PROGRAMME OUTCOMES AND COURSE OUTCOMES

B.A ENGLISH

PROGRAMME OUTCOMES

- **Objectives**
  - Educate students in both the artistry and utility of the English language through the study of literature and other contemporary forms of culture.
  - Provide students with the critical faculties necessary in an academic environment, on the job, and in an increasingly complex, interdependent world.
  - Graduate students who are capable of performing research, analysis, and criticism of literary and cultural texts from different historical periods and genres.
  - Assist students in the development of intellectual flexibility, creativity, and cultural literacy so that they may engage in life-long learning**.**
- **Outcomes**
  - Students should be familiar with representative literary and cultural texts within a significant number of historical, geographical, and cultural contexts.
  - Students should be able to apply critical and theoretical approaches to the reading and analysis of literary and cultural texts in multiple genres.
  - Students should be able to identify, analyze, interpret and describe the critical ideas, values, and themes that appear in literary and cultural texts and understand the way these ideas, values, and themes inform and impact culture and society, both now and in the past.
  - Students should be able to write analytically in a variety of formats, including essays, research papers, reflective writing, and critical reviews of secondary sources.
  - Students should be able to ethically gather, understand, evaluate and synthesize information from a variety of written and electronic sources.
  - Students should be able to understand the process of communicating and interpreting human experiences through literary representation using historical contexts and disciplinary methodologies.
- **B. A. English**
  - **Course Outcome**

    Semester I

- ENCR1- Methodology of Humanities and Literature
  - To know and appreciate the location of literature within humanities
  - To establish connections across frontiers of disciplines

- To critically engage with culture, gender and marginality
- To become acquainted with narration and representation.

Semester II

- ENCR2- Introduction to Language and Literature
  - Appreciate, interpret and critically evaluate literature.
  - Form an idea about the various stages in the development of English language.
  - Distinguish between the different varieties of English used all over the world.

Semester III

- ENCR3- Literature and Informatics
  - The students should have a thorough general awareness of computer hardware and software and have good practical skill in performing common basic tasks with the computers.
  - The students are expected to create PowerPoint presentations on any topic in literature incorporating extensively researched web sources.

Semester IV

- ENCR4- Reading Prose
  - To develop critical thinking in students
  - To enable them to write and appreciate different types of prose

Semester V

- **ENCR5- Reading Poetry**
  - To introduce the students to the basic elements of poetry- to enrich the students through various perspectives readings in poetry
- **ENCR6- Reading Fiction**
  - To develop critical thinking and imagination through long and short fiction and to familiarize students with cultural diversity through different representative samples of fiction.
- **ENCR7- Reading Drama**
  - On completion of the course, the students should be familiar with the plays of master- dramatists and will have developed the ability to appreciate and evaluate various types of plays.
- **ENCR8- Language and Linguistics**
  - To lead to a greater understanding of the human communicative action through an objective study of language.
  - To familiarize students with the key concepts of linguistics and develop awareness of the latest trends in language study.

- To help students move towards better and intelligible pronunciation and to improve the general standard of pronunciation in everyday conversation.

- **ENCR 9-Literary Criticism: Theory and Practice**
  - Become able to differentiate between judgment and appreciation.
  - To get in touch with various movements and schools of thought
  - To equip them to attempt practical criticism of plays, passages and poems

Semester VI

- **ENCR 10- Post Colonial Literatures**
  - The students will be familiar with literary productions that address issues related to cultural identity in colonized societies, the development of a national identity after colonial domination, and the ways in which writers articulate and celebrate such identity.
  - The students will have been acquainted with the resistance of the colonized against the colonizer through literature that articulates it.
- **ENCR11- Women's Literature**
  - The students will have an awareness of class, race and gender as social constructs and about how they influence women's lives.
  - The students will have acquired the skill to understand feminism as a social movement and a critical tool.
  - They will be able to explore the plurality of female experiences.
  - They will be equipped with analytical, critical and creative skills to interrogate the biases in the construction of gender and patriarchal norms
- **ENCR12- Indian Writing in English**
  - To provide an overview of the various phases of the evolution of Indian writing in English.
  - To introduce students to the thematic concerns, genres and trends of Indian writing in English.

- **ENCR13- Comparative Literature**
  - To inculcate in the pupil a feel of various methods employed to identify shared features of various literatures and to equip him/her to make comparative and contrastive analysis of literary texts.
- **ENCR14- American Literature**
  - To acquire knowledge about American literature, its cultural themes, literary periods and key artistic features.
  - To understand the various aspects of American society through a critical examination of the literary texts representing different periods and cultures.

- **B A ECONOMICS**

Programme Outcome

- ***The principal aims of objectives of the BA Economics programme are:***
- To provide students a well-founded education in Economics;
- To provide structured curricula which support the academic development of students;
- To provide and adapt curricula that prepare our graduates for employment and further study as economists
- To provide the students with the opportunity to pursue courses that emphasizes quantitative and theoretical aspects of Economics.
- To provide students with the opportunity to focus on applied and policy issues in Economics.
- To provide programmers that allow the students to choose from a wide range of economic specialization;
- To provide a well-resourced learning environment for Economics.

Course outcome

Semester I

- **Methodology of Social Sciences with special Reference to Economics (EM01BA901)**
    - The course intends to familiarize the students with the broad contours of Social Sciences, specifically Economics and its methodologies, tools and analysis procedures.
    - The course also aims to create an enthusiasm among students about different schools of Economic thought and various aspects of social science research, methodology, concepts, tools and various issues.
    - To familiarize the students, Science-Different branches of science;
    - To familiarize the students Evolution of a scientific approach Social science;
    - To disseminate the students Need for interdisciplinary approach;
    - To publicize the students Objectivity and subjectivity in social Science;
    - To familiarize the students Limits to objectivity in social science;

Semester II

- **Core 2: Development and Environmental Economics (EMO2BA901)**
    - To enable the students to understand the theories and strategies of growth and development.
    - To impart knowledge about the issues relating to sustainable development, Environment protection and pollution control measures.

Semester III

- **Core 3: Principles of Micro Economics (EM03BA901)**

- This Course is designed to provide basic understanding of micro economic concepts, behaviour of economic agent-consumer, producer, and factor owner –price fluctuations in the market.
- The module includes in this course deal with the concepts of consumer behaviour, production, market, factor pricing and welfare Economics.

Semester IV

- **Core 4: Modern banking (EMO3BA902)**
  - Banking has a long history in the world. It has undergone profound changes in recent years especially after the far-reaching banking sector reforms in India and elsewhere.
  - The present course is designed to acquaint the students with the working of banks and to familiarize them with the basic principles and concepts which are often used in banking literature.

Semester V

- **Core 5: Micro Economic Analysis (EM04CR001)**

  To familiarize with
  - Theory of costs – traditional theory of costs – short run and long run –m real cost –money cost, explicit and implicit cost- sunk cost – total cost – average cost –marginal cost – reasons for the U shape of the average cost curve – short run and long run cost curves – envelope curve – modern theory of cost- short run and long run curves – 'L' shaped and 'saucer' shaped curves**.**
- **Core 6: Public Economics (EM04BA902)**
  - The Purpose of this course is to give an perceptive about the role of state in
  - Fostering the economic activities via budget and fiscal policies.
  - This course enables the students to understand the various issues between central and State Government.
- **Core 7: Quantitative techniques for Economic Analysis (EM05CROO2)**
  - The objective of this course is to equip the students with primary statistical and mathematical tools for analyzing economic problems.
- **Core 8: Principles of Macro Economics (EM05CR001)**
  - This course is designed to make the students aware of the theoretical aspects of Macro Economics.
- **Core 9: Indian Economy (EM05BA903)**
  - The objectives of the course are to equip the students with the theoretical,
  - empirical and policy issues relating to the society, policy and economy of India.

- The course, in particular, has been prepared in the background of the globalization process and its diverse ramifications on the knowledge economy.

- **Core 10: Economics of Financial Markets (EM05BA904)**

  - Financial institutions and markets play a significant role in all the modern
  - economies of the world.
  - The study of this area is significant especially after the financial sector reforms in most of the countries.
  - The present course is designed to acquaint the students with the changing role of the financial sector of the economy.
  - The stake holders are to familiarize with the concepts, the financial institutions and markets.

Semester VI

- **Core 12: Macro Economic analysis (EM06CR002)**

  - This course equips the students to understand systems facts and the latest theoretical developments in Macro Economics.

- **Core 13: Development Issues of the Indian economy (EM06BA907)**

  - The objectives of the course are to equip the students with the theoretical, empirical and policy issues relating to the society, polity and economy of India.
  - The course in particular, has been prepared on the background of the globalization process and its diverse ramifications on the knowledge economy.

- **Core 15: International Economics (EM06BA904)**

  - The objectives of this course are to arrive at an understanding of theories of international trade and to examine the impact of the trade policies on the dynamic gains.

B.COM TAX

PROGRAMME OUTCOME

- To build a strong foundation of knowledge in different areas of Commerce
- To develop the skill of applying concepts and techniques used in Commerce
- To develop an attitude for working effectively and efficiently in a business environment
- To integrate knowledge, skill and attitude that will sustain an environment of learning and creativity among the students
- To expose students about entrepreneurship

- To enable a student to be capable of making decisions at personal and professional level
- To have an understanding of determination of Total Income and tax payable
- To get an overview regarding returns to be filed by an individual and also assessment procedure

B.COM TAX COURSE OUTCOME

SEMESTER-I

CORE-1 BUSINESS STATISTICS

• To provide basic knowledge of statistical techniques as are applicable to business.

• To enable the students to apply statistical techniques for quantification of data in Business

CORE-2 MODERN BANKING

1. To provide basic knowledge of banking.

2. To familiarize the students with the changing scenario of Indian Banking

CORE-3 BUSINESS REGULATORY FRAMEWORK

1. To provide a brief idea about the framework of Indian Business Laws.

2. To enable the students to apply the provisions of business laws in business activities

COMMON -1 PERSPECTIVES AND METHODOLOGY OF BUSINESS STUDIES

• To understand business and its role in society

• To understand entrepreneurship and its heuristics

• To comprehend the business environment

• To enable the student to undertake business activities

SEMESTER-II

CORE-4 QUANTITATIVE TECHNIQUES FOR BUSINESS RESEARCH

• To impart basic knowledge of research

• To enable the students to apply the simple statistical tools in business research

CORE-5 PRINCIPLES OF INSURANCE

• To make the students explore with the fundamental principles of insurance

• To impart knowledge on practice of insurance business

CORE-6 CORPORATE REGULATIONS AND GOVERNANCE

 to provide an understanding regarding the administration and management of corporate form of business

 to give a firsthand exposure to corporate laws especially Indian Companies Act 1956.

COMMON -2 BUSINESS COMMUNICATIONS AND MANAGEMENT INFORMATION SYSTEM

 To familiarise the importance of communication in business and methods of communication relevant to various business situations

 To build up communication skill among students.

SEMESTER –III

CORE-7 MARKETING MANAGEMENT

1. To help students to understand the concept of marketing and its applications.

2. To make the students aware of modern methods and techniques of marketing.

CORE-8 FINANCIAL ACCOUNTING

 To familiarize the students with the accounting principles and practices of various types

of business other than companies.

