Course outcome Semester wise

Course: BSc

Subject: Physics

I Semester

Mechanics, properties of matter and Waves

- Familiarisation of the fundamental principles of formulations in mechanics the frames of references, vector derivatives, laws of conservation, properties of matter, fluid mechanics and simple harmonic motion and wave motion, complex waves analysis and development of applications skills.

II Semester

Thermal Physics, Sound and Electrostatics

- Clarity in the basic principles of thermodynamics, thermodynamic potentials, sound waves and electrostatics etc and development of problem solving skills.

III Semester

Electricity and Electromagnetic theory

- Clarity and good understanding in the basic principles of thermoelectricity, magnetism and electromagnetic theory, network theorems, analysis and AC circuits development of problem solving skills.

IV Semester

Optics, Atomic and Molecular Spectroscopy

- Clarity in the basic principles of phenomenon interference, diffraction, polarization etc and development of problem solving and application skills.

V Semester

Relativity, Nuclear Physics and Quantum Mechanics

(Elective Paper1)

- Clarity in the basic principles theoretical explanation of the special theory of relativity, cosmic rays and particle physics, nuclear Physics and quantum mechanics.

Mathematical physics

(Elective Paper2)

- Students will be able to solve problems of different mathematical series.

Lasers and Fibre Optics

(Compulsory Paper1)

- Familiarity with Optical components and devices and communication methods.

Astronomy and Astrophysics

(Compulsory Paper2)

- Familiarity with an introduction of astrophysics, measuring scales and units, stars and their characteristics and Cosmology.

Nano Materials
(Compulsory Paper3)

- Familiarity with an introduction of Nanotechnology, nanoscale, synthesis of nano materials, modern instrumentation and optical properties.

VI Semester
Solid State Physics, Electronics and communication
(Elective paper 1)

- Clarity in the basic principles theoretical explanation of the concepts, construction and working of semiconducting devices, their identification. About communication system

Medical physics
(Elective paper 2)

- Clarity in the mechanics, acoustics optical systems diagnostic and therapeutic systems related to human body.

Optoelectronics
(Compulsory Paper1)

- Familiarity with opto electronic devices, its working and their application.

Renewable Energy Sources
(Compulsory Paper2)

- Familiarity with renewable energy sources, uses and applications.

Solving Problems in Physics
(Compulsory Paper3)

- Students will be able to solve problems under different branches of physics.

Subject: Mathematics

I Semester

- Get the concept of symmetric, skew symmetric matrices, elementary row operations, echelon form, Solving homogeneous, Non homogeneous system of linear equations and Cayley-Hamilton theorem.
- Understand the concept of successive differentiation, homogeneous functions, Euler's theorem, Jacobian and properties.
- Memorize the concept of Reduction formulas for both Indefinite and definite integrals.

II Semester

- Able to define groups, abelian group, permutation groups, subgroups and understand the general properties.
- Understand the concept of polar co-ordinate system, pedal equations.
- Understand to solve problems on finding the curvature, radius of curvature, centre of curvature and general rules for various forms of curves tracing.
- Identify the applications of Integral calculus including volume of solids of revolutions.
- Learning the concepts of ordinary differential equations(O.D.E) and recognize the methods of solving Linear, Exact, Homogeneous and non Homogeneous differential equations.

III Semester

- Understand the concept of order of an element, Coset of a group, Cyclic group, index group and their properties.
- Learning the concept of different sequences and their properties.
- Able to determine different types of series and whether they converges.
- Memorise the concept of types of discontinuities, knowledge of mean value theorems and indeterminate forms.
- Able to represent a periodic function as a Fourier series.

IV Semester

- Able to define Normal subgroups, homomorphism, isomorphism and their properties.
- Understand the basic concept of Laplace transforms of some functions and standard results.
- Learning the concept of second and higher order ordinary linear differential equations.
- Analysing the convergence of sequence and series of functions.

V Semester

(Paper1)

- Understand the concept of calculus of variation.
- Compute line and multiple integrals and their applications.
- Indentify the concept of integral theorems and applications of triple integral.
- Learning the concept of vector space, linear transformation and properties.

