Department of Physics
Part I: Course outcome

Name of Programme	Course/Paper	Name of course/Paper	Course outcome (should include one point for each unit of the paper)
B. Sc. I	Paper I	Physics - Mechanics, Oscillations and Properties of Matter	I-Grasping the fundamentals of different types of frames and transformation laws,different type of coordinate systems
			II - Understanding of rigid body motion including examples.
			III - Learn the fundamentals of oscillators including damped and forced and grasp the sigficant terms like quality factor and damping factor.
			IV - Learn the effect of electric and magnetic field on a charge particle.
			V - Learn the basics of properties of matter and laws for them including elasticity,viscosity and surface tension .
	Paper II	Physics- Electricity, Magnetism and Electromagnetic Theory	I - Students are expected to understand the use of mathematical operators-gradient,divergence and curl,understanding of different theorems for complicated circuits.
			II - Have gained the elaborated knowledge about electrostatics and laws governing the charge distribution.
			III - Study in depth about Polarisation,bound charges and boundary conditions,study of transient current response of CR,LC,LR and LCR circuits
			IV - To realize the importance of Biot- Savert law and Ampere's law
			V - Capable to solve a variety of problems related to Faraday's law and Maxwell's equations expected to understand displacement current as well.
B. Sc. II	Paper I	Physics- Thermodynamics, Kinetic Theory and Stastical Physics	I - Become familiar with laws of thermodynamics and various thermodynamical processes.
			II - Clear understanding of thermodynamial relationship.
			III - Understanding of maxwelliian distribution of speed and transport phenomena in gases.
			IV - Familiarize with the statistical basis of thermodynamics.
			V - Introduction to basic statistics- Maxwell-boltzman,bose-Einstien,Fermi-dirac statistics.
	Paper II	Physics- Waves, Acoustics and Optics	I - Understanding of waves, their propagation ,phenomena related to sound.
			II - Understanding of geometrical optics,image formation ,aberrations in images, optical instruments.
			III - Understanding of phenomena of interference and interferometer.
			IV - Understanding of diffraction and diffraction grating.
			V - Basic knowledge of LASER.

B. Sc. III	Paper I	Physics- Relativity, Quantum Mechanics, Atomic, Molecular and Nuclear Physics	I- Students will be able to understand different frames of reference, cocept of relativity and its applications .
			II- Capable to understand the origin of quantum theory and get the knowledge about wave properties of particles De-Broglie waves and its application.
			III- To find the solution of schrodinger equation for many system,familiarize with different quantum numbers.
			IV- To understand the spectra of hydrogen atom ,alkali atoms and fine structure of spectra.
			V- To understand different types of nuclear detectors,nuclear reactions and different atomic models.
	Paper II	Physics- Solid State Physics, Solid State Devices and Electronics	I- Understanding of different crystal structure and parameters.
			II- Understanding of electron model of metals,kronig-penny model,semiconductors,magnetic theory and principles for substance.
			III- Have a basic knowledge of semiconductor physics and devices.
			IV- Application of semiconductor devices,rectifier,amplifier and oscillators.
			V- Understanding of basics of computers hardware and introduction to programing.
M. Sc. I SEMESTER	Paper I	Physics - Mathematical Methods - I	I- Understanig of Matrices, eigen values and eigen vectors.
			II- Understanding of different theorems such as Cauchy - Riemann, Residue etc.
			III- Understanging of first and second order diffrential equation, and Green's functions.
			IV- Understanding of Legendre, Bessel, Hermite and Laguerre functions with their physical applications.
	Paper II	Physics - Classical Mechar	I- Understding of mechanics of particle, equation of motion of particleand D'Alembert principle.
			II- Deduction of different Principle and equations from Hamilton variational principle.
			III- Capable to understand the applications of Hamilton equation of motion.
			IV- Undersanding of Hamilton - Jacobi differential equation and Poisson Bracket.
	Paper III	Physics - Numerical Methods and Programming	I- Understanding of computational procedure and programming.
			II- Understanding of different statements and different concept associated with with different functions.
			III- Understanding of determination of zeros of linear, non linear, algebric equation and transcendental equations.
			IV- Understandng of numerical differention and Integarationand Newton cote's formula
	Paper IV	Physics - Electronics - I	I- Understanding of working of Transistor, JFET, MOSFE Tand UJT.
			II- Understanding of MISdiode, MOS diode and CC.
			III- Understanding of Microwave devices such as Tunnel diode, Gunn diode, Backward diode.
			IV- Understanding of Modulation and Demodulatio.