CORE-3 E-COMMERCE AND GENERAL INFORMATICS

 The objective of this course is to make the students familiar with the mechanism of

conducting business transactions through electronic media

CORE-9 BUSINESS MANAGEMENT

 To familiarize the students with concepts and principles of Management

SEMESTER-IV

CORE-10. CAPITAL MARKET

1. To give the students an overall idea about Capital market..

2. To familiarise the students with capital market operations in India.

CORE-11 CORPORATE ACCOUNTING

 To provide a thorough knowledge about the accounting of companies

COMMON -4 ENTREPRENEURSHIP DEVELOPMENT AND PROJECT MANAGEMENT

 To equip the students a craving for individual freedom, initiative and enterprise by pursuing self employment and small business entrepreneurship as a viable alternative to salaried employment.

CORE-12 FINANCIAL SERVICES

1. To provide the students with an overall idea of financial service available in the country.

2. To create an understanding about recent trends in financial services sector.

CORE (OPTIONAL)-2 VALUE ADDED TAX-CONCEPTS AND PRACTICES

 The objective of the course is to provide an understanding of the concept of Value Added Tax Scheme and provide an insight into the aspects and procedures in connection with Kerala Value Added Tax Act and Rules, which are useful to the emerging entrepreneurs.

 The course aims to enable the students to practice as tax consultants after graduation

SEMESTER-V

CORE-13 COST ACCOUNTING

• To familiarise the students with cost concepts

• To make the students learn the fundamentals of cost accounting as a separate system of accounting.

CORE-14 SPECIAL ACCOUNTING

 The purpose of the paper is to acquaint the students with advanced accounting principles and procedures

CORE (OPTIONAL)-3 INCOME TAX LAW AND PRACTICE

 To familiarise the students with Income Tax Act 1961

 To enable the students to compute Income taxable under the first three heads of Income

SEMESTER-VI

CORE-15 APPLIED COST ACCOUNTING

1. To acquaint the students with different methods and techniques of costing.

2. To enable the students to identify the methods and techniques applicable for different types of industries.

CORE-16 PRACTICAL AUDITING

1. To familiarize the students with the principles and procedure of auditing.

2. To enable the students to understand the duties and responsibilities of auditors and to

undertake the work of auditing.

CORE-17 ACCOUNTING FOR MANAGERIAL DECISION

1. To equip the students to interpret financial statements.

2. To enable the students to have a thorough knowledge on the management accounting techniques in business decision making

CORE (OPTIONAL)-3 INCOME TAX ASSESSMENTS AND PROCEDURE

 To have an understanding of determination of Total Income and tax payable

 To get an overview regarding returns to be filed by an individual and also assessment.

B. Sc. Mathematics

PROGRAM SPECIFIC OUTCOMES

After the successful completion of this course, the student will:

- Be able to explain the core ideas and the techniques of mathematics at the college level.
- Be able to recognize the power of abstraction and generalization, and to carry out investigative mathematical work with independent judgment.
- Be able to setup mathematical models of real world problems and obtain solutions in structured and analytical approaches with independent judgment.
- Be able to carry out objective analysis and prediction of quantitative information with independent judgment.
- Be able to communicate effectively about mathematics to both lay and expert audiences utilizing appropriate information and communication technology.

- Be able to work independently, and to collaborate effectively in team work and teambuilding.
- Be able to conduct self-evaluation, and continuously enrich themselves through lifelong learning.
- Be able to communicate to lay audiences and arouse their interest in the beauty and precision of mathematical arguments and science.
- Be able to recognize the importance of compliance with the ethics of science and being a responsible citizen towards their community and a sustainable environment.
- Be able to cultivate a mathematical attitude and nurture the interests.

Course Outcomes

First Semester

MM1B01: Foundation of Mathematics

On completion of this course, successful students will be able to:

- prove statements about sets and functions;
- analyze statements using truth tables;
- Construct simple proofs.
- Familiarize mathematical Symbols and standard methods of proofs.

Second Semester

MM2B01: Analytic Geometry, Trigonometry and Matrices

On completion of this course, successful students will be able to:

- find the equation to tangent, normal at a point on a conic;
- find the polar equation of a line, circle, tangent and normal to conics
- familiarize real and imaginary parts of a circular and hyperbolic functions of a complex variable
- solve a System of Linear equations using the inverse of a matrix
- familiarize characteristic roots and characteristic vectors.
- to find the inverse of a matrix by Cayley-Hamilton theorem

Third Semester

MM3B01: Calculus

After completing this course the learner should be able to

- Find the higher order derivative of the product of two functions.
- Expand a function using Taylor's and Maclaurin's series.
- Conceive the concept of asymptotes and obtain their equations.
- Learn about partial derivatives and its applications.
- Find the area under a given curve, length of an arc of a curve when the equations are given in parametric and polar form.
- Find the area and volume by applying the techniques of double and triple integrals

Fourth Semester

MM4B01: Vector Calculus, Theory of Equations And Numerical methods

After completing this course the learner should be able to

- Represent vectors analytically and geometrically, and compute dot and cross products for presentations of lines and planes,
- Analyze vector functions to find derivatives, tangent lines, integrals, arc length, and curvature,
- Compute limits and derivatives of functions of 2 and 3variables,
- Apply derivative concepts to find tangent lines to level curves and to solve optimization problems,
- Evaluate double and triple integrals for area and volume,
- Differentiate vector fields
- Determine gradient vector fields and find potential functions
- Analyze the fundamental theorem of calculus and see their relation to the fundamental theorems of calculus in calculus, leading to the more generalized version of Stokes' theorem in the setting of differential forms.
- Evaluate line integrals directly and by the fundamental theorem
- Analyze different forms of equations and finding their roots
- Understand relation between roots and coefficients
- Derive numerical methods for approximating the solution of problems of continuous mathematics,
- Analyze the error incumbent in any such numerical approximation,
- Implement a variety of numerical algorithms using appropriate technology
- Compare the viability of different approaches to the numerical solution of problems arising in roots of solution of non-linear equations, interpolation and approximation, numerical differentiation and integration, solution of linear systems.

Fifth Semester

MM5B01: Mathematical Analysis

After completing this course the learner should be able to

- Describe the real line as a complete, ordered field
- Determine the basic topological properties of subsets of the real numbers
- Use the definitions of convergence as they apply to sequences, and functions,
- Determine the continuity, differentiability, and integrability of functions defined on subsets of the real line
- Apply the Mean Value Theorem and the Fundamental Theorem of Calculus to problems in the context of real analysis
- Produce rigorous proofs of results that arise in the context of real analysis.
- Write solutions to problems and proofs of theorems that meet rigorous standards based on content, organization and coherence, argument and support, and style

MM5B02: DIFFERENTIAL EQUATIONS

After studying this course the students should be able to

- Obtain an integrating factor which may reduce a given differential equation into an exact one and eventually provide its solution.
- Identify and obtain the solution of Clairaut's equation.
- Fine the complementary function and particular integrals of linear differential equation.
- Familiarize the orthogonal trajectory of the system of curves on a given surface.

- Method of solution of the differential equation
- Describe the origin of partial differential equation and distinguish the integrals of first order linear partial differential equation into complete, general and singular integrals.
- Use Lagrange's method for solving the first order linear partial differential equation
- Solve differential equations of first order using graphical, numerical, and analytical methods,
- Solve and apply linear differential equations of second order (and higher),
- Solve linear differential equations using the Laplace transform technique,
- Find power series solutions of differential equations, and
- Develop the ability to apply differential equations to significant applied and/or theoretical problems.
- Demonstrate their ability to write coherent mathematical proofs and scientific arguments needed to communicate the results obtained from differential equation models
- Demonstrate their understanding of how physical phenomena are modeled by differential equations and dynamical systems
- Implement solution methods using appropriate technology.

MM5B03: Abstract Algebra

After completing this course the learner should be able to

- Assess properties implied by the definitions of groups and rings,
- Use various canonical types of groups (including cyclic groups and groups of permutations) and canonical types of rings (including polynomial rings and modular rings),
- Analyze and demonstrate examples of subgroups, normal subgroups and quotient groups,
- Analyze and demonstrate examples of ideals and quotient rings,
- Use the concepts of isomorphism and homomorphism for groups and rings
- Produce rigorous proofs of propositions arising in the context of abstract algebra.

MM5B04: Fuzzy Mathematics

After the completion of this course the student will be able to:

- Understand fuzzy sets and fuzzy set operations
- To construct the appropriate fuzzy numbers corresponding to uncertain and imprecise collected data.
- To handle the real world problem in engineering having uncertain and imprecise data.
- To find the optimal solution of mathematical programming problems having uncertain and imprecise data.

Open course

MM5D02: Applicable Mathematics

After the completion of this course the student will be able to

- Understanding the basic operations of Mathematics
- Applies shortcut methods for solving problems
- Apply mathematical concepts and principles to perform computations
- Apply mathematics to solve real life problems
- Create, use and analyze graphical representations of mathematical relationships
- Communicate mathematical knowledge and understanding

- Apply technology tools to solve problems
- Perform abstract mathematical reasoning
- Learning dependently
- Compute limits, derivatives, and definite & indefinite integrals of algebraic, logarithmic and exponential functions
- Analyze functions and their graphs as informed by limits and derivatives
- Familiarize with basic operations on real numbers, logarithms and quadratic equations
- Identify the definitions of trigonometric ratios and their applications to problems involving heights and distance
- Get basic ideas of two dimensional geometry and graphing straight lines
- Use various methods to compute the probabilities of events
- Acquires basic ideas of derivatives, standard results and various rules for finding the derivatives of functions
- Differentiate integration from differentiation and integration of simple functions
- Acquires the basic arithmetic skills involving percentages, averages, time and rates, elementary algebra and geometry.

Sixth Semester

MM6B01: Real Analysis

After the completion of this course the student will be able to:

- Understand the term convergence
- Applies this term into problems
- Illustrate the convergence properties of power series
- Identifies Continuity and Discontinuity of various functions in different contexts
- Distinguish Uniform continuity from continuity and related theorems
- Understand partitions and their refinement
- Understand Integrability and theorems on integrability
- Recognize the difference between point wise and uniform convergence of a sequence of functions
- Illustrate the effect of uniform convergence on the limit function with respect to continuity, differentiability, and integrability

MM6B02: COMPLEX ANALYSIS

On completion of this course, the students will be able to

- Compute sums, products, quotients, conjugate, modulus, and argument of complex numbers
- Define and analyze limits and continuity for complex functions as well as consequences of continuity
- Conceive the concepts of analytic functions and will be familiar with the elementary complex functions and their properties
- Determine whether a given function is differentiable, and if so find its derivative
- Use differentiation rules to compute derivatives
- Write complex numbers in polar form
- Evaluate exponentials and integral powers of complex numbers
- Find all integral roots and all logarithms of nonzero complex numbers
- Apply the concept and consequences of analyticity and the Cauchy Riemann equations and of results on harmonic and entire functions including the fundamental theorem of algebra
- Find parameterizations of curves, and compute complex line integrals directly
- Understand the theory and techniques of complex integration

- Applies the theory into application of the power series expansion of analytic functions
- Understand the basic methods of complex integration and its application in contour integration.

