

Department of Physics

B. Sc. Physics Programme Course

Semester I (DSC)

Paper GET1:

Course Objective:

The objective of the course is to develop the foundation in mathematical physics, which includes basic methodologies in Calculus, vector algebra, calculus and their applications. The applications of these mathematical tools to comprehend different physical theories and solving practical physical problems related to Physics are to be highlighted.

After going through this course the students are expected to:

1. Develop the foundational knowledge on the basic calculus, including the idea of limits, continuity, differentiability etc.
2. Have a thorough knowledge on about frames of reference, Newton's laws of motion, Galilean transformation, conservation of momentum, dynamics of systems of particles.
3. Comprehend the relations between force, work and energy, idea of conservative and non-conservative force.
4. Have a detail knowledge on laws of Gravitation, potential fields for rigid bodies of different shapes.
5. Be introduced with the motion of particle under central force.

Outcome of the course:

After successfully completing the course the students were observed to:

1. Acquire the introductory knowledge on Newtonian mechanics.
2. Develop skills to solve problems related to mechanical systems.
3. Acquire knowledge on properties of dynamical systems.
4. Become familiar with the properties of systems under simple harmonic oscillation.
5. Acquire knowledge on elastic properties of materials and fluid motion.
6. Gain an appreciation on the special theory of relativity.
7. Become familiar with simple harmonic oscillator.
8. Have introductory ideas on elasticity of materials and fluid motions,
9. Have knowledge about special theory of relativity which includes ideas about Lorentz Transformations, simultaneity and order of events, Lorentz contraction, time dilation, relativistic transformation of velocity, frequency and wave number.

Paper GEP1:

Course Objective:

This course is designed to give students the experience of some traditional hand on experiments on mechanics. These experiments are related with the theoretical knowledge that they gather from paper T1.

After completing the course the students are expected to

1. Be familiar with the basic measuring instruments related to mechanics experiments.
2. Experimentally verify the theoretical knowledge with which they were introduced in course T1.

Outcome of the course:

After successfully completing the course the students were observed to:

1. Have the skill to carryout practical experiments related to mechanics and motion.
2. Comprehend the empiricism of the theoretical inputs of course T1.

Semester II

Paper GET2:

Course Objective:

The objective of the course is to develop the foundation in mathematical physics, which includes basic methodologies in Electricity and Magnetism. The course is designed to give students knowledge about electrostatics, magnetic properties, electromagnetic induction and basic concepts about electromagnetic nature of light.

After going through this course the students are expected to:

1. Gain knowledge about electricity and magnetism and to understand these phenomenon as a consequence of one another.
2. Be introduced to Faraday's law of electromagnetic induction.

Outcome of the course:

After successfully completing the course the students were observed to:

1. Understand the phenomenon of electricity and magnetism and their applications.
2. Understand transverse nature of electromagnetic waves and propagation of light as an electromagnetic wave.
3. Understand light as electromagnetic wave.

Paper GEP2:

Course Objective:

This course is designed to give students the experience of some traditional hand on experiments on electricity and magnetism. These experiments are related with the theoretical knowledge that they gather from paper T2.

After completing the course the students are expected to

1. Experimentally verify the theoretical knowledge with which they were introduced in course T2.

Outcome of the course:

After successfully completing the course the students were observed to:

1. Be familiar with the basic measuring instruments related to electricity and magnetism experiments.
2. Have the skill to carryout practical experiments related to mechanics and motion.
3. Comprehend the empiricism of the theoretical inputs of course T1.

Semester III (DSC and GE)

Paper GET3:

Course Objective:

This course aims to introduce the basic ideas of Kinetic theory of gases and the laws of thermodynamics. Application of these laws are to be applied in understanding the gaseous behaviour. The course briefly covers different topics like velocity distribution in gases, deviation of perfect gas from real behaviour and the different laws of thermodynamics, widely used in understanding gaseous nature.

After completing this course the students are expected to:

1. Understand the application of Maxwell's velocity distribution law and its applications in solving practical problems.
2. Get introduced to the concept of mean velocity, root mean square velocity, most probable velocity and their applications.
3. Have knowledge about molecular collision, free path, mean free path and the idea of relaxation time.

Outcome of the course:

After successfully completing the course the students are expected to:

1. Understand gaseous systems and solve problems based on mean velocity, RMS velocity and most probable velocity.
2. Acquire knowledge on molecular collisions and free paths.
3. Use thermodynamics to further address the different properties of gaseous systems.
4. Have knowledge on heat engines and their efficiency.
5. Understand the importance of thermodynamics in Physics.

6. Get introduced to different transport phenomenon's like viscosity, diffusion and thermal conductivity.
7. Get introduced to the concept of work and heat and to extend the idea to acquire knowledge about adiabatic and isothermal process.
8. Have a brief idea about the laws of thermodynamics and its applications.
9. Have knowledge about phase transition and basic concept of different thermodynamic potentials.

Paper GEP3:

Course Objective:

This course is designed to give students the experience of some traditional hand on experiments on heat and thermodynamics. These experiments are related with the theoretical knowledge that they gather from paper T3.

After completing the course the students are expected to

1. Experimentally verify the theoretical knowledge with which they were introduced in course T3.

Outcome of the course:

After successfully completing the course the students were observed to:

1. Have the skill to carryout practical experiments related to heat and thermodynamics.
2. Comprehend the empiricism of the theoretical inputs of course T3.
3. Be familiar with the basic measuring instruments related to heat and thermodynamics.

Paper Core SEC T2:

Course Objective:

This course aims to introduce the basics of computational methods in Physics, which will be helpful to the students for solving physics problems.

After completing the course the students are expected to

1. Use linux operating system for computational purpose and as an editor.
2. Be familiar with algorithms and flow chart for plotting different figures arising in physics problems.
3. Use latex for preparing documentation.

Outcome of the course:

After successfully completing the course the students were observed to:

1. Understand and develop skills in linux operating system for different computational purposes.
2. Be able to solve basic physics problems using Fortran and C++ computer languages.
3. Use latex with same ease as windows based Microsoft word.
4. Understand linux commands and basics of Fortran and C++ programming skills.