

**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**

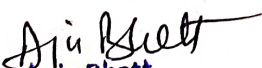
**Course Title: Mechanics**  
**Year: First**


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

  
Dr. Arju Bhatt  
Co-ordinator, NAAC  
Rajkiya Mahavidyalaya Barkot

  
विभाग प्रभारी  
भौतिक विज्ञान विभाग  
राजकीय महाविद्यालय, बड़काठ  
उत्तरकाशी

  
Rajkiya Mahavidyalaya Barkot  
Uttarakashi

- 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's 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.

*Anju Bhatt*  
Dr. Anju Bhatt  
Co-ordinator, NAAC  
Rajkiya mahavidyalaya Barkot  
Uttarkashi

*Lehar*  
Principal  
Rajkiya mahavidyalaya Barkot  
Uttarkashi

*Anchal*  
विभाग प्रमोद  
भौतिक विज्ञान विभाग  
राजकीय महाविद्यालय बड़कांठ  
उत्तरकाशी

**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

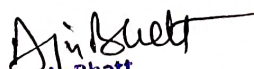
- Have knowledge of eyepieces, bi-prism and cardinal points of an optical system.
- Develop concepts regarding interference in thin films, zone plates and their applications.
- Have an understanding of interferometers, diffraction through slit, polarimeters and demonstrate experiments related to them.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

  
Dr. Anju Bhatt  
Co-ordinator, NAAC  
Rajkiya mahavidyalaya Barkot

  
Principal  
Rajkiya mahavidyalaya Barkot  
Uttarkashi

  
विभाग प्रमोदी  
भौतिक विज्ञान विभाग  
राजकीय महाविद्यालय बड़काट  
उत्तरकाशी

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**

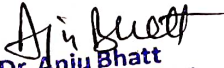
**Year: Third**


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**

  
Dr. Anju Bhatt  
Co-ordinator, NAAC  
Rajkiya mahavidyalaya Barkot  
Uttarkashi

  
Principal  
Rajkiya mahavidyalaya Barkot  
Uttarkashi

  
विभाग प्रभारी  
भौतिक विज्ञान विभाग  
राजकीय महाविद्यालय बड़काट  
उत्तरकाशी

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.

*Anchal*  
विभाग प्रमारी  
भौतिक विज्ञान विभाग  
राजकीय महाविद्यालय बड़काँट  
उत्तरकाशी

*Anju Bhatt*  
Dr. Anju Bhatt  
Co-ordinator, NAAC  
Rishi

*Usha*  
Rajkiya Mahavidyalaya Barkot  
Uttarkashi