MM6B03: Discrete Mathematics

After the completion of this course the student will be able to

- Understand the new topics Graph Theory, Cryptography, Po set and Lattices
- Understand the basic concepts of graphs, directed graphs, and weighted graphs and able to present a graph by matrices
- Understand the properties of trees and able to find a minimal spanning tree for a given weighted graph
- Understand Eulerian and Hamiltonian graphs
- Applies the basic logic of Cryptography into various problems
- Compare and contrast a range of different cryptosystems from an applied viewpoint
- List and elaborate the differences between secret key and public key crypto systems
- Identify the different approaches to quantifying secrecy
- Recognize the different modes of operation for block ciphers and their applications
- Explain the role of hash functions in Information Security
- Discuss the place of ethics in the Information Security Area
- Recognize lattices, complete ordered sets and their varieties
- Know the standard tools of lattice theory
- Know the main representation theorems of lattices
- Be able to make use all the above both inside the theory and applications

MM6B04: Linear Algebra and Metric Spaces

Upon completion of this course, students should be able to:

- Understand the idea about vector space and metric space
- Analyze finite and infinite dimensional vector spaces and subspaces over a field and their properties, including the basis structure of vector spaces
- Use the definition and properties of linear transformations and matrices of linear transformations and change of basis, including kernel, range and isomorphism
- Compute with the characteristic polynomial, eigenvectors, Eigen values and Eigen spaces, as well as the geometric and the algebraic multiplicities of an Eigen value and apply the basic diagonalization result
- Recall the defining properties of a metric space, and determine whether a given function defines a metric
- Determine how that a function is or is not a metric
- Show that a set in a metric space is or is not open and/or closed
- Show that a function between metric spaces is or is not continuous
- Show that a sequence in a metric space is or is not convergent
- Show that a metric space is or is not complete
- Familiarize with open sets, closed sets and Cantor set

MM6D01: Operations Research

Upon completion of this course, students should be able to:

- Understand the new term LPP

- Applies the theory into different types of problems

- Understand Transportation Problem, Assignment problem and Queuing models
- Solving problems using different methods
- Formulate and model a linear programming problem from a word problem and solve them graphically in 2 and 3 dimensions, while employing some convex analysis
- Place a Primal linear programming problem into standard form and use the Simplex Method or Revised Simplex Method to solve it
- Find the dual, and identify and interpret the solution of the Dual Problem from the final tableau of the Primal problem
- Be able to modify a Primal Problem, and use the Fundamental Insight of Linear Programming to identify the new solution, or use the Dual Simplex Method to restore feasibility
- Interpret the dual variables and perform sensitivity analysis in the context of economics problems as shadow prices, input values, marginal values, or replacement values
- Explain the concept of complementary slackness and its role in solving primal/dual problem pairs
- Classify and formulate integer programming problems and solve them with cutting plane methods, or branch and bound methods
- Formulate and solve a number of classical linear programming problems and such as the minimum spanning tree problem, the assignment problem, (deterministic) dynamic programming problem, the knapsack problem, the XOR problem, the transportation problem, the maximal flow problem, or the shortest path problem, while taking advantage of the special structures of certain problems
- Understands duality theorems and dual simplex method
- Uses dual simplex method to find optimal solutions
- Explains the Transportation Problem and formulate it as an LPP and hence solve the problem
- Determine that an Assignment Problem is a special case of LPP and hence solve by Hungarian method
- Identifies the Queuing models, their various forms and methods of solutions

B.Sc. Physics

PROGRAMME OUTCOMES

1. Read, understand and interpret physical information – vocal, statistical and graphical.

2. Equip students in methodology related to Physics.

3. Impart skills required to gather information from resources and use them.

4. To give need based education in physics of the highest quality at the undergraduate level.

5. Offer courses to the choice of the students with interdisciplinary approach.

6. Perform experiments and interpret the results of observation, including making a

conclusion of experimental uncertainties.

7. Provide a rationally motivating environment to develop skills and aptitude of talented students to the best of their potential.

8. Use Information Communication Technology to congregate knowledge at will.

9. Provide an intellectual ambience to all the students to soak up the scientific attitude

Programme specific outcomes

SEMESTER I

PH01BA901 - METHODOLOGY IN PHYSICS.

OUTCOME:

By learning this course, students will get an introduction to the pursuit of Physics, its history and methodology. The students also learn the importance of measurement and the methodology of using different measuring devices which is central to physics.

SEMESTER II

PH02BA901-MECHANICS AND PROPERTIES OF MATTER

OUTCOME: This course would empower the student to acquire engineering skills and practical knowledge, theoretical basis for doing experiments in related areas, which help the student in their everyday life. Students will gain basic knowledge for their higher studies.

SEMESTER III

PH03CR001-ELECTRONICS

OUTCOME: The physical principles and applications of Electronics which is most necessary for a Physics student is understood by this course.

SEMESTER IV

PH34CR001-ELECTRICITY AND ELECTRODYNAMICS

OUTCOME: Electricity and Electrodynamics have the key role in the development of modern technological world. Without electric power and communication facilities, life on earth stands still. By this course student get a sound foundation in electricity and electrodynamics.

.**SEMESTER V**

PH05BAA01-CLASSICAL AND QUANTUM MECHANICS

OUTCOME: The theoretical background to study Condensed Matter Physics, Spectroscopy,

Astrophysics, Electrodynamics and Nuclear Physics is gained by this course

PH05BA901-PHYSICAL OPTICS AND PHOTONICS

OUTCOME: foundation in optics and photonics is gained by this course and which which

prepare the students for an intensive study of advanced topics at a later stage.

PH05BA902-THERMAL AND STATISTICAL PHYSICS

OUTCOME: Working knowledge of statistical mechanic is gained by this course and which

may be used to explore various applications related to topics in material science and the physics of condensed matter.

PH05BA903-DIGITAL ELECTRONICS

OUTCOME: necessary back ground for applications of electronics in mathematical computation is gained by this course.

Open course

PH05DAP02-ENERGY AND ENVIRONMENTAL STUDIES

OUTCOME: The course creates concern among the students on energy conservation and

environmental protection.

SEMESTER VI

PH06BA901-Computational Physics

OUTCOME: **a**n insight to computer hardware and computer applications is given by this course.

PH06BA902-NUCLEAR AND PARTICLE PHYSICS

OUTCOME: This course explores the interior of nucleus and interaction between nucleons and develops a research interest in nuclear physics.

PH06BA903-CONDENSED MATTER PHYSICS

OUTCOME: An introduction to the physics of Condensed Matter is given by this course. Knowledge and explanation on various on T types of phenomena like electro-magnetic properties, super-conductivity and super fluidity is given.

PH06BA904-RELATIVITY AND SPECTROSCOPY

OUTCOME: Principles of spectroscopy and its applications and basic idea of relativity is given to the students.

COURSE OUTCOMES

Semester I

PH01BA901- Methodology in Physics.

OBJECTIVES: This course will be an introduction to the pursuit of Physics, its history and methodology. The course also aims at emphasizing the importance of measurement which is central to physics.

Semester II

PH02BA901-MECHANICS AND PROPERTIES OF MATTER

OBJECTIVES: This course would empower the student to acquire engineering skills and practical knowledge, which help the student in their everyday life. This syllabus will cater the basic requirements for their higher studies. This course will provide a theoretical basis for doing experiments in related areas.

SEMESTER III

PH03CR001-ELECTRONICS

OBJECTIVES: We are living in a wonder world of Electronics. To know the physical principles and applications of Electronics is most necessary for a Physics student. This course is intended to provide this know-how.

SEMESTER IV

PH34CR001-ELECTRICITY AND ELECTRODYNAMICS

OBJECTIVES: Electricity and Electrodynamics have the key role in the development of modern technological world. Without electric power and communication facilities, life on earth stands still. A course in electricity and electrodynamics is thus an essential component of physics programme at graduate level. This course is expected to provide a sound foundation in electricity and electrodynamics.

SEMESTER V

PH05BAA01-CLASSICAL AND QUANTUM MECHANICS

OBJECTIVES: This course is a prelude to advanced theoretical studies in Condensed Matter

Physics, Spectroscopy, Astrophysics, Electrodynamics and Nuclear Physics

PH05BA901-PHYSICAL OPTICS AND PHOTONICS

OBJECTIVES: This course aims to provide necessary foundation in optics and photonics

which prepare the students for an intensive study of advanced topics at a later stage.

PH05BA902-THERMAL AND STATISTICAL PHYSICS

OBJECTIVES: This course is to develop a working knowledge of statistical mechanic and to use this knowledge to explore various applications related to topics in material science and the physics of condensed matter.

PH05BA903-DIGITAL ELECTRONICS

OBJECTIVES: This course is expected to provide necessary back ground for applications of electronics in mathematical computation.

Open course

PH05DAP02-ENERGY AND ENVIRONMENTAL STUDIES

OBJECTIVES: The course creates concern among the students on energy conservation and environmental protection.

SEMESTER VI

PH06BA901-Computational Physics

OBJECTIVES:: This course is intended to give an insight to computer hardware and computer applications.

PH06BA902-NUCLEAR AND PARTICLE PHYSICS

OBJECTIVES: This course intended to explore the interior of nucleus and interaction between nucleons

PH06BA903-CONDENSED MATTER PHYSICS

OBJECTIVES:: This course is intended to provide an introduction to the physics of Condensed Matter. This study attempts to explain various types of phenomena like electro-magnetic properties, super-conductivity and super fluidity

PH06BA904-RELATIVITY AND SPECTROSCOPY

OBJECTIVES: This course is intended to introduce principles of spectroscopy and special theory of relativity.

B.Sc. Chemistry

Program Outcomes

PO1. Critical Thinking: Students are skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems.

PO2. Problem Solving Skills: Students are able to solve problems competently by identifying the essential parts of a problem and formulating a strategy for solving the problem. They are able to rationally estimate the solution to a problem, apply appropriate techniques to arrive at a solution, test the correctness of the solution, and interpret their results.

PO3. Communication Skills: Students are able to communicate effectively their views and ideas clearly in person and through modern media in English and in their mother tongue.

PO4. Modern Tool Usage: Graduates will be able to use computers in data acquisition and processing and use available software as a tool in data analysis.

PO5. Social Responsibility: Students are trained to be an individual with concern for the society they live and to contribute at maximum, their skills and knowledge in the broadest context, for the development of the nation.

PO6. Ethics: Stay firm on the value systems of their culture, including their own for a healthy socio cultural environment.

PO7. Environment and Sustainability: Students are able to appreciate the central role of chemistry in our society and use this as a basis for ethical behaviour in issues facing chemists including an understanding of safe handling of chemicals, environmental issues and key issues facing our society in energy, health and medicine.

PO8. Self-directed and Life-long Learning: Acquire the ability to engage in independent and self learning as well as to successfully pursue their career objectives in advanced education and in professional courses, in a

scientific career in government or industry, in a teaching career in the school systems, or in a related career following graduation.

Program Specific Outcomes

The B.Sc. Chemistry Program is successful in imparting the students with the following qualities.

PSO1: Students have a firm foundation in the fundamentals and application of current chemical and scientific theories including those in Analytical, Inorganic, Organic and Physical branches of chemistry.

PSO2: Acquired the knowledge of terms, facts, concepts, processes techniques and principles of the subject.

PSO3: Developed the ability to apply the principles of Chemistry.

PSO4: Are inquisitive towards advanced chemistry and developments therein.

PSO5: Are able to appreciate the achievements in Chemistry and to know the role of Chemistry in nature and in society.

PSO6: Developed problem solving skills.

PSO7: Familiarized with the emerging areas of Chemistry and their applications in various spheres of Chemical sciences and to apprise the students of its relevance in future studies.

PSO8: Developed skills in the proper handling of apparatus and chemicals.

PSO9: Are exposed to the different processes used in industries and their applications.

