Rajkiya Mahavidyalaya, Barkot
Department of Physics

B.Sc. Physics
Programme Outcomes

At the end of the programme students will

- Acquire comprehensive knowledge and sound understanding of the fundamental concepts of Physics with the practical, analytical and mathematical skills.
- Have competence in handling scientific instruments and conducting minor projects.
- Develop human values, effective communication and writing skills and professional ethics.
- Be motivated towards academics, research, industry and be able to apply for different competitive exams such as JAM, JEST, CUET, state and national level civil services examination etc.

Course Outcomes

Course Title: Mechanics
Year: First

Upon successful completion of this course students will

- Understand fundamentals of rockets, global positioning system, geosynchronous orbits and satellites.
- Derive the expressions for gravitational potential and intensity, moment of inertia of different objects and relation among different elastic constants.
- Interpret dynamics of rigid bodies, conservative forces, elasticity and kinematics of fluid's motion.
- Decipher problems related to laws of motion, conservation of energy and momentum and Bernoulli's theorem.

Course Title: Electricity and Magnetism
Year: First

After successful completion of this course students will

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Co-ordinator, NAAC
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भौतिक विज्ञान विभाग
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- Have an understanding of capacitors, magnetism, inductance and Maxwell's equations.
- Learn applications of Gauss's theorem, vector integration, Biot-Savart's law and Faraday' laws of electromagnetic induction.
- Explain problems related to LCR circuits, electric potential and capacitance.
- Illustrate the phenomenon of polarization of EM wave and dielectrics.

Course Title: Waves, Oscillations and Acoustics
Year: First

After successful completion of this course students will be able

- To interpret the concepts of group velocity, superposition principle, resonance and acoustics of buildings.
- To analyze beats, Lissajous figures, simple harmonic oscillations and musical notes.
- To know the applications of Fourier's theorem, Sabine's formula, piezoelectric effect and ultrasonic waves.
- To elucidate the concepts of transverse and standing waves, forced and damped oscillations.

Course Title: Practicals
Year: First

After successful completion of this course students will be able

- To find value of acceleration due to gravity in the lab using bar and Kater's pendulum.
- To study elastic constant of a wire by Searle's method, bending of beam method, Maxwell's needle and Barton's apparatus.
- To determine moment of inertia of flywheel and irregular body using inertia table.
- To find out frequency of AC mains by using sonometer and Melde's method.
- To study series and parallel RC, LCR circuits, Carey Foster's bridge and potentiometer.
- Demonstrate measurements of length using Vernier calipers and screw gauge.
- Give illustrative representation of Lissajous figures.

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Course Title: Thermal Physics and Statistical Mechanics
Year: Second

Completion of this course will enable students to

- Comprehend the basic laws and processes of thermodynamics.
- Understand the concept of thermodynamic potentials and their physical interpretation.
- Know Joule-Thomson effect, Clausius-Clapeyron equation, heat engine and their applications in various real-life problems.
- Understand the concept of kinetic theory of gases and radiation.

Course Title: Optics
Year: Second

On completion of this course learners will

- Have knowledge of eyepieces, bi-prism and cardinal points of an optical system.
- Develop concepts regarding interference in thin films, zone plates and their applications.
- Have an understanding of interferometers, diffraction through slit, polarimeters and demonstrate experiments related to them.
- Be able to describe production and analysis of polarized light.

Course Title: Solid State Physics
Year: Second

After successful completion of this course learners will be able to

- Illustrate the concepts of crystal structure, reciprocal lattice, Miller indices and lattice vibrations.
- Distinguish between different types of magnetic materials, conductors, semiconductors and insulators.
- Explain x-ray diffraction by crystals, specific heat of solids, Hall effect, electrical conductivity, thermal conductivity and their applications.

Course Title: Practicals
Year: Second

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On completing this course learners will be able to

- Handle polarimeter, nodal slide and spectrometer.
- Practically understand the concepts of diffraction by a slit, diffraction grating, dispersion by a prism and interference in Newton's ring setup, resolving power of a telescope.
- Determine thermal conductivity of a good and bad conductor using Searle's and Lee's apparatus.
- Understand the laws of probability and verify it experimentally.
- Measure Joule's constant by Joule's calorimeter and Callender and Barne's method.
- Find Planck's constant using black body radiation.
- Verify Newton's law of cooling.

Course Title: Quantum Mechanics
Year: Third

After successful completion of this course students will be able to

- Know the genesis and formulation of quantum mechanics.
- Physically interpret and solve the time-dependent, time-independent Schrodinger equations.
- Identify different potential barriers and find their solutions by applying Schrodinger wave equation.
- Formulate Schrodinger equation and its solution of spherically symmetric systems.

Course Title: Modern Physics
Year: Third

On successful completion of this course students will

- Acquire understanding of different atomic and nuclear models.
- Elaborate the basics and applications of x-rays, LASERs and MASERs.
- Be able to develop understanding of radioactivity, fission and fusion and their applications.

Course Title: Electronics
Year: Third

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After completing this course successfully students will be able to

- Develop basic concepts of semiconductors and their applications electronics.
- Have knowledge of different types of transistors and transistor-based devices.
- Illustrate logic gates, applications of logic gates and perform Boolean algebra.

Course Title: Practicals
Year: Third

After completing this course students will have

- Comprehensive knowledge of p-n diode, Zener diode, bipolar transistors, JFET, MOSFET, UJT and their properties.
- Ability to perform Frank-Hertz experiment and study of CRO.
- Hands-on experience of handling Wein bridge oscillator, CE amplifier and rectifiers.
- Insight into digital electronics i.e., basic logic gates, adders and subtractors.
- Scientific knowledge of determining Planck's constant, e/m by Thomson, Helical and Magnetron method.
- Proficiency in identifying different electronic components such as resistors, capacitors, transistors.

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