

Program outcomes, program specific outcomes and course outcomes of Physics Department

<p>Subject specific outcomes</p>	<ul style="list-style-type: none"> • Students gain knowledge and skill in Physics. • Apply the knowledge and perform various experiments based on the knowledge of physics. • Analyze Newtonian mechanics, Dynamics of rigid body, various properties of matter like elasticity, viscosity, surface tension. • Understands the oscillatory motion, special theory of relativity, electrostatics, magneto-statics, thermodynamics and light phenomenon like interference of light, diffraction, polarization their role in various technological instrumentations. • Understand the failure of classical physics in some modern experiments and development of quantum mechanics. • Gain knowledge of crystal structures, radioactivity, nuclear physics and classical and quantum statistics. • Understands the role of LASER, X-ray and radioactive rays in the field of medical science. • Understand the role of semiconductor devices in electronic, digital and computer industry.
<p>Program specific outcomes</p>	<ul style="list-style-type: none"> • Understand the basic concepts of Newton's laws, Center of mass, Moment of Inertia, Momentum, Energy, Rotational motion, Lorentz transformations, gravitation, Oscillations, frequency, wavelength, surface tension, Viscous force, Moduli of Elasticity, Kinetic theory of gases, heat engine and efficiency, Laws of thermodynamic, Black body radiation, M-B, B-E and F-D statics, Schrodinger equation, wave packets, applications of Schrodinger equation, atomic model and stability, Natural and artificial radioactivity, use of isotope for various applications, Fission and fusion phenomenon, Nuclear reactions, dielectric and magnetic properties of matter and solid state physics. • Perform procedures as per laboratory standards in the areas of Gravitation, modulus of rigidity, Surface tension, heat and energy, semiconductor device, probability distributions, spectroscopy, planks law, hydrogen spectra, crystal structure parameters and prism spectra, resolving power dispersive power, Brewster's law etc. • Understand the applications of X-ray, radioactive isotopes, LASER beam and semiconductor device, in Agriculture, Medicine, electronic industry and computer technology.

GONDWANA UNIVERSITY, GADCHIROLI
CBCS COURSES IN B. SC. PHYSICS

SEMESTER - I

PAPER CODE	CORE PAPER	TITLE OF THE PAPER	CREDIT
USPHT01	I	MECHANICS AND RELATIVITY	02
USPHT02	II	GRAVITATION, OSCILLATION AND PROPERTIES OF MATTER	02
USPHP01	PRACTICAL	CORE COURSE I & II	02

SEMESTER - II

PAPER CODE	CORE PAPER	TITLE OF THE PAPER	CREDIT
USPHT03	III	VECTOR ANALYSIS AND ELECTROSTATICS	02
USPHT04	IV	MAGNETOSTAICS AND ELECTROMAGNETIC WAVES	02
USPHP02	PRACTICAL	CORE COURSE III & IV	02

SEMESTER- III

PAPER CODE	CORE PAPER	TITLE OF THE PAPER	CREDIT
USPHT05	V	THERMAL PHYSICS	02
USPHT06	VI	RADIATION AND STATISTICAL PHYSICS	02
USPHP03	PRACTICAL	CORE COURSE V & VI	02

SEMESTER- IV

PAPER CODE	CORE PAPER	TITLE OF THE PAPER	CREDIT
USPHT07	VII	WAVES, ACOUSTICS AND LASER	02
USPHT08	VIII	OPTICAL PHYSICS	02
USPHP04	PRACTICAL	CORE COURSE VII & VIII	02

SEMESTER -V

PAPER CODE	CORE PAPER	TITLE OF THE PAPER	CREDIT
USPHT09	ANY TWO	ELEMENTS OF MODERN PHYSICS	02
USPHT10		SOLID STATE PHYSICS	02
USPHT11		MEDICAL PHYSICS	02
USPHT12		MATHEMATICAL PHYSICS	02
USPHP05	PRACTICAL	CORE COURSE	02

SEMESTER -VI

PAPER CODE	CORE PAPER	TITLE OF THE PAPER	CREDIT
USPHT13	ANY TWO	NUCLEAR AND PARTICLE PHYSICS	02
USPHT14		DIGITAL AND ANOLOG CIRCUITS AND INSTRUMENTATION	02
USPHT15		QUANTUM MECHANIC	02
USPHT16		EMBEDDED SYSTEM- INTRODUCTION TO MICROCONTROLLERS	02
USCZOP06	PRACTICAL	CORE COURSE	02