Course Outcomes

Course: General and Analytical Chemistry

CO1: Have broad outline of the methodology of science in general and Chemistry in particular

CO2: Understand the important analytical and instrumental tools used for practicing chemistry

CO3: Learn computer based presentation and statistical analysis of data using spreadsheet software

CO4: Apply these skills in the analysis of experimental data in chemistry practical.

Course: Theoretical and Inorganic Chemistry

CO1: Study the various atom models

CO2: Understand the important features of the quantum mechanical model of the atom.

CO3: Study the periodic properties of elements

CO4: Explain the formation of different types of bonds

CO5: Predict the geometry of simple molecules

CO6: Explain the different types of hybridization and draw shapes of simple covalent molecules

CO7: Understand the molecular orbital theory of diatomic molecules

CO8: Develop interest in various branches of inorganic chemistry.

CO9: Study nuclear models and nuclear reactions.

Course: Fundamentals of Organic chemistry

CO1: Have a basic understanding about the classification and nomenclature of organic compounds, fundamentals of organic reaction mechanism, aromaticity and stereochemistry

CO2: Students capable of understanding and studying organic reactions

CO3: Have exposure to various emerging new areas of organic chemistry

CO4: Develop skills required for the qualitative analysis of organic compounds

Course: Basic Organic Chemistry-I

CO1: Learn the chemistry of alcohols, phenols, carboxylic acids, derivatives of Carboxylic acids, Sulphonic acids, carbonyl compounds, poly nuclear hydrocarbons, active methylene compounds and Grignard reagents.

CO2: Understand and study Organic reaction mechanisms.

Course: Chemistry of d and f block elements

CO1: Understand the general characteristics of the d and f block elements.

CO2: Study the physical and chemical properties of d and f block elements.

CO3: Study the Werner's theory of coordination compounds.

CO4: Study isomerism in metal complexes.

CO5: Study the bonding in coordination compounds.

CO6: Understand the applications of coordination compounds.

CO7: Understand the classification, properties and applications of organo metallic compounds.

CO8: Study the methods of preparation, properties, structure and bonding of metal carbonyls and metal clusters.

CO9: Understand the role of metals in biological systems.

Course: Basic Organic Chemistry-II

CO1: Learn the chemistry of nitro compounds, amines, dyes, organic polymers, soaps, detergents and organic reagents.

CO2: Understand and study mechanism of reactions of nitro compounds and amines.

CO3: Have an elementary idea of chemotherapy, organic spectroscopy and photochemistry

CO4: Identify organic compound using UV, IR and PMR spectroscopic techniques

CO5: Develop basic skills required for crystallization, distillation, solvent extraction, TLC and column chromatography.

Course: States of matter

CO1: Study the intermolecular forces in gases and liquids

CO2: Understand the dynamics of the molecules in the gases and liquids

CO3: Study liquefaction of gases

CO4: Learn the structure of solids

CO5: Study defects in crystals

CO6: Study adsorption.

Course: Quantum Mechanics and Spectroscopy

CO1: Differentiate between classical and quantum mechanics

CO2: Study the postulates of quantum mechanics and the quantum mechanical model of the hydrogen atom

CO3: Study valence bond and molecular orbital theory

CO4: Study the principle and applications of microwave, infra red, Raman, electronic and magnetic resonance spectroscopy.

CO5: Study the fundamentals of mass spectrometry

CO6: Study the fundamentals of photochemistry

Course: Applied Inorganic Chemistry

CO1: Understand the principle of inorganic qualitative analysis

CO2: Understand thermodynamic concepts in the extraction of metals

CO3: Understand the applications of radioactivity and radioisotopes

CO4: Understand the preparation and uses of inorganic polymers

CO5: Understand preparation and application of nano materials

CO6: Understand the chemistry of refractory and ceramic materials

CO7: Understand the chemistry of the compounds of p block elements

CO8: Understand thermal and chromatographic techniques

Course: Chemistry of Natural products and Bio molecules

CO1: Learn in detail the chemistry of carbohydrates, heterocyclic compounds, amino

acids, proteins and nucleic acids

CO2: Have a thorough idea on the structures of carbohydrates and some heterocyclic compounds.

CO3: Understand the structure and functions of enzymes, proteins and nucleic acids.

CO4: Study the fundamentals of terpenoids, alkaloids, vitamins, lipids and steroids

CO5: Have an elementary idea of supramolecular chemistry and Green Fluorescent Proteins

Course: Equilibrium and Kinetics

CO1: Study the laws of thermodynamics

CO2: Derive Gibbs-Helmholtz, Clausius-Clapeyron, Gibbs-Duhem equations

CO3: Derive the relation between Kp, Kc and Kx

CO4: Derive the phase rule

CO5: Derive the rate equations for zero, first and second order reactions

CO6: Study the phase diagrams of one and two component systems

CO7: Understand the theories of chemical kinetics

CO8: Acquire an elementary idea of catalysis including enzyme catalsis.

Course: Solution Chemistry

CO1: Study the behaviour of binary liquid mixtures, CST, azeotropes, colligative properties

CO2: Study solubility of gases in liquids,

CO3: Study ionic equilibria and electrical properties of ions in solution.

CO4: Study the concepts of acids and bases, pH and buffer solutions

Course: Polymer Chemistry

CO1: Know about the types of polymers and the chemistry of polymerisation.

CO2: Understand the physical properties of polymers, their reactions and degradation.

CO3: Acquire knowledge about the polymerisation techniques and polymer processing.

CO4: Know the chemistry of individual polymers, their preparation and properties

CO5: Have an idea about the recent advances in polymer science

B.Sc. Zoology

<u>Programme Outcomes</u>

By the end of B Sc programme in Zoology, a student will:

1. Acquire basic knowledge of various branches of Zoology and General biology.
2. Inculcate interest and love of nature with its myriad living creatures.
3. Understand the unity of life with the rich diversity of organisms.
4. Be aware of the ecological and evolutionary significance of the organisms in the environment
5. Acquire basic skills in observation and study of nature.
6. Learn the different biological techniques.
7. Develop experimental skills and research aptitude.

8. Acquire basic knowledge and skills in applied branches of zoology which will enable them for self employment
9. Become aware of the need for conservation of the biosphere.
10. Be skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems.
11. Be able to communicate effectively their views and ideas on different issues related to biology
12. Be equipped to use computers in data acquisition and processing and use available software as a tool in data analysis.
13. Stay firm on the value systems of their culture and work for a healthy socio-cultural environment.
14. Acquire the ability to engage in independent and self learning.
15. Successfully pursue their career objectives in advanced education, professional courses, scientific career, teaching career in the school systems or related career following graduation.

PROGRAMME SPECIFIC OUTCOMES

The graduate of this programme will be able to:

1. Scientifically identify and list out common animals.
2. Identify the role of different animals in the environment.
3. Develop skills to culture the economically beneficial animals and thus open opportunity for self employment.
4. Develop respect for nature.
5. Analyze the impact of anthropogenic activities on environment.
6. Explain the role and impact of different environmental conservation programmes.
7. Understand various physiological processes in living organisms.
8. Identify various potential risk factors to health of humans.
9. Understand various genetic abnormalities and their reasons.
10. Understand the importance of modern branches of science like genetic engineering for the improvement of human race.
11. Use tools of information technology for all activities related to zoology

SEMESTER 1

Course : General Methodology And Perspectives In Science

Course Outcomes

- Awareness of the basic philosophy of science, its history, concepts and scope
- Develop proper scientific mind, culture and work habits

- Familiarize with the basic tools and techniques of scientific study with emphasis on biological sciences
- Develop basic knowledge on various sciences and definitions of scientific terms
- Awareness on role of research in science

SEMESTER 2

Course : Biodiversity And Modern Systematics

Course Outcomes

- Appreciation on diversity of life on earth
- Understand different levels of biological diversity
- Familiarize taxa level identification of animals
- Learn biodiversity estimation techniques
- Create interest for conservation of biodiversity
- Develop Basic knowledge on the living world, plant and animal kingdom
- Acquire knowledge on biodiversity and its conservation
- Be trained on biological classification and representative organism of major taxa

SEMESTER 3

Course : Animal Diversity- Non Chordata

Course Outcomes

Scientifically classify invertebrate fauna.

Learn the physiological and anatomical peculiarities of some invertebrate phyla

Understand evolutionary significance of various invertebrate fauna

Generate curiosity in living things around them.

SEMESTER 4

Course : Animal Diversity- Chordata

Course Outcomes

Generate interest in student to observe the diversity among chordates

Identify systematic position of the different chordates

Learn the physiological and anatomical peculiarities of some vertebrate phyla

Understand evolutionary significance of various vertebrate fauna

Awareness of the economic importance of some classes.

SEMESTER 5

Course : Cell Biology And Molecular Biology

Course Outcomes

- Awareness of different cell organelles, their structure and role in living organisms.
- Understand the nature of genetic materials at molecular level, their expression and regulation.
- Develop critical thinking, skill and research aptitudes.
- Acquire knowledge about living forms at the molecular level

Course : Environmental Biology, Toxicology and Disaster Management

Course Outcomes

- Develop basic knowledge on ecosystems and their functioning.
- Awareness about food chain, food web and energy flow
- General awareness on pollution and their impacts
- Awareness about various types of anthropogenic pressures on ecosystem
- Participate in designing programmes which will mitigate environmental problems
- Become aware of toxicants, their impacts on human health and environment and remedial measures
- Awareness about disasters, prevention and mitigation measures

Course : Evolution, Zoogeography And Ethology

Course Outcomes

- Acquire knowledge about the evolutionary history of earth (living and non living)
- Learn various tools and techniques for evolutionary studies
- Learn the distribution of animals on earth, its pattern, evolution and causative factors
- Acquire basic knowledge on animal behavioral patterns and their role
- Acquire Basic knowledge on principles of inheritance and variation
- Awareness on molecular basis of inheritance
- A thorough understanding on the mechanism and factors affecting evolution
- Knowledge on origin and evolution of man

Course : Biochemistry, Human Physiology and Endocrinology Course Outcomes

Deep knowledge in biochemistry, physiology and endocrinology.

Understanding various aspects of physiological activities of animals with special reference to humans.

Acquire a broad understanding of the hormonal regulation of physiological processes in invertebrates and vertebrates.

Develop a basic understanding of the experimental methods and designs that can be used for further study and research.

Understanding of the various disorders in animals and their causes

SEMESTER 6

Course : Reproductive and Developmental Biology Course Outcomes

- Acquire basic understanding of the experimental methods and designs related to development in animals.
- Awareness about the impact of environment on development in animals.
- Understanding of the patterns of reproduction in animals and birth defects.
- Provide a basis for further research works related to betterment of human health.

Course : Genetics and Biotechnology Course Outcomes

- Understanding of the central role of genetics and biotechnology in the life of all organisms.
- Learn the concepts related to inheritance of characters in organisms.
- Develop critical thinking skill and research aptitude in frontier areas of the biological science.
- Understand the basic techniques in genetic engineering and its applications.
- Acquire knowledge of the scope of genetic engineering in treatment of diseases.

Course : Microbiology and Immunology Course Outcomes

- Generate interest in frontier areas of biological sciences
- Awareness of the pathogens, health related problems, their origin and treatment.
- Awareness regarding knowledge of modern developments and recent trends in biological sciences
- Generate awareness regarding methods for the prevention of diseases
- Motivate the students towards a healthy lifestyle.

