic and International Airports Applying knowledge on Indian folk dance Analyzing about classical dance in India
	Elective - II	Hotel Administration And Entrepreneurship	Developing and Managing Your Multinational Career Scientific Approach to Managing Hospitality Operations Analysing Revenue Management & Demand Management Ability of Raising money for starting and growing businesses
	Allied - IV	Front Office Operation-II	List out the mode of settlement of bills Discuss Night Auditing procedure Ability to prepare Front Office Accounting reports Ability to use different property management system Calculate and compare occupancy percentage
	Practical - VII	Food Production & Patisserie-II	Identify the fabricated meat cut and equipment for Tandoor dishes Ability to understand the familiar dishes different regions in India  Demonstrate the skills in the preparation of Indian regional dishes  Analyze the regional cuisine dishes in popular Evaluate the recipes and preparation method in popular Indian regional dishes
	Practical - VIII	Food and Beverage Service-II	Remembering and use the food and beverage service equipment Classify the different types wine Demonstrate the service procedure of alcoholic beverages Demonstrate the service procedure of cigar and cigarettes Analyze the operations of bar
Practical - IX	Front Office Operation-II	Remembering Countries and their Capitals Ability to understand check-in and checkout procedure To handle the situation of left luggage Analyzing the Guest Departure Procedure Analyzing the Suggestive selling procedure	
III	NMEC - I	Front Office Management	Able to Know about hotel history and all hotel Operations Ability to prepare Duty rota for Front office staff Ability to perform different guest service Calculate and compare occupancy percentage Knowing about the guest reservation & Guest cycle
IV	NMEC - II	Principles of Tourism	Knowing the History & types of Tourism Ability to understand the Indian cultural Heritage Under Standing the various forms of oraganization  Understanding the basics of Room Tariff Ability to work in any tourism department with basic knowledge

**Name of the Programme: Bachelor of Computer Science B.Sc (Hotel Management & Catering Science)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2019-2020 onwards**

**PSO2** Apply food etiquettes and skills while serving a guest

**PSO3** Construct leadership and team spirit shaping into industry ready candidates

**Name of the Programme: Bachelor of Science - B.Sc (Hotel Management & Catering Science)  
For Candidates admitted in the Colleges affiliated to Periyar University from 2019-2020 onwards**

**Programme Outcome(PO):**

**PO1** Understand the upgraded outline of Hospitality industry and its operations

PO2	Acquire the Knowledge of Plan and execute the restaurant menu of multiple cuisine - Preparation & Service		
PO3	Application of beverage production knowledge in manufacturing factories as well as the service procedure of Beverages		
COURSE OUTCOME			
Name of the Programme: Bachelor of Computer Science B.Sc (Hotel Management & Catering Science)			
SEMESTER	STUDY COMPONENTS	COURSES	COURSE OUTCOME
V	Core - IX	Food Production & Patisserie-III	Describing the preparation method and types of larder by products
			Applying knowledge of ingredients used in the Cold Kitchen
			Able to know all about sandwiches
			Analyzing the kitchen stewarding department and its various job performance
	Core - X	Food & Beverage Service III	Remembering the different types of menu Compiling
			Ability to understand the Flambe
			Use different types of equipment for Flambe
			Displaying different dishes prepared on the Flambe
	Core - XI	Hotel Engineering	Analyzing the order taking procedure for different menu
			Consider the impact of facility design on Facility Management
			Analyzing Maintenance management system
			Justify Personnel management in Maintenance
	Core - XII	Event Management	Compare and Justify costs associated with hospitality facility
Able to fire fight in case of emergencies			
Basic Knowledge about Events organizing in Hotels			
Procedure to conduct a event and FP filling			
Practical - XI	Hotel Engineering	Staff Planning for Function catering	
		Able to conduct all theme functions in Hotels	
		Gaining Knowledge about Facility Management	
		Preparing Maintenance management system	
Practical - XII	Training Report & viva voce-II	Justify Personnel Management in Maintenance	
		Compare and Justify costs associated with hospitality facility	
		Able to fire fight in case of emergencies	
		Able to Prepare basic dishes that are available in that particular hotel	
Practical - XIII	Food Production & Patisserie-III	Application on curriculum knowledge in various service outlets	
		Basic Knowledge about Rooms Division department	
		Analyze the Menu Compiling Knowledge	
		Perform various Front Office Operations	
VI	Core - XIII	Food & Beverage Management	Identify the equipment for different types of carving
			Discuss different types of menu
			Perform different types of menu
			To prepare and present plate garnish, vegetable and fruit carving
	Core - XIV	Travel & Tourism Management	Analyze the different types of menu
			Remembering the different types of menu
			Ability to understand the dishes prepared on the Guéridon
			Use different types of equipment for Guéridon service
	Core - XV	Application of Computer in Hospitality and Tourism Industry	Displaying different dishes prepared on the Guéridon
			Recall important tourist place in India
			Describing the Geographical Components of Tourism
			Illustrating check in formalities procedure of domestic and International Airports
	Practical - XIII	Food Production & Patisserie-III	Applying knowledge on Indian folk dance
Analyzing about classical dance in India			
Remembering the basic operations of MS Office			
Ability to Understand about Applications & Internet usage			
Practical - XIV	Food & Beverage Service-III	Apply the knowledge on process of creating Social media pages	
		Exhibit skills in HMS Software	
		Analyze the advancement of computers	
		Identify the equipment for different types of carving	
Practical - XV	Application of Computer in Hospitality and Tourism Industry	Discuss different types of menu	
		Perform different types of menu	
		To prepare and present plate garnish, vegetable and fruit carving	
		Analyze the different types of menu	
Practical - XIV	Food & Beverage Service-III	Remembering and use the food and beverage service equipment	
		Students able to preparing duty routine	
		Demonstrate the different style of buffet display	
		Students able to diagram different style of buffet set up	
Practical - XV	Application of Computer in Hospitality and Tourism Industry	Compare different style of banquet menu	
		Identify the various tools used in MS Office	
		Discuss different types of Excel Formulas	
		Perform different types of HMS Software update	
Practical - XV	Application of Computer in Hospitality and Tourism Industry	To prepare and present various reports used in Hotel	
		Analyze the different types Social media surfing safely	