PO 1. Disciplinary Knowledge: Demonstrate comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate programme of study .

PO 2. Social Interaction: express thoughts and ideas effectively in writing and orally; listen and communicate with others using appropriate media. Work effectively and respectfully with diverse teams; act together as a group or a team in the interests of a common cause; Elicit views of others, mediate disagreements and help reach conclusions in group settings; .

PO 3. Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and act with an informed awareness of issues and participate in civic life through volunteering; embrace moral/ ethical values in conducting one's life, possess knowledge of the values and beliefs of multiple cultures and a global perspectives; engage in a multicultural society and interact respectfully with diverse groups.

PO 4. Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.

PO 5. Information and Digital Literacy: Use ICT in a variety of learning situations; demonstrate ability to access, evaluate and use a variety of relevant information sources; and use appropriate software for analysis of data.

PO 6. Research –related skills: Critically evaluate practices, policies and theories by following scientific approach to knowledge development. Have a sense of inquiry and capability for asking relevant/ appropriate questions, problematizing, synthesizing and articulating; ability to recognize cause- and-effect relationships, define problems, formulate hypotheses, interpret and draw conclusions from data, ability to plan, execute and report the results of an experiment or investigation; ability to apply one's learning to real life situations.

PSO 1. Understand the core theoretical concept of physics: Understand the core theoretical principles of physics.

PSO 2. Acquire analytical and logical skill for higher Education: Acquire the ability to analyse critical problems logically.

PSO 3. Excel in experimental physics and learn good laboratory practices and safety: Learn to handle experiments perfectly and safely.

PSO 4. Take up jobs in allied fields: Use the knowledge of physics to seek opportunities in other allied fields.

**Paper Name: Mathematical Physics I**
**Paper Code: PHY-HC-1016**

| Course Outcome |
|---|
| After the completion of this course, the students will be able to: |

1. Explain vector and its applications in various fields, [understand]
2. Interpret  differential equations and its applications, [apply]
3. Use different coordinate systems [apply]
4. Use concept of probability and error [apply]

| Mapping | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PSO1 | PSO2 | PSO3 | PSO4 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | M | | | M | H | H | H | M | M |
| CO2 | H | M | | | M | H | H | H | M | M |
| CO3 | H | M | | | M | H | H | H | M | M |
| CO4 | H | M | | | M | H | H | H | H | M |

**Paper Name: Mechanics**
**Paper Code: PHY-HC-1026**

| Course Outcome |
|---|
| After the completion of this course, the students will be able to: |

1. explain Inertial and non-inertial reference frames, Newtonian motion, Galilean transformations, projectile motion, [understand]
2. interpret work and energy, Elastic and inelastic collisions, [apply]
3. explain motion under central force, simple harmonic oscillations, [understand]
4. use special theory of relativity. [apply

| Mapping | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PSO1 | PSO2 | PSO3 | PSO4 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | M | | | | | H | M | | M |
| CO2 | H | M | | | | | H | M | | M |
| CO3 | H | M | | | | | H | M | | M |
| CO4 | H | M | | | | M | H | M | | M |

**Paper Name: Electricity and Magnetism**
**Paper Code: PHY-HC-2016**

| Course Outcome |
|---|
| After the completion of this course, the students will be able to: |
| 1. Explain electric and magnetic fields in matter, dilectric properties of matter magnetic properties of matter, electromagnetic induction. [understand] <br> 2. Apply Kirchhofff's law in different circuits. [apply] <br> 3. Apply network theorem in circuits. [apply] |

| Mapping | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PSO1 | PSO2 | PSO3 | PSO4 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | M | | | M | M | H | M | H | M |
| CO2 | H | H | | | H | H | H | H | H | M |
| CO3 | H | H | | | H | H | H | H | H | M |