Course : General Informatics, Bioinformatics and Biostatistics Course Outcomes

- Awareness regarding the frontier areas of biological sciences
- Be skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems.
- Develop systematic approach in analysing biological information
- Become equipped to use computers in data acquisition and processing and use available software as a tool in data analysis.
- Updates and expands basic informatics skills and attitudes relevant to the emerging knowledge of society and also to equip the students to effectively utilize the digital knowledge resources in learning

M. Sc. Zoology

Course: Biosystematics and Animal Diversity

Course outcomes:

- Understanding of the principles and practice of systematics.
- Acquire an in-depth knowledge on the diversity and relationships in animal world

- Develop an holistic appreciation on the phylogeny and adaptations in animals

Course: Evolutionary Biology and Ethology

Course outcome

- Understanding on the process and theories in evolutionary biology
- Develops an interest in the debates and discussion taking place in the field of evolutionary biology
- Critically evaluate the debates and take a stand based on science and reason
- Familiarizes the basics and advances in ethology
- generate an interest to understand the complexities of both animal and human behavior

Course: Biochemistry

Course outcome

- Understands the chemical nature of life and life process
- Acquires an idea on structure and functioning of biologically important molecules
- Generates an interest to explore the new developments in biochemistry

Course: Biostatistics, Computer Application And Research Methodology

Course outcome

- Impart concepts, generate enthusiasm and gives awareness about the tools/gadgets and accessories of biological research .
- Equips with basic idea to carry out original research in biology .
- Improves analytical and critical thinking skills through problem solving.
- Hands on training in the use of various tools and techniques in research.
- Become equipped to use computers in data acquisition and processing and use available software as a tool in data analysis.
- Updates and expands basic informatics skills and attitudes relevant to the emerging knowledge of society and also to equip the students to effectively utilize the digital knowledge resources in learning

SEMESTER 2

Course: Ecology: Principles And Practices

Course outcome

- Understands the basic theories and principles of ecology
- Acquires knowledge about various disciplines in ecology
- Learns about current environmental issues based on ecological principles

- Gains critical understanding on human influence on environment

Course: Genetics and Bio Informatics

Course outcome

- Gives an in-depth understanding on the principles and mechanisms of inheritance
- Learns about the fine structure and molecular aspects of genetic material
- Acquires knowledge about the importance of inheritance in Man
- Gets an awareness about emerging field of bioinformatics and equip them to take up bioinformatics studies

Course: Developmental Biology

Course outcome

- Learns about the concepts and process in developmental biology
- Understands and appreciates the genetic mechanisms and the unfolding of the same during development
- Becomes aware of the new developments in embryology and its relevance to Man
- Gains knowledge about the teratogenic agents and its impact on development.

Course: Biophysics, Instrumentation And Biological Techniques

Course outcome

- Learns the biophysical properties and functioning of life processes
- Awaereness about tools and techniques available for studying biochemical and biophysical nature of life
- Hands on training on the use of tools and techniques for project work/ research in biology

SEMESTER 3

Course: Animal Physiology

Course outcome

- Compares the functioning of organ systems across the animal world
- Acquire a broad understanding of the hormonal regulation of physiological processes in invertebrates and vertebrates.
- Develop a basic understanding of the experimental methods and designs that can be used for further study and research.
- Understanding of the various disorders in animals and their causes
- Gets thorough knowledge about human physiology

- Learns to design experimental projects in physiology

Course: Cell and Molecular Biology Course outcome

- Gains knowledge on the structural and functional details of the basic unit of life at the molecular level
- Motivate the learner to refresh and delve into the basics of cell biology
- Introduce the new developments in molecular biology and its implications in human welfare

Course: Microbiology and Biotechnology

Course outcome

- Provides an over view of the microbial world, its structure and function
- Familiarizes the learner with the applied aspects of microbiology
- Gives an intensive and in-depth learning in the field of biotechnology
- Understands the modern biotechnology practices and approaches with an emphasis in technology application, medical, industrial, environmental and agricultural areas
- Familiarize the students with public policy, biosafety, and intellectual property rights issues related to biotechnology

Course: Immunology

Course outcome

- Provides an intensive and in-depth knowledge to the students in immunology
- Helps the learner to understand the role of immunology in human health and well-being
- Familiarizes the students the new developments in immunology

SEMESTER 4

Course: ELECTIVE C: Environmental Science

Course outcome

- Provides a broad and deep understanding on environment and influence of man on environment
- Equips the students to use various tools and techniques for the study of environment
- Enables the learner to understand, think and evolve strategies for management and conservation of environment for sustaining life on earth
- Motivates the learner to take up further studies and research in the field

Course: Environmental Science: Concepts And Approaches

Course outcome

- Gives a clear understanding on the basic concepts of environmental biology
- Prepares the learner to participate in environment conservation programmes
- Gives an understanding of the International and national level programme related to environment protection

Course: Environmental Pollution and Toxicology

Course outcome

- Acquires knowledge about the environmental issues
- Provides an opportunity to participate in field activities and get first hand information about environmental issues.
- Motivates the learner to participate in environment protection programmes

Course: Environmental Management and Development

Course outcome

- Acquires knowledge about the steps in environment management.
- Gains information about the tools and techniques related to environment management
- Provides information about various environment management programmes
- Helps the learner to participate in environmental managements programmes.

B.Sc. Botany

PROGRAM OUTCOMES

By the end of B Sc program in Botany, a student will:

1. Acquire basic knowledge of various branches of Botany
2. Inculcate interest and love of nature with its myriad life forms
3. Acquire basic skills in the observation and study of nature
4. Be exposed to the diversity among life forms and understand the unity behind diversity
5. Be aware of the ecological and evolutionary significance of the various life forms in the environment
6. Learn the different biological techniques.
7. Develop a scientific attitude which make her open minded, critical and curious
8. Develop ability for the application of the acquired knowledge in life and become self reliant and self sufficient
9. Develop an ability to work on their own and to make them fit for the society
10. Aquire awareness of the conservation of the biosphere.

11. Develop skill in practical work, experiments, equipments and laboratory use along with collection and interpretation of biological materials and data
12. Acquire the ability to engage in independent and self learning.
13. Be aware of natural resources and environment and the importance of conserving it.
14. Be able to communicate effectively their views and ideas on different issues related to biology
15. Be equipped to use computers in data acquisition and processing and use available software as a tool in data analysis.
16. Appreciate and apply ethical principles to biological science research and studies
17. Successfully pursue their career objectives in advanced education, professional courses, scientific career, teaching career in the school systems or related career following graduation.

PROGRAMME SPECIFIC OUTCOMES

The graduate of this programme will be able to:

1. Know the importance and scope of the discipline
2. Acquire a firm foundation in every aspect of Botany
3. Have an understanding of the broad spectrum of modern trends in Botany
4. Do lifelong learning due to attention drawn to the world of plants and introduction to the methodology of systematic academic enquiry
5. Scientifically identify and list out plants in their locality
6. Identify the role of different plants and their mode of survival in the environment
7. Develop skills to cultivate the economically beneficial plants and thus open opportunity for self employment
8. Develop love and respect for nature
9. Analyze the impact of deforestation on environment
10. Explain the role and impact of different environmental conservation programme
11. Become an ambassador of sustainable development of our country
12. Understand the importance of modern branches of science like Biotechnology for the economical benefits of agriculture
13. Use tools of information technology for all activities related to Botany

Semester 1

Course: Methodology and Perspectives of Science & An Introduction to the World of Plant Diversity

Course Outcomes

- Learn scientific methods, culture and work habits
- Awareness on role of research in science

- Awareness of the basic philosophy of science, its history, concepts and scope
- Develop Basic knowledge on the living world and especially plant kingdom
- Understand the diversity and underlying unity in plant world

Semester 2

Course: General Informatics and Methodologies in Plant Sciences

Course Outcomes

- Familiarizewith the use of computers
- Learn to use information technology for learning purpose
- Familiarize with the basic tools and techniques of scientific study with emphasis on biological sciences
- Learn the different bio statistics techniques and their use in different purposes
- Get an idea on research methodology

Semester 3

Course: MICROBIOLOGY AND PHYCOLOGY

Course Outcomes

- Understand the world of microbes
- Have an idea on diverse groups of plants
- Understand the identifying characters of the lower groups of plants
- Awareness of the various ecological roles of lower forms of plants
- Understand the application of microbiology in different fields.

Semester 4

Course: ANATOMY AND REPRODUCTIVE BOTANY OF ANGIOSPERMS

Course Outcomes

- Imparts an insight into the internal structure and reproduction of the most evolved group of plants, the Angiosperm.
- Identifies role of anatomy in solving taxonomic and phylogenetic problems.
- Understand the structural adaptations in plants growing in different environments.
- Learn the life cycle pattern of Angiosperms.
- Understand the morphology and development of reproductive parts.
- Get an insight in to the fruit and seed development

Semester 5

Course: MYCOLOGY, LICHENOLOGY AND PLANT PATHOLOGY

Course Outcomes

- Understand the diversity of fungal and lichen world and its significance.
- Awareness of the various plant diseases and their impact on agriculture.
- Familiarize with the various measures adopted to control plant diseases

Course: ENVIRONMENTAL SCIENCE AND ECOTOURISM

Course Outcomes

- Awareness of the significance of Environmental Science.
- Understand the extent, limitations and depletion of natural resources
- Learns about the need of sustainable utilization of natural resources.
- Understand the structure and function of the Ecosystems and the nature and interactions of populations in the ecosystem
- Understand various kinds of pollution in the environment, their impacts on the ecosystem and their control measures
- Learn the various environmental laws in India
- Awareness about the role of various movements in the protection of nature and natural resources.
- Understanding the extent of the total biodiversity and their conservation.
- Can assess the positive and negative impacts of Ecotourism and its role in the sustainable utilization of resources for tourism.

Course: GENETICS, PLANT BREEDING AND HORTICULTURE

Course Outcomes

- Understand the basic principles of heredity
- Understand the inheritance pattern of nuclear and extra nuclear genes
- Understand the methods of crop improvement
- Understand the importance of horticulture in human welfare

Course: CELL MOLECULAR BIOLOGY AND EVOLUTION

Course Outcomes

- Understand the Ultra structure and functioning of cell in the submicroscopic and molecular level.
- Get an idea of origin, concept of continuity and complexity of life activities.
- Familiarization of life process.
- Understand the basic and scientific aspect of diversity.
- Learn the cytological aspects of growth and development.
- Awareness DNA as the basis of heredity and variation.
- Understand the concept of evolution as the basis of biodiversity

Semester 6

Course: PLANT PHYSIOLOGY AND BIOCHEMISTRY

Course Outcomes

- Understand the basic principles related to various physiological functions in plant life.
- Familiarize with the basic skills and techniques related to plant physiology.
- Understand the role, structure and importance of the bio molecules associated with plant life.
- Familiarize with the recent trends in the field of plant physiology.
- Awareness of applied aspects of plant physiology in fields like agriculture.

Course: BRYOLOGY, PTERIDOLOGY, GYMNOSPERMS &PALEOBOTANY

Course Outcomes

- Understand the diversity in habits, habitats and organization of various groups of plants.
- Understand the evolutionary trends in plants.
- Identify the anatomical variations in lower groups of plants.
- Understand the significance of Paleobotany.

Course :

ANGIOSPERM MORPHOLOGY, SYSTEMATIC BOTANY AND ECONOMIC BOTANY

Course Outcomes

- Acquaint with the aims, objectives and significance of taxonomy.
- Identify the common species of plants growing in Kerala and their systematic position.
- Develop inductive and deductive reasoning ability.
- Acquaint with the basic technique in the preparation of herbarium.
- Familiarizing with the plants having immense economic importance.

