

Department of Physics

PROGRAM EDUCATIONAL OBJECTIVE

Technical Proficiency:

Provide a degree course, suitable for students of high ability, combining and relating Physics, Mathematics, and Chemistry.

Professional Growth:

Prepare students for further study, or for professional careers in areas requiring the application of scientific knowledge and skills.

Management Skills:

Equip students with ability to apply scientific knowledge to various problem solving techniques .

PROGRAMME OUTCOME

POs describe what students are expected to know or be able to do by the time of graduation from the program . The Program Outcomes of UG in Physics are:

At the end of the program the students will be able :

- To develop scientific thinking and apply it to various problem solving techniques.
- To understand basic laws of nature and their interrelations.
To apply physical theories in a vast domain ranging from very small to vary large distances .
- To understand importance of experiments in scientific theories and a working knowledge of various instruments for measurement of physical quantities .
- To pursue higher studies in PHYSICS.

UG Course Outcomes Physics

Year-I

Course Title: **Mechanics**

Paper- I

Status: Compulsory Course

Course Instructors: I. N.K.Naithani, Associate Professor

Dept. of Physics,

Mobile: 9690836550

Email: nknaithani@gmail.com

After Successful completion of this course, students will be able to:

- Know about reference frames and laws of motion.
- Apply knowledge of gravitational laws to motion of planets.
- Apply dynamics of rigid bodies to different practical problems.
- Know about elasticity and relation between different elastic properties.
- Understand properties of compressible matter and apply this knowledge to flow of fluids.



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Course Title: **Electricity and Magnetism**

Paper- II

Status: Compulsory Course

Course Instructors: 1. Dr Kunwar Singh
Dept. of Physics,

Mobile: 9410525437

Email: ksrphysics@gmail.com

After Successful completion of this course, students will be able to:

- Understand the concept of vector integrals .
- Apply concepts of gradient , divergence and curl to different physical problems.
- Learn Gauss theorem and its application
- Learn about properties of dielectrics and capacitors.
- Study Biot-Savart law and properties of magnetic materials
- Know about Maxwell's equations and appreciate the mathematical beauty of a physical theory.

Course Title: **Waves , oscillations and accoustics**

Paper- III

Paper Code-BM103

Status: Compulsory Course

Course Instructors: 1. N.K.Naithani, Associate Professor
2. Dr.Kunwar Singh, Assistant Professor
Dept. of Physics

After Successful completion of this course, students will be able to:

- Know about simple harmonic motion .
- Know about differential equation of wave motion and appreciate the importance of waves in daily life.
- Know forced oscillations and resonance.
- Learn physics of musical sounds.
- Know about acoustics of building and derive Sabine's formula.


Course Title: **Practicals**


Status: Compulsory Course

Course Instructors: 1. N.K.Naithani, Associate Professor
2. Dr.Kunwar Singh, Assistant Professor
Dept. of Physics

After Successful completion of this course, students will be able to:

- Apply theoretical knowledge to various practical problems .
- Verify theorem of parallel axis.
- Find modulus of rigidity of given material.
- Find moment of inertia of different objects using different techniques.
- Find frequency of AC mains .
- Demonstrate Stationary waves and use this concept to find frequency of electric vibrator and tuning forks .
- To study damping in oscillations and find damping constant.
- To find low resistances by using Carey-Foster bridge.
- To covert galvanometer into a voltmeter and ammeter.
- To find resistance of galvanometer.


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Year-II

Course Title: **Thermal Physics and Statistical Mechanics**

Paper- I

Course Instructors: 1. Dr. Kunwar Singh

2. N.K.Naithani

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After Successful completion of this course, students will be able to:

- Understand the concept of temperature.
- Know about laws of thermodynamics.
- State first and second laws of thermodynamics in precise mathematical forms.
- Understand concept of entropy and its importance
- Study relations between different thermo dynamical variables and potentials
- Understand radiation and derive Planck radiation formula
- Learn basic postulates of statistical mechanics
- Know about Maxwell distribution law for velocities and speeds
- Understand transport phenomena

Course Title: **Optics**

Paper- II

Course Instructors: 1. N.K.Naithani

Dept. of Physics

After Successful completion of this course, students will be able to:

- Know about nature of light and Fermat's principle of least time.
- Know about construction and working of different optical instruments
- Understand concept of superposition of waves and interference
- Understand phenomena of diffraction and its applications in optical instruments.
- To know about polarization of light

Course Title: **Solid State Physics**

Paper- III


Status: Compulsory Course


Course Instructors: 1. Dr. Kunwar Singh

Dept. of Physics

After Successful completion of this course, students will be able to:

- Define lattice and translational vectors.
- Understand the concept of reciprocal lattice and its application in crystal structure.
- Understand different methods to establish crystal structure .
- Understand elementary lattice dynamics.
- Explain the fundamental concepts of free electron theory
- To understand band theory of solids and its application in semiconductor physics.


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Course Title: **Practicals**

Status: Compulsory Course

Course Instructors: 1. N.K.Naithani, Associate Professor
2. Dr.Kunwar Singh, Assistant Professor
Dept. of Physics

After Successful completion of this course, students will be able to:

- Determine thermal conductivity of materials
- Determine mechanical equivalent of heat using Joule's calorimeter
- Determine mechanical equivalent of heat by Callender and Barne's method.
- Study statistical distribution using given data
- Determine wavelength of light by Newton's rings
- Determine wavelength of light using a biprism.
- Determine refractive index of material of prism
- Measure wavelength of light using diffraction grating
- To measure specific rotation of cane sugar.
- Determine resolving power of telescope.

Year-III

Course Title: **Quantum Mechanics**

Paper- I

Paper Code-

Status: Compulsory Course

Course Instructors: 1. N.K.Naithani

Dept. of Physics

After Successful completion of this course, students will be able to:

- Know the basic concepts of quantum theory.
- Understand mathematical formulation of quantum mechanics.
- Explain eigen functions and eigen values.
- Study one dimensional problems of a particle in a box and potential steps.
- Explain barrier penetration.
- Solve problem of hydrogen atom.

Course Title: **Modern Physics**

Paper- II


Paper Code-BM302

Course Instructors: 1. N.K.Naithani

2. Dr.Kunwar Singh

After Successful completion of this course, students will be able to:

- Understand different models of atomic structure.
- Know about atomic spectra and theories about their origin.
- Know about theory and working of LASERS;
- Know about structure of atomic nucleus and semi empirical mass formula;
- Understand radioactivity and nuclear energy.
- Explain nuclear fission and fusion.


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Course Title: **Basic Electronics**

Paper- III

Paper

Course Instructors: 1. Dr Kunwar Singh
Dept. of Physics,

After Successful completion of this course, students will be able to:

- Know about semiconductor diodes and optoelectronic devices;
- Understand working of power supplies and voltage regulator;
- Know about amplifiers and field FET;
- Explain negative feedback and self-sustained oscillations ;
- Know about multivibrators;
- Understand Boolean algebra and basics of digital circuits.


Course Title: **Practicals**


Status: Compulsory Course

Course Instructors: 1. N.K.Naithani, Associate Professor
2. Dr.Kunwar Singh, Assistant Professor
Dept. of Physics

After Successful completion of this course, students will be able to:

- Perform Franck-Hertz experiment
- Determine e/m by Thomson method
- Verify truth table for different gates
- Study I-V characteristics of diode
- Study I-V characteristics of zener diode
- Study pnp transistor in CE configuration
- Study npn transistor in CE configuration
- Determine Rydberg constant
- Find band gap of a semiconductor
- Determine Planck's constant


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