**Paper Name: Waves & Optics**
**Paper Code: PHY-HC-2026**

| Course Outcome |
|---|
| After the completion of this course, the students will be able to: |
| 1. explain superposition of harmonic oscillations, different types of wave motions, superposition of harmonic waves, [understand] <br> 2. use interference and interferometer, diffraction, holography. [apply] |

| Mapping | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PSO1 | PSO2 | PSO3 | PSO4 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | M | | | | | H | M | | M |
| CO2 | H | M | | | | M | H | M | M | M |

**Paper Name: Mathematical Physics I**
**Paper Code: PHY-HC-3016**

| Course Outcome |
|---|
| After the completion of this course, the students will be able to: |
| 1. solve differential equation using power series solution method [apply] <br> 2. solve differential equation using separation of variables method, [apply] <br> 3. use special integrals, matrix, Fourier series. [apply] |

| Mapping | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PSO1 | PSO2 | PSO3 | PSO4 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | M | | | M | H | H | H | M | M |
| CO2 | H | M | | | M | H | H | H | M | M |
| CO3 | H | M | | | M | H | H | H | M | M |

**Paper Name: Thermal Physics**
**Paper Code: PHY-HC-3026**

| Course Outcome |
|---|
| After the completion of this course, the students will be able to: |
| 1. describe laws in thermodynamics, in particular: entropy, temperature, thermodynamic potentials, Free energies, [understand] |
| 2. explain Maxwell's relations in thermodynamics, behaviour of real gases. [understand] |

| Mapping | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PSO1 | PSO2 | PSO3 | PSO4 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | M | | | | | H | M | L | M |
| CO2 | H | M | | | | M | H | M | M | M |

**Paper Name: Digital Systems and Applications**
**Paper Code: PHY-HC-3036**

| Course Outcome |
|---|
| After the completion of this course, the students will be able to: |
| 1. Explain the working principle of CRO [understand] |
| 2. Apply digital logic to solve real life problems [apply] |
| 3. Analyze combinational logic circuits [analyze] |
| 4. Classify different semiconductor memories [understand] |
| 5. Organize sequential logic circuits [analyze] |
| 6. Analyze digital system design using PLD [analyze] |
| **7.** Implement combinational and sequential circuits [apply] |

| Mapping | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PSO1 | PSO2 | PSO3 | PSO4 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | H | M | | | H | M | H | H | L | M |
| CO2 | H | H | | L | H | H | H | H | M | H |
| CO3 | H | H | | | M | M | H | H | H | M |
| CO4 | H | M | | | L | M | H | H | M | M |
| CO5 | H | M | | | M | M | H | H | M | M |
| CO6 | H | H | | | M | M | H | H | H | M |
| CO7 | H | H | | | H | H | H | H | H | M |

**Paper Name: Mathematical Physics I**
**Paper Code: PHY-HC-4016**

| Course Outcome |
| --- |
| After the completion of this course, the students will be able to: <br> 1. solve complex integrals using residue theorem [apply] <br> 2. apply Fourier and Laplace transforms in solving differential equations [apply] <br> 3. explain properties of tensor like transformation of coordinates, contravariant and co-variant tensors, indices rules for combining tensors [understand] |

| Mapping | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PSO1 | PSO2 | PSO3 | PSO4 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CO1 | H | M | | | M | H | H | H | M | M |
| CO2 | H | M | | | M | H | H | H | M | M |
| CO3 | H | M | | | M | H | H | H | M | M |

**Paper Name: Elements of Modern Physics**
**Paper Code: PHY-HC-4026**

| Course Outcome |
| --- |
| After the completion of this course, the students will be able to: <br> 1. describe modern development in physics, starting from Planck's law, development of the idea of probability interpretation and the formulation of Schrodinger equation. [understand] <br> **2.** exaplin the structure of nucleus, radioactivity, fission and fusion [understand] <br> **3.** conceptualize the principle of Laser [understand] |

| Mapping | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PSO1 | PSO2 | PSO3 | PSO4 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CO1 | H | M | | | | H | H | H | | H |
| CO2 | H | M | M | M | M | M | H | H | M | M |
| CO3 | H | M | M | | | M | H | H | | M |