Course: BIOTECHNOLOGY AND BIOINFORMATICS

Course Outcomes

- Familiarize with the fundamental principles of biotechnology, various developments in biotechnology and potential applications.
- Awareness about the wise use of life forms for human advancement.
- Get an introductory knowledge about bioinformatics
- Usage of computers to handle biological data base.

B.VOC. PROGRAMME IN SPORTS NUTRITION AND PHYSIOTHERAPY

Programme Outcomes

- By the end of B.Voc Program in Sports Nutrition and Physiotherapy a student will
- Be able to train and develop professionals with expertise in fitness and nutrition management for services in Hospitals, Wellness Centres and Sports Academics.
- Be able to develop capabilities to provide preventive, promote and therapeutic care in health and diseases
- Familiarize with basic concepts nutrient requirements and meal planning throughout the life cycle
- Understand the integrated functions of all systems and the grounding of nutritional Science in Physiology.
- Understand the scientific background of exercise and sporting activities
- Be able to enable the students understand the role of exercise in fitness.
- Utilize knowledge of biomechanics
- Enable sportsmen/athletes and individuals who exercise to use optimum energy to maximize performance under normal and stressed conditions while minimizing injury
- Develop professional expertise in weight management, rehabilitation and fitness
- Understand the psychological problems during extreme physical and mental stress
- Be enable the students understand the therapeutic benefits of exercise.
- Be able to gain the knowledge and understanding of nutrition required for exercise and sport in order to enhance performance.
- Be able to impart knowledge on the physiological effects of exercise on human body composition
- Be able to acquire adequate knowledge of the basic medical subjects in the practice of physiotherapy.
- Develop skills and competence in evaluation of patients, planning of management and carry out the various modalities and techniques in the physiotherapeutic
- Management of the various medical and surgical conditions.
- Develop proper attitudes of compassion and concern for the welfare of the Individual patient as well as for the welfare of the physically handicapped in the community.
- Maintain proper moral and ethical standards towards patients and other professional colleagues in the practice of physiotherapy.

SEMESTER I

- **English –I Communication Skills in English**
- **Programme Outcomes**
- English has been gaining grounds in global communication .Excellent communication skills enhance student's employability. Because of the increasing importance of English, the universities offer

courses in communication skills in English. It aims to develop student's ability to use English accurately, appropriately and fluently.

Course Outcomes

- Part l familiarizes students with the sounds of English and their symbols
- Part ll attempts to familiarise students with the barriers to listening and to develop their ability to listen to face –to-face and telephone conversations, public announcements
- Part lll attempt to improve students spoken English
- PartIV. Introduce learners to the strategies of academic reading such as scanning, surveying, predicting and making inferences.

Basic Nutrition

Course Outcomes

- As a course , students be able to:
- Acquires the basic knowledge about food and nutrition.
- Understand digestion of food, five food groups and food pyramid.
- Explain energy metabolism and BMR.
- Describe classification, digestion, absorption and metabolism of carbohydrates, proteins and lipids.
- Classify the vitamins, deficiency and daily requirements.
- Explain minerals and functions of water

Program Specific Outcomes

- Upon completion of this course, students should be able to:
- Explain Food, nutrition, Health, Nutrients, optimum nutrition, nutritional status, good nutritional status, poor nutritional status, malnutrition, under nutrition, signs of good nutritional status, signs of poor nutritional status.
- Describe five food groups, dietary guidelines and food pyramid.
- Calculate energy value of food- calorimetry or bi proximate composition; energy needs of the body- reference man and reference woman and basal metabolic rate.
- Advice recommended dietary intake and sources of carbohydrates, lipids and proteins also the role of dietary fiber in prevention and treatment of diseases.
- Explain Deficiency of following minerals: calcium, sodium, potassium, iron and iodine.
- Advice daily intake of water, daily loss of water, body water, water balance, deficiency of water, retention of water, daily requirements.

Human Anatomy

Course Outcomes

- As a course , students be able to:
- Study the basic tissues of the body.

- Understand embryology: Ovum, Spermatozoa, fertilization and formation of the Germ layers and their derivations. Development of skin, Fascia, blood vessels, lymphatic. Development of bones axial and appendicular skeleton and muscles. Neural tube, brain vessels and spinal cord and Development of brain and brain stem structures.
- Understand the regional anatomy of cardiovascular system, respiratory system, abdomen, pelvis and endocrine system.
- To study musculoskeletal anatomy including osteology, soft parts, joints of upper extremity, lower extremity, trunk, pelvis, head and neck.
- Understand the Neuro Anatomy including Organization of Central Nervous system, Spinal nerves and autonomic nervous system, Cranial nerves, Peripheral nervous system and Central Nervous System.

Program Specific Outcomes

- Upon completion of this course, students should be able to:
- Explain the histology and microscopic structure of cell and its components.
- Describe development of bones, axial and appendicle skeleton and muscles. Neural tube, brain vessels and spinal cord development of brain and brain stem structures.
- To explain the functions of cardio vascular system and respiratory system.
- Demonstration of the muscles of the whole body and organs in thorax and abdomen.
- Demonstration of movements in important joints
- Explain Surface marking of the lung, pleura, fissures and lobes of lungs, heart, liver, spleen, Kidney, cranial nerves, spinal nerves and important blood vessels.
- Identify the bony prominences on inspection and by palpation especially of extremities
- Demonstrate the points of palpation of nerves and arteries.
- Explain Central Nervous System including Spinal cord, Spinal segments and areas, Brain Stem, Cerebellum, Thalamus, Hypothalamus, Corpus striatum, Cerebral hemisphere, Lateral ventricles, Blood supply to brain, Basal Ganglia, The Pyramidal system, Pons, medulla, extra pyramidal systems, Anatomical integration.

Human Physiology

Course Outcome

- CO1.Describe the cell morphology and functions.
- CO2.Explain the composition and functions of plasma proteins, RBC, WBC, Platelets, lymph and plasma.
- CO3.Describe the cardiac muscles and conducting system of heart, regulation of blood pressure, heart rate and cardiac output

- CO4.Write down the mechanics of breathing, spirometry, pulmonary circulation, regulation of respiration.
- CO5.Explain the composition, functions and regulation of salivary secretion, gastric juice, pancreatic secretion, succus entericus.
- CO6.Describe the functions and regulation of major
- Glands and its hormones
- CO7.Identify the male and female reproductive system.
- CO8.Explain about special senses like vision, audition, smell, taste etc
- CO9.Differenciate the sensory and motor mechanism, reflex action, spinal cord lesions

SEMESTER II

English-Critical thinking, Academic writing & presentation

Programme outcome

- The book is designed to help students think critically, develop skills in academic writing and how their ability to make presentation.
- It aims to enable students acquire expertise in the skills that will empower them not only for academic & professional success but also enable them to communicate effectively in their personal lives.

Course out come

- Critical thinking is a disciplined intellectual process that helps to skillfully analyze and evaluate information.
- Academic writing includes students' assignment, research papers, seminars and project reports build upon the foundation laid by critical thinking.
- The chapter presentation skills give students practical advice on planning their presentation, organizing their material and using audio-visual tools to communicate effectively with their audience
- SPT2G1- Information Technology and IT Tools
- The course is to enable a student to acquire the knowledge pertaining to fundamentals of Information Technology and IT Tools (Operating System - MS Windows, DOS & Linux, Basics of MS Office -Word Processing, Spreadsheet & Presentation, learning the Internet and Project Work).
- This Course consists of five modules. Practical assignments have been worked out for each theory module.
- At the end of the course the students will be able to:-
- Acquire the foundation level knowledge required to understand computer and its operations.
- Understand the hardware and software components of the computer.

- Understand the basic concept of operating system and get knowledge about various different operating systems.
- Understand to use the packages of word processing, spreadsheet and presentation in detail.
- Basic concepts in PageMaker.
- Review the current topics in Internet technologies.
- Learn the basic working scheme of the Internet and World Wide Web.

Clinical Orthopedics & Sports Medicine -I

Course Outcomes

- As a course , students be able to:
- Introduction to orthopedics. Clinical examination in an Orthopedic patient. Common investigative procedures.
- Study the Fractures and dislocations of upper Limb, Fracture of Spine and Fractures and Dislocations of Lower Limb.
- Describe soft tissue injuries such as strains, sprains and contusion and their management.
- Study hand injuries, crush injuries, burns and their management.
- Explain traumatic spinal cord injuries.

Program Specific Outcomes

- Upon completion of this course, students should be able to:
- Explain clinical examination in an Orthopaedic patient and to give first aid and advice investigative procedures.
- Understand the signs and symptoms and give the first aid in fractures.
- Give the primary treatment for soft tissue injuries and sports injuries.
- Demonstrate the first aid in spinal cord injury and burns.
- (ADD CLINICAL 2)

Sports and Exercise Therapy

Course Outcomes

- As a course , students be able to
- CO1Describe the aims and techniques of exercise therapy, starting and fundamental positions.
- CO2.Explain the techniques of functional tests, manual muscle testing, test for co ordination, sensation, pulmonary function test etc
- CO3.Differenciate the types and techniques of passive and active movements
- CO4.Demonstrate proprioceptive neuromuscular facilitation
- CO5.Describe the indications, contraindications and techniques of suspension therapy, stretching maneuver, peripheral joint mobilization techniques
- CO6. Explain various balance regaining techniques

- CO7.Different types of postures
- CO8.Demonstrate various waiking aids and its gait training
- CO9.Describe hydrotherapy and group exercise

ORIENTATION TO SPORTS PHYSIOTHERAPY

- **Program outcome**
- Ability to communicate clearly and effectively, orally and in writing, to the users of the healthcare system, as well as to other healthcare professionals.
- Ability to work in professional teams and in collaboration with staff from professional healthcare organizations that are structured as basic or multidisciplinary units.
- Ability to apply ethical and legal principles to the practice of the profession.
- Command of spoken and written language.
- Respect for the fundamental rights of equality between men and women, the promotion of human rights and values of a culture of peace and democratic values.
- **Course outcomes**
- To know and understand the morphology, physiology, pathology and behavior of healthy and ill people in natural and social environments.
- To know and understand the science, methods, techniques and instruments on which physiotherapy is based.
- To know and understand the methods, procedures and actions expected in clinical contexts, as well as to employ physiotherapy as an educational tool for promoting and maintaining health.
- To acquire clinical experience to build up intellectual abilities and manual skills, embrace ethical and professional values, and develop the ability to apply the knowledge acquired on the course for its application to specific clinical cases in hospital environments, or in primary and community and healthcare.
- To assess the functional status of patients based on their physical, psychological and social needs.
- To administer physiotherapeutic diagnostic care based on internationally recognised standards.
- To design physiotherapy intervention plans based on criteria of suitability, efficiency and validity.
- To run, mange and coordinate physiotherapy intervention plans using the therapeutic tools available.
- To assess the evolution of the results obtained with regard to treatment targets.
- To prepare physiotherapy healthcare reports at the end of treatments.
- To provide effective physiotherapeutic and comprehensive healthcare to patients.
- To participate in the areas of the promotion, prevention, protection and recovery of health.
- To participate in the growth and expansion of physiotherapy protocols based on scientific evidence that promotes research in physiotherapy.