(Paper2)

- Indentify the important classes of rings, integral domain, fields and properties.
- Able to calculate the gradient of a scalar, curl of a vector field, identify Solenoidal and irrotational vector fields.
- Get the knowledge of finite differences and variation of functions with equal and unequal intervals and numerical integration.

VI Semester

(Paper 1)

- Understand the fundamental concepts of complex analysis and the role in modern mathematics.
- Compute complex integration and bilinear transformation.
- Get the concept of numerical solutions of algebraic and transcendental equations.
- Learning solutions of initial value problems for first order ordinary linear differential equations.

(Paper2)

- Knowledge of vector space which is the foundation of linear algebra and its results.
- Learning linear transformations and standard properties.
- Able to determine the Fourier transformation of a given function and properties.

Subject: Computer Science

I Semester

Programming in C and Python

- Understanding Problem solving through computer programming
- Familiarity of programming environment in an operating system
- Ability to use different control structures
- Ability to deal with different input/output methods

II Semester

Problem Solving and Data Structure

- To understand the abstract data types stack, queue, deque, and list.
- To understand the performance of the implementations of basic linear and non linear data structures.
- To understand and implementation of data structures
- To be able to implement the abstract data type list as a linked list using the node and reference pattern

III Semester

Operating system and Software Engineering

- Analyze and synthesize system software
- Implement operating system functions
- Implementation of UNIX commands
- Decide on a process model for a developing a software project
- Classify software applications and Identify unique features of various domains
- Design test cases of a software system

IV Semester

RDBMS and Visual Programming

- Understanding database and database management system and RDBMs
- Describe different database architecture and analyses the use of appropriate architecture in real time environment
- Understanding how to design relational database
- Implementing relational database using SQL & PL/SQL
- Problem solving through computer object oriented programming
- Familiarity of programming environment in an .NET framework
- Ability to use different control structures
- Ability to design windows application
- Ability to do database connectivity

V Semester

JAVA and Computer Networks

(Elective1)

- Emphasis is on programming methods that includes creating and manipulating objects, classes and using object-oriented tools such as the class debugger
- Learn to design, code, test and debug Applet programming, Graphics Programming.
- Understanding topologies, transmission modes, transmission media, OSI and TCP/IP models.

Internet Programming

(Elective 2)

- Understanding HTML and HTML tags
- Implementing multimedia using HTML5
- Learn about coding, testing and debugging in JavaScript
- Learn about Cascading style sheet
- Embedding html , JavaScript and CSS and able to develop small website

Multimedia Computing

(Elective 3)

- Discuss the technical details of common multimedia data formats, protocols, and compression techniques of digital images, video and audio content.
- Describe and understand the technical details of JPEG and MPEG families of standards.
- Discuss the significance of "Quality of Service" in multimedia networking.
- Describe the principles and technical details of several wired and wireless networking protocols.
- Develop simple but demonstrative multimedia applications using JAI and JMF.

Office Automation

(Compulsory paper1)

- Learn about automation tools, word processing, Spreadsheets, Presentation tools

XML Programming

(Compulsory paper2)

- Design and code data transfer scripts using XML languages for the transfer of data over business networks and the Internet.
- Validate XML documents with the use of Document Type Definitions and schemas according to industry standards

VI Semester

Advanced visual Programming

(Elective 1)

- Ability create dynamic web pages using ASP.NET
- Implementation of web services
- Understanding client server technology
- Implementation of database connectivity to a web page
- Creating small websites

Object oriented Analysis and design

(Elective 2)

- Be able to use an object-oriented method for analysis and design
- Be able to analyze information systems in real-world settings and to conduct methods such as interviews and observations
- Have a general understanding of a variety of approaches and perspectives of systems development, and to evaluate other IS development methods and techniques
- Be able to know techniques aimed to achieve the objective and expected results of a systems development process
- Know different types of prototyping
- Know how to use UML for notation

Mobile Application

(Elective 3)

- Install and configure Android application development tools.
- Design and develop user Interfaces for the Android platform.
- Save state information across important operating system events.
- Apply Java programming concepts to Android application development.

R Programming

(Compulsory paper1)

- Understand the concepts of R programming language
- Manipulate data within R
- Perform basic data analysis procedures
- Create plots

Tally

(Compulsory paper2)

- Understanding accounts and types of accounts
- Able to create ledger, voucher and balance sheet using tally software