**Paper Name: Analog Systems and Applications**
**Paper Code: PHY-HC-4036**

| Course Outcome |
| --- |
| After the completion of this course, the students will be able to: <br> 1. Describe about the physics of semiconductor p-n junction and devices such as rectifier diodes, zener diode, photodiode etc. and bipolar junction transistors, transistor biasing and stabilization circuits [understand] <br> 2. Explain feedback in amplifiers and the oscillator circuits [understand] <br> 3. Classify operational amplifiers and their applications. [understand] |

| Mapping | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PSO1 | PSO2 | PSO3 | PSO4 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CO1 | H | M | | | M | H | H | H | M | M |
| CO2 | H | M | | | H | H | H | H | H | H |
| CO3 | H | M | | | M | H | H | H | H | H |

**Paper Name: Quantum Mechanics & Applications**
**Paper Code: PHY-HC-5016**

| Course Outcome |
| --- |
| After the completion of this course, the students will be able to: |
| 1. explain the principles in quantum mechanics, such as the Schrödinger equation, the wave function, the uncertainty principle, stationary and non-stationary states, time evolution of solutions, as well as the relation between quantum mechanics and linear algebra. [understand] <br> 2. apply Schrodinger equation to square well potential and harmonic oscillator [apply] <br> 3. solve the Schrödinger equation for hydrogen atom [apply] <br> 4. describe angular momentum and spin, as well as the rules for quantization and addition of these, spin-orbit coupling and Zeeman Effect. [understand] |

| Mapping | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PSO1 | PSO2 | PSO3 | PSO4 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CO1 | H | M | | | | H | H | H | | H |
| CO2 | H | M | | | M | H | H | H | | M |
| CO3 | H | M | | | M | M | H | H | | M |
| CO4 | H | M | | | | M | H | H | | M |

**Paper Name: Solid State Physics**
**Paper Code: PHY-HC-5026**

| Course Outcome |
| --- |
| After the completion of this course, the students will be able to: |
| 1. state the main features of crystal lattices and phonons [remember] <br> 2. describe the elementary lattice dynamics and its influence on the properties of materials [understand] <br> 3. describe the main features of the physics of electrons in solids [understand] <br> 4. explain the dielectric ferroelectric and magnetic properties of solids [understand] <br> 5. explain the basic concept in superconductivity. [understand] |

| Mapping | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PSO1 | PSO2 | PSO3 | PSO4 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CO1 | H | M | | L | L | L | H | M | L | M |
| CO2 | H | M | | L | L | M | H | H | L | M |
| CO3 | H | M | | L | L | M | H | H | L | M |
| CO4 | | M | L | M | L | M | H | H | L | M |
| CO5 | | M | | M | L | H | H | H | L | M |

**Paper Name: Electromagnetic Theory**
**Paper Code: PHY-HC-6016**

| Course Outcome |
| --- |
| After the completion of this course, the students will be able to: |
| 1. describe the Maxwell's equations, propagation of electromagnetic (EM) waves in different homogeneous-isotropic as well as anisotropic unbounded and bounded media [understand]<br>2. explain production and detection of different types of polarized EM waves [understand]<br>3. describe waveguides and fibre optics. [understand] |

| Mapping | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PSO1 | PSO2 | PSO3 | PSO4 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CO1 | H | M | | | | H | H | M | L | L |
| CO2 | H | M | M | | M | H | H | H | H | M |
| CO3 | H | M | M | | M | M | H | H | H | M |

**Paper Name: Statistical Mechanics**
**Paper Code: PHY-HC-6026**

| Course Outcome |
| --- |
| After the completion of this course, the students will be able to: |
| 1. apply Statistical Mechanics to in various fields including Astrophysics, Semiconductors, Plasma Physics, Bio-Physics, Chemistry and in many other directions. [apply] |

| Mapping | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PSO1 | PSO2 | PSO3 | PSO4 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CO1 | H | M | | | M | M | H | H | | M |