- To perform physiotherapy interventions based on comprehensive healthcare that involves multi-professional cooperation, the integration of processes and continuity of care. To understand the importance of upgrading knowledge, skills and attitudes those are inherent to professional physiotherapists.
- To acquire clinical management skills, such as the efficient use of healthcare resources, development planning, the management and control of healthcare units in which physiotherapy plays a central role and its relationship with other health services.

SEMESTER III

- **Therapeutic Nutrition**
- **Course outcome**
- The students become able to:
- Know about the role of dietition
- Differentiate the different types and metabolic changes of fever and the necessary modification in diet for a fever patient
- Provide dietary advice for patients suffering from peptic ulcer
- Familiarize the role of diet in cardio-vascular diseases and give diet counseling for cardiac patients.
- Know about different types of diabetes and give advice about diet modification for diabetic patients
- Familiarize the role of diet in reducing body weight.
- Know about the role of diet in kidney diseases and the procedure of dialysis

Electrotherapy

- **Course Outcomes**
- As a course , students be able to:
- Explain basic Physics related to electrotherapy
- Study low frequency currents such as galvanic and faradic current.
- Explain types of electrode, size & placement of electrodes used in electrotherapy, basic mechanisms in human body when current flow in tissues.
- Study TENS and medium frequency currents.
- Study high frequency current modalities - SWD, Ultrasound , Laser and superficial heating modalities.

Program Specific Outcome

- Upon completion of this course, students should be able to:
- Demonstrate the technique for patient evaluation, receiving the patient and positioning the patient for treatment using electrotherapy.
- Collection of materials required for treatment using electrotherapy modalities and testing of the apparatus.

- Demonstrate placement of electrodes for various electrotherapy modalities and Electrical stimulation for the muscles supplied by the peripheral nerves.
- Give Faradism under pressure for UL and LL and plotting of SD curve with chronaxie, rheobase and demonstrate FG test.
- Demonstrate treatment techniques using SWD, IRR,IFT and Ultrasound for different regions.
- Calculate of dosage and technique of application of LASER.
- Demonstrate the Technique of treatment and application of Hydro collator packs, cryotherapy, contrast bath, wax therapy and whirl pool bath.
- Demonstrate winding up procedure after any electrotherapy treatment method.
- Physiology of sports and exercise

Program outcome

- Understanding human anatomy and physiology.
- Understanding the relation of nutrients for athletic and non-athletic population.
- Understanding of kinesthetic movement and the physiological effects of exercise. (Body Movement)
- Recognizing and understanding the mental & physical domains of injury prevention and care.
- Able to manage, communicate, and network effectively within various health and exercise settings.

Course outcome

- Develop a comprehensive periodic exercise program based on energy and sport demands.
- Understanding risk management and liability within the athletic environment.
- Practically apply the acquisition of knowledge in a professional setting.

SCIENTIFIC PRINCIPLES AND PRACTICES OF HEALTH AND FITNESS TRAINING

- **Program outcomes**
- Students will understand the importance of sound health and fitness principles as they relate to better health and will be able to:
- Define the various health components of fitness.
- Recognize the physical and mental benefits of increased activity.
- Understand anatomy, basic bio mechanical principles and terminology.
- Determine factors involved with development, fitness levels and training strategies.
- Examine the effect of nutrition, rest and other lifestyle factors that contribute to better health.
- Course outcomes
- Students will be exposed to a variety of activities providing them the opportunity to:
- Apply learned fundamental skills.
- Utilize physical activity as a tool to manage stress.
- Empower themselves by setting and working toward realistic individual goals.

- Participate in a motivating and nurturing environment resulting in a greater sense of well-being and self-esteem.
- Participate in active learning to stimulate continued inquiry about physical education, health and fitness.
- Students will demonstrate proficiency through knowledge and acquired skills enabling them to:
- Understand and utilize various training methods.
- Assess individual levels of fitness components.
- Create a safe, progressive, methodical and efficient activity based plan to enhance improvement and minimize risk of injury.
- Identify common health and fitness myths along with trends involved with the evolving nature of physical education.
- Develop an appreciation of physical activity as a lifetime pursuit and a means to better health.
- First Aid and Nursing
- As a course , students be able to :
- CO1.Explain the importance of first aid in physiotherapy
- CO2.Examine vital signs such as blood pressure, temperature, pulse and respiratory rate
- CO3.Demonstrate first aid in cardiac arrest, respiratory failure, burns, electric shock, drowing,spinal cord injuries ,poisoning, road traffic accident etc
- CO4.Explain assessment and technique of CPR
- CO5. Understand the interpersonal relationship and nursing principles.
- CO6.Demonstrate various lifting and transporting techniques
- CO7.Describethe various methods of giving nourishment like feeding, tube feeding, IV fluids, blood transfusion
- CO8.Explain various aseptic techniques- sterilisation and disinfection.
- CO9.Observe surgical dressing.

SEMESTER-IV

- **Physiotherapy in Orthopaedics & Sports Medicine**
- **Course Outcomes**
- After completion of the course students be able to :
- CO1.Take detailed assessment of Orthopaedic conditions
- CO2.Explain the types,classification,signs and symptoms ,complications of different fractures.
- CO3.Identify various fracture management techniques such as reduction,immobilization, Traction,cast bracing etc.
- CO4. Understand the complications of fracture and its management

- CO5.Demonstrate the P.T.management of various degenerative conditions like osteoarthritis,rheumatoid artriis,ankylosing spond ylosis,gout ,perthes disease.
- CO6.Explain the clinical features ,surgical ,medical and PT.management of infective conditions such as osteomyelitis, pyogenic arthritis, and TB spine.
- CO7.Manage spinal conditions cervical spondylosis, spinal canal stenosis,sacro-iliac dysfunction, sacralisation
- CO8.Explain the effects of spinal traction
- CO9. Describe orthopaedic surgeries such as arthoplasty, arthodesis, spinal fusion, soft tissue release, tendon transplant, osteotomy and its PT Management
- CO10.Explain bio-engineering-Classification of Orthoses and prostheses; biomechanical principles of orthotic and prosthetic application; Designing of upper extremity, lower extremity and spinal orthosis, indications and check out; Designing of upper extremity and l lower extremity prostheses, indications and check out
- CO11.Introduce sports physiotherapy which includes stages of soft tissue healing.General and PT management of rotator cuff injuries,meniscal injuries,dequervains tenosynovitis,trigger finger ,wrist sprains
- Sports psychology and counselling

Program outcome

- This program introduce fundamental principles involved in research and practice within Sports Psychology. The primary outcome is the facilitation and the understanding of how psychological factors influence involvement and performance in sport and exercise settings. The program explores such topics as personality, competition and leadership, motivation, and group cohesion and dynamics in sport and exercise.

Course outcome

- Students who successfully complete this course will be able to
  1. Critically evaluate psychology theory and research findings relevant to sport psychology.
  2. Explain key concepts and theories from a number of content areas including personality, motivation, anxiety/arousal, community engagement, groups and teams.
  3. Apply theoretical perspectives from sport psychology in real world contexts.
  4. Critique research methodologies used within sport psychology, and develop an awareness of Researchethics.
  5. Integrate information from various sources concerning topics and problems related to sport psychology, and communicate the results of these investigations in a logical and clear manner.
  6. Demonstrate an increased understanding of your own behavior, mental processes and experiences and the behavior of others.

SEMESTER-V

- **Biomechanics**
- ## Course Outcomes
- As a course , students be able to:
- Understand the basic concepts in Biomechanics: Kinematics and Kinetics
- Understand the joint and muscle structure and function and its effects in injury and aging.
- Study Biomechanics of vertebral column , thorax and chest wall including ventilatory motions.
- Explain the biomechanical structure and function of Tempero mandibular Joint and peripheral joints and effects of injury and aging.
- Study the posture and gait its kinematics and kinetics.
- **Program Specific Outcome**
- Upon completion of this course, students should be able to:
- Acquires the basic knowledge of Kinetics and kinematics including type , location, direction and magnitude of motion.
- Familiarize the Joint design, Materials used in human joints , Mobility and stability functions of muscles, Elements of muscle structure, Muscle function,
- Effects of immobilization, injury and aging
- Apply the knowledge of biomechanics of different joints immobilization , injury, aging and different conditions.
- Analyze the different posture and gait on age, pregnancy, occupation and recreation and injury.
- Find the asymmetries in gait, mal alignments in gait , and activities of daily living like sitting to standing, lifting, various grips, pinches.
- Physiotherapy in General Medicine & Surgery Including Cardiothoracic Conditions

Course Outcomes

- As a course, students be able to:
- Study Anatomical and physiological differences between the Adult and Pediatric lung , bedside assessment of the patient-Adult & Pediatric and the investigations and tests in cardiology.
- Study Physiotherapy techniques to increase lung volume, to decrease the work of breathing and to clear secretions and drugs used in cardiology.
- Explain Physiotherapeutic management in dermatology conditions such as wound ulcers.
- Study Physiotherapy in Obstructive lung conditions, Restrictive lung conditions and Neonatal and Pediatric Physiotherapy.
- Program Specific Outcome
- Upon completion of this course, students should be able to:
- Take bedside assessment of adult and paediatric patients in cardiology

- Apply Physiotherapy techniques to increase lung volume- controlled mobilization, positioning and breathing exercises, techniques to decrease the work of breathing.
- Demonstrate techniques to clear secretions-Hydration, Humidification & Nebulisation Mobilisation and Breathing exercises, Postural Drainage, Manual techniques - Percussion, Vibration and Shaking, Rib Springing, ACBT Autogenic Drainage, Mechanical Aid - PEP, Flutter, IPPB, Facilitation of Cough and Huff Nasopharyngeal Suctioning.
- Apply Electrotherapeutics measure for dermatological conditions such as wound and scars .
- Give Physiotherapy in Obstructive lung conditions, Restrictive lung conditions, Management of breathlessness, paediatric and neonatal physiotherapy.

  (ADD PT CHEST 2)
- Physiotherapy in Neurology and Neurosurgery

Course Outcomes

- As a course , students be able to:
- CO 1.

  Take detailed neurological Assessment which includes chief complaints.

  History taking , Observation, Palpation, Higher mental function - Motor Examination , Reflexes, Special tests - Romberg's Kernig's sign, Brudenzki sign, Tinels's sign, Slum test, Lehdrmitte's sign. Bells Phenomenon. Gower's sign, Sun set sign, Balance examination, coordination examination, Gait analysis - Kinetics & Kinematics,Functional Analysis, Assessment tools & Scales- Reflex Grading, Differential diagnosis.
- CO2.

  Explain Neuro physiological Techniques and its application
- CO3.

  Take Paediatric Examination which include Developmental milestones, developmental reflexes, Neuro developmental screening tests. Balance & Coordination examination, Gait analysis, Functional analysis and Management of Risk babies, minimum brain damage, Developmental disorders, Cerebral palsy,Autism, Down's Syndrome, Hydrocephalus, Chorea, Spina bifida and Syringomyelia
- CO4.

  Evaluation and Management of Brain and Spinal Cord Disorders such as

  Cerebrovascular Accident, Meningitis, Encephalitis, Head Injury, Brain Tumors, Perceptual disorders
- CO5.

  Do Evaluation and Management of Cerebellar Spinal Cord and Muscle Disorders like Sensory Ataxia, Parkinson's disease, Muscular dystrophy, Myasthenia Gravis, Eaton-Lambert Syndrome,

spinal tumors, Spinal cord injury,Transvers myelitis, Bladder & Bowel Dysfunction, Spinal muscular atrophies, Poliomyelitis

- CO6.

