

Kashi Naresh University, Bhadohi

Syllabus

of

Physics (Minor)

(National Education Policy-2020)

Effective from Academic Session: 2026-27

For
B.Sc.

Approved by

**Board of Studies
Department of Physics
Faculty of Science
Kashi Naresh University
Bhadohi**



Convenor/Head
Department of Physics
Kashi Naresh University, Bhadohi



Dean
Faculty of Science
Kashi Naresh University, Bhadohi



(Dr. Priyanka Srivastava)
Member of Board of Studies

(Dr. Raj Kumar Yadav)

Member of Board of Studies



(Dr. M.K. Vishwakarma)
Member of Board of Studies



(Dr. S.P. Mishra)
Member of Board of Studies

**B.Sc. (Physics): Second Semester
Minor Elective Paper**

Course Code: B010203MT	Course Title: Basic Electronics	Credits: 6
Course Outcomes (COs) • Recognize the basic components of electronic devices • Design simple electronic circuits • Study the characteristics of p-n junction diodes and transistors		
Unit-I Semiconductor, Intrinsic semiconductor, Extrinsic semiconductors, Working of p-n junction in unbiased forward and reverse bias, Formation of depletion layer, Biasing of p-n junction, V-I characteristics of p-n junction diode in forward and reverse bias.		
Unit-II Avalanche and Zener breakdown, Static and Dynamic resistance of a diode, Zener diode, Zener diode as voltage regulator, Light emitting diode, Photo diode, Tunnel diode.		
Unit-III Half wave rectifier, Full wave rectifier, Bridge rectifier, Filters, Series inductor filter, Shunt capacitor filter		
Unit-IV Transistor terminals, Working of p-n-p and n-p-n transistors, Characteristics of transistor in common base and Common emitter configuration, Current amplification factors and relation between them.		
Reference Books: • B.G. Streetman, S.K. Banerjee, “Solid State Electronic Devices”, Pearson Education India • R.L. Boylestad and L. Nashelsky, “Electronic Device and Circuit Theory’ Pearson India • S.L. Gupta, V. Kumar, “Hand Book of Electronics”, Pragati Prakashan, Meerut • V. Prakash, “Electric Circuits and Introductory Electronics” Lokbharti Prakasan, Allahabad		






B.Sc. (Physics): Fourth Semester

Minor Elective Paper

Course Code: B010403MT	Course Title: Atomic and Laser Physics	Credits: 6
Course Outcomes (COs) • Study the vector atomic model in the theory of atomic spectra. • Study the production and applications of X-rays. • Study the characteristics and various types of lasers.		
Unit-I Bohr Theory and Spectra of hydrogen, Space quantization and electron spin hypothesis, Stern Gerlach Experiment, Various quantum numbers of an electron relating to Vector Model of Atom, Spin- Orbit interaction Energy.		
Unit-II Continuous X-rays Spectrum, Duane and Hunts Law, Characteristics X-rays, Moseley Law, Doublet structure of X-rays Spectra, X-rays Absorption Spectra.		
Unit-III Laser Characteristics: Spontaneous and stimulated emission, Einstein's quantum theory of radiation Basic principle of lasers, population inversion, laser pumping, Threshold condition for Lasing, coherence and monochromaticity.		
Unit-IV Laser Systems: Solid state lasers- the ruby laser, Nd:YAG laser, semiconductor diode laser, Gas lasers - He-Ne laser, CO ₂ laser		
Reference Books: • H.E. White, "Introduction to Atomic Spectra", McGraw Hill • R Murugesan, K. Sivaprasath, "Modern Physics", S. Chand Publishing • K. Thyagarajan and A. K. Ghatak, "Lasers: Fundamentals and Applications", Springer • S.L. Gupta, V. Kumar, R.C. Sharma, "Elements of Spectroscopy", Pragati Prakashan • R. Kumar, "Atomic and Molecular Physics" KNRM Publication, Meerut		

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