M. Sc. II SEMESTER	**Paper I**	**Physics - Quantum Mechanics -I**	**I-** Origin of Quantum theory and explanation of different phenomena on the basis of this theory.
			II- Some principles and theorems related with Quantum theory.
			III- Study of some physical quantity and problems on the basis of quantum mechanics.
			IV- Detailed study of hydrogen atom and its spectra on the basis of quantum mechanics.
	Paper II	**Physics - Laser Physics and applications**	**I-** Basic idea of LASER and its parameters.
			II- Study of different LASER systems.
			III- Advanced study of LASER physics.
			IV- Study of laser Physics in different fields.
	Paper III	**Physics - Electrodynamics**	**I-** Capable to understand maxwell's equation and wave propagation in different media.
			II- Different phenomena related with wave propagation and boundary conditions.
			III- Understanding of Einstein theory of special relativity and it's covariant form.
			IV- Understanding of relativistic electrodynamics.
	Paper IV	**Physics - Electronics - II**	**I-** Study of different type of transistors.
			II- Understanding the working and characteristic of different phototransistors.
			III- Detail study of operational amplifier.
			IV- Parameters related with practicals of operational amplifier.
M. Sc. III SEMESTER	**Paper I**	**Physics - Quantum Mechanics - II**	**I-** Different approximation methods to determine the energy states of Hydrogen and Helium atoms.
			II- Basic idea of scattering and its parameters.
			III- Study of different particles on the basis of time dependent perturbation theory.
			IV- Understanding of relativistic quantum mechanics and its formulation.
	Paper II	**Physics - Statistical Mechanics**	**I -** Foundation of statistical mechanics,microstates, macrostates and theorems related with them.
			II- Basic idea of ensemble theory.
			III- Formulation of quantum statistics, theory of ideal gases and different statistics.
			IV- Ideal Bose and Fermi gases and their thermodynamics behaviour.

M. Sc. III SEMESTER	**Paper III**	**Physics - Solid State Physics**	**I-** Theories and models for electron in solids and electronic properties.
			II- Effects and theory related with Fermi surfaces of metals.
			III- Lattice dynamics of monoatomic, diatomic gases and thermal properties.
			IV- Understanding of electron-phonon interaction and superconductivity.
	Paper IV	**Physics - Electronics - III**	**I-** Understanding of different number system and their conversion used in digital system.
			II- Understanding of different combinatinal logic circuits like adder, subtractor, coder, decoder, multiplexer, demultiplexer.
			III- Understanding different sequential logic circuits like flip- flop, registers and counters.
			IV- Idea of digital to analogue and analogue to digital converters, basic idea of integrated circuits .
M. Sc. IV SEMESTER	**Paper I**	**Physics- Solid State Physics - II**	**I-** Understanding of Plasmons and Polaritons
			II- Understanding of Maxwell's equations for dielectric and ferroelectrics.
			III- General idea of dia, para magnetism and different theory for them.
			IV- Understanding of Ferromagnetism and anti ferromagnetism.
	Paper II	**Physics- Atomic and Molecular physics**	**I-** Understandig of Bohr theory of Hydrogen atom and Hydrogen like atom.
			II- Understanding of Zeeman effect, Paschen Back effect and Stark effect.
			III- Understanding of Rotational and Vibrational Spectra.
			IV- Understanding of Rotational-Vibrational spectra and electronic spectra.
	Paper III	**Physics - Nuclear and Particle physics**	**I-** Understanding of Nucleon - neucleon interactionand Nuclear forces.
			II- Understanding of Beta and Gamma decay and selection rules.
			III- Understanding of different nuclear model such as liquid drop, shell model etc.
			IV- Understanding of elementary particle and Quark model.
	Paper IV	**Physics - Electronics - IV**	**I-** Understanding of memory, magnetic memory and networking in microprocessor.
			II- Understanding of Intel 8085 and time diagram.
			III- Understanding of instruction set of 8085 and addressing modes.
			IV- Understanding of Optical fiber and types of optical fiber.

Part II: Programme outcome

Name of programme/degree	Name of subject	Programme outcome
B. Sc.	B. Sc. - PHYSICS	After successful completion of three year Undergratuate degree program in physics a student should be able to: - PO -1 Demonstrate, solve and an understanding of major concepts in all disciplines of physics. PO- 2 Solve the problem and also think methodically, independently and draw a logical conclusion. PO-3. Employ critical thinking and the scientific knowledge to design, carryout, record and analyze the results of Physics experiments. PO-4. Create an awareness of the impact of Physics on the society, and development outside the scientific community. PO-5. To inculcate the scientific temperament in the students and outside the scientific community. PO-6 - Gain the knowledge to appear and qualify the diffenent competetive exams such as PSC, UPSC, SSC, BANK, RAILWAYS, SCHOOL TEACHER EXAM etc.
M. Sc.	M. Sc. PHYSICS	After successful completion of two year Post Gratuate degree program in physics a student should be able to: - PO-1. Apply the skill and knowledge in the design and development of electronic circuits to fulfill the needs of small scale electronic industry. PO-2.Demonstrate, solve and an understanding of major concepts in all disciplines of physics. PO-3. Solve the problem and also think methodically, independently and draw a logical conclusion. PO-4. Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of Physics experiments. PO-5. Create an awareness of the impact of Physics on the society, and development outside the scientific community. PO- 6. To inculcate the scientific temperament in the students and outside the scientific community. PO-7. Use modern techniques, computer and Microprocessor. PO-8. Become professionally trained in the area of electronics, material science, lasers and nonlinear circuits. PO-9 - Gain the knowledge to appear and qualify the diffenent competetive exams such as NET, SET, GATE, PSC, UPSC, SSC, BANK, RAILWAYS, SCHOOL TEACHER EXAM etc