  Describe Evaluation and Management of Peripheral Nerve Injuries and Disorders such as Guillain-Barre syndrome, Brachial plexus palsy, Thoracic outlet syndrome. Lumbosacral plexus lesions, Phrenic &intercostals nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy,Musculocutaneous nerve palsy, Anterior & Posterior interosseous nerve palsy, Axillary nerve palsy, Long thoracic nerve palsy, Suprascapular nerve palsy, sciatic nerve palsy.

- CO7.

  Take the Assessment and Management of Neurological gaits -Hemiplegic gait, Parkinson gait,High step gait, Hyperkinetic gait, Hypokinetic gait, Waddling gait, Scissoring gait

- CO8.

  Explain the Pre and Post surgical assessment and treatment - Spinal disc herniation, Spinal stenosis, Spinal cord trauma, Head trauma, Brain tumors, Tumors of the spine, Spinal cord and peripheral nerves, Cerebral aneurysms, Subarachnoid haemorrhages, epilepsy, Parkinson's disease. Chorea, Haemiballism, Psychiatric disorders, Malformations of The nervous system, Carotid artery stenosis, and Arteriovenous malformations Apply Yoga in various neurological conditions

WEIGHT MANAGEMENT, REHABILITATION AND FITNESS

Program outcomes

- Describe the current prevalence of overweight and obesity.
- Identify risk factors and diseases associated with overweight/obesity.
- Identify genetic biologic, and environmental contributors to weight status.
- Define body mass index and waist circumference, and identify indications for use.
- Define and distinguish among healthy weight, overweight, and obesity.
- Distinguish among key methods used to measure body composition.
- Recognize current evidence-based recommendations for assessment and treatment of weight management ADA Adult Weight Management Evidence-Based Nutrition Practice Guidelines, and the 2013 new AHA/ACC/TOS Guidelines for the Management of Overweight and Obesity in Adults.
- Be aware of techniques (and their limitations) used to assess dietary intake in overweight and obesity.
- Identify behavioral predictors of successful weight maintenance based on outcomes of the National Weight Control Registry.

Course outcomes

After completing the course, student will be able to:

- Describe the current prevalence of overweight and obesity.
- Identify risk factors and diseases associated with overweight/obesity.
- Identify genetic, biologic, and environmental contributors to weight status.
- Define body mass index and waist circumference, and identify indications for use.
- Define and distinguish among healthy weight, overweight, and obesity.
- Distinguish among key methods used to measure body composition.
- Recognize current evidence-based recommendations for assessment and treatment of weight management ADA Adult Weight Management Evidence-Based Nutrition Practice Guidelines, and the 2013 new AHA/ACC/TOS Guidelines for the Management of Overweight and Obesity in Adults.
- Be aware of techniques (and their limitations) used to assess dietary intake in overweight and obesity.

  Identify behavioral predictors of successful weight maintenance based on outcomes of the National Weight Control Registry.
- Recognize current research evaluating the efficacy of leading popular diets and diet approaches for weight management.
- Identify the components of Metabolic Syndrome (Syndrome X) and its relation to obesity.
- Describe and begin to apply counseling skills important to successful client weight management.
- Be aware of emerging research, issues and non-traditional approaches to weight management.
- List the current public health guidelines for moderate and vigorous physical activity for adults.
- Distinguish between the amount and type of physical activity recommended for general health benefits and for weight management.

Evidence based physiotherapy

Program outcome

- Identify the major components of the EBP process.
- Produce current state process map.
- Develop clinical question(s) using PICO format.
- Search databases for evidence.
- Critically analyze research articles using hierarchy of evidence.
- Analyze stakeholder engagement.
- Determine appropriate metrics to evaluate the effectiveness of EBP implementation.

- Identify barriers to success.
- Develop countermeasures and implementation plan.
- Synthesize collected evidence to develop clinical decision support tools or hospital policy, and a written EBP summary.

Course outcome

- This course is designed to teach evidence-based practice (EBP) skills that will enable staff to conduct extensive evaluations of existing literature to improve patient care.
- The program provides a comprehensive overview of EBP, and the components essential for implementation of EBP in a clinical setting.
- It is designed to focus on skills needed to critically evaluate new information available from research findings and professional consensus statements.
- Essential tools for clinical inquiry are addressed, including: developing PICO (Patient, Intervention, Comparison, Outcome) questions, exploring levels of evidence, evaluating existing clinical guidelines, and critically analyzing and appraising research articles.
- The course provides important knowledge for integrating evidence into policies, procedures and clinical decision support tools (i.e., order sets, BPAs, flow sheets) and summaries that provide support for excellence in clinical practice.

MEDICAL INSTRUMENTATION

PROGRAM OUTCOME

- This course covers the basic and advanced principles, concepts, and operations of medical sensors and devices.
- The origin and nature of measurable physiological signals are studied, including chemical, electrochemical, optical and electromagnetic signals.
- The principles and devices to make the measurements, including design and experimentations, will be rigorously presented.
- Understanding the basic principles and phenomena in the area of medical diagnostic instrumentation
- Understand how signals are converted from analogue to digital and stored in a computer
- Review the cardiac, respiratory and muscular physiological systems. Integrate information's learned about biomedical signals and instrumentation design.

COURSE OUTCOME

On successful completion of this course, student should be able to

- Define basic medical terms and physical values that can be handled by medical instrumentation.

- Describe methods and implementation of electrical and non electrical medical parameters.
- Demonstrate measuring of basic medical parameters.
- Calculate basic parameters of the equipments for using electro diagnostic and electrotherapy.
- Recommended problem solving and service procedures for electrical equipment.

Apply safety standards and select disposal methods and procedures for electrical diagnostic equipment

- **M.A. Political Science**

- **Programme Outcome –Post Graduate programme in Political Science**
- Comprehend the basic structures and processes of government systems and theoretical underpinnings.
- Analyze political problems, arguments, information, and theories.
- Apply methods appropriate for accumulating and interpreting data applicable to the discipline of political science.

COURSE OUTCOMES

I SEMESTER

PS –S1-CO1 POLITICAL THOUGHT: ANCIENT AND MEDIEVAL TRADITIONS

- Students can understand and get familiarise with the political philosophies and traditions of various times.
- They can easily analyse the underlying philosophical elements beneath political realities.

PS –S1-CO2 PUBLIC ADMINISTRATION: THEORY & CONCEPTS

- Students get an idea about the theoretical aspects of Administration. Familiarise with concepts such as e – Governance , Good Governance, etc.
- This course enables the students to understand the pre – requisites for effective and just administration at various levels.

PS –S1-CO3 INDIA: STATE, POLITY AND GOVERNANCE

- Students understand the philosophical and practical dimensions of the Indian Constitution clearly, which helps them to build up an analytical mind that practically realise the working capacities of Indian polity.

PS –S1-CO4 POLITICAL THEORY

- The theoretical basis of political science as a discipline is broadly communicated.
- It provides the students with a clear knowledge of different theoretical aspects of the subject.

PS –S1-CO5 THEORY AND PRACTICE OF INTERNATIONAL RELATIONS

- It introduces the students to various theoretical traditions in International Relations and helps the students to understand the state of the art of International Relations.

II SEMESTER

PS –S2-CO6 POLITICAL THOUGHT: MODERN TRADITIONS

- The course offers different traditions of modern political philosophy to create analytical skills in students in understanding various concepts, theories, categories and ideologies in the contemporary period.

PS –S2-CO7 INDIAN ADMINISTRATION

- Students can understand perspectives on Indian administration in a broader framework of India's long historical and political experiences.
- Also contemporary issues such as decentralisation, governance and transparency in administration are included for better learning experience.

PS –S2-CO8 ISSUES IN INDIAN POLITICS

- Students are sensitised about various contending factions working within Indian framework and challenges faced by Indian Union and the necessity to overcome these threats by inculcating civic values and patriotism.
- The thrust of the course will be on the contemporary social and political forces, practices and historical underpinnings.

PS-S2-CO9 ISSUES IN INTERNATIONAL RELATIONS

- The course provides themes in International Relations to develop critical insights on the contemporary questions of development/underdevelopment, poverty, energy security, climate change, proliferation, ethnicity, terrorism, etc.

PS-S2-CO10 COMPARATIVE POLITICS

- The course offers theoretical and methodological issues in comparative politics. It seeks to enhance the students' understanding of politics, state, government, democracy, development, civil society, parties and interest groups, social movements from a comparative perspective.

III SEMESTER

PS-S3-CO11 POLITICAL THOUGHT: INDIAN TRADITION

- Students come across the rich political traditions of India from ancient, medieval and modern period.
- Feels proud about Indian culture and have insights into present - day understandings of Indian society and politics.

PS-S3-CO12 STATE AND POLITICS OF KERALA

- The course offers broad themes of state and politics of Kerala unfolding the historical trajectory of the democratic and institution building processes in the state.
- The course provides insights into critical questions concerning class and caste, political economy, democratic processes, migration, development, social movements, etc.

PS-S3-CO13 HUMAN RIGHTS IN INDIA

- The course facilitates the study of the concept of Human Rights, its origin and development, with special reference to India in the context of the Constitution and other laws.
- It also focuses on the rights of the marginalized groups, Public Interest Litigation, environment and Human Rights, new dimensions to Human Rights jurisprudence and legal protections available for the protection and promotion of Human Rights.

PS-S3-CO14 DECENTRALISATION AND LOCAL GOVERNANCE

- The course provides various stages of decentralization and the structure of local government which give insights into various concepts, theoretical and ideological foundations, legal setting, issues, complexities and practical aspects of the decentralisation and governance.
- A special focus is given to the Kerala experience as a state where participatory planning has been underway.

PS-S3-CO15 RESEARCH METHODOLOGY

- The course provides social science research perspective to the students. It offers various research methods (both qualitative and quantitative) used in Social Sciences.
- The empirical aspects will provide a broad understanding of various research methods and techniques, besides dealing with the practical realm of research.

IV SEMESTER

PS – S4 – CO16 INDIA'S FOREIGN POLICY

- Students understand basic principles and objectives of Indian Foreign Policy and India's relation with neighbouring countries, etc. Realise the strategic and significant role of India in Global politics.
- This course also enables the students to understand India's national security concerns and global commitments.

PS –S4 –EB1 POLITICAL THOUGHT: GANDHIAN TRADITION

- The course is designed to offer insights into Gandhian political thought dealing with a variety of categories and socio-political questions.
- It seeks to generate interest in understanding the importance of Gandhian thought in contemporary times focusing on subjects like power democracy, resistance and struggles.

PS – S4 - ED1 INTERNATIONAL POLITICAL ECONOMY

- The course seeks to familiarize the students with certain theoretical issues and empirical explanations in the field of International Political Economy. Students can understand global economic governance and international trade, finance and labour, besides the global economic crisis and issues of poverty and hunger in broader words.

PS – S4 – ED4 US GOVERNMENT AND POLITICS

- The course provides an introduction to the theoretical and political features of the US political system.
- The thrust of the course is on developing a critical understanding of and an appreciation for the working of the branches of the national government.

PS – S4 – ED8 UNITED NATIONS: PEACE AND GOVERNANCE

- The course helps to examine the history, purpose and structure of the United Nations.
- It aims to help students develop an analytical perspective towards the historical foundations of the United Nations, the politics of the structure of the UN, contemporary issues facing the global community, the historical as well as current role of the UN in the international political system