Scheme of Marks of Theory and Practical

Semester	Paper	Title	Marks		Total
			Theory	Internal Assessment	
I	I	MECHANICS AND RELATIVITY	50	10	150
	II	GRAVITATION, OSCILLATION AND PROPERTIES OF MATTER	50	10	
	Practical	Core course I and II practical based on paper I and paper II	30	-	
II	I	VECTOR ANALYSIS AND ELECTROSTATICS	50	10	150
	II	MAGNETOSTAICS AND ELECTROMAGNETIC WAVES	50	10	
	Practical	practical based on above papers I and paper II	30	-	
III	I	THERMAL PHYSICS	50	10	150
	II	RADIATION AND STATISTICAL PHYSICS	50	10	
	Practical	practical based on above papers I and paper II	30	-	
IV	I	WAVES, ACOUSTICS AND LASER	50	10	150
	II	OPTICAL PHYSICS	50	10	
	Practical	practical based on above papers I and paper II	30	-	
V	I	ELEMENTS OF MODERN PHYSICS	50	10	150
	II	SOLID STATE PHYSICS	50	10	
	Practical	practical based on above papers I and paper II	30	-	
VI	I	NUCLEAR AND PARTICLE PHYSICS	50	10	150
	II	DIGITAL AND ANOLOG CIRCUITS AND INSTRUMENTATION	50	10	
	Practical	practical based on above papers I and paper II	30	-	

COURSE SPECIFIC OUT COMES

B.SC. I

SEMESTER – I

PAPER CODE	CORE PAPER	TITLE OF THE PAPER	COURSE SPECIFIC OUTCOMES
USPHT01	I	MECHANICS AND RELATIVITY	<ul style="list-style-type: none">Describe Inertial and non-inertial frame of reference and Newton's laws of motion.Describe center of mass, linear momentum and equation of center of mass.Gives idea of work, energy and collision.Describe moment of inertia, rigid dynamics and Einstein's special theory of relativity.
USPHT02	II	GRAVITATION, OSCILLATION AND PROPERTIES OF MATTER	<ul style="list-style-type: none">Describe Gravitational laws, and free, damped and forced oscillations.Material properties such as elasticity, viscosity and surface tensionModulii of elasticity were interrelated
USPHP01	PRACTICAL	Practical based on above papers	<ul style="list-style-type: none">Experiments based on gravitation, acceleration due to gravity, elasticity, viscosity.

SEMESTER –II

PAPER CODE	CORE PAPER	TITLE OF THE PAPER	COURSE SPECIFIC OUTCOMES AT THE END OF COURSE STUDENTS WILL ABLE TO UNDERSTAND
USPHT03	III	VECTOR ANALYSIS AND ELECTROSTATICS	<ul style="list-style-type: none">Describe mathematical formulation useful to understand physical properties such as vectors, scalars, gradient, divergence, curl, and surface and volume integration.Electrostatics, dipole and qudrapole moments, Gauss law, capacitance, dielectric measurements and other related terms
USPHT04	IV	MAGNETOSTAICS AND ELECTROMAGNETIC WAVES	<ul style="list-style-type: none">Describes important physics of Magneto statics, Biot-Savert law, magnetic field, magnetic intensity , Kirchhoff's law, magnetic inductionUnderstand Maxwell's relation for

			<p>electromagnetic wave, their propagation in vacuum and other medium.</p> <ul style="list-style-type: none"> • Current in LR, CR, LCR circuits, the rise and decay of current, various electric bridges
USPHP02	PRACTICAL	practical based on above papers	<ul style="list-style-type: none"> • Experiments based on electric circuits, Electric Bridges, Various theorem, impedances, and measurements of dielectric constant.

B. Sc. II

Semester III

PAPER CODE	CORE PAPER	TITLE OF THE PAPER	COURSE SPECIFIC OUTCOMES AT THE END OF COURSE STUDENTS WILL ABLE TO UNDERSTAND
USPHT05	V	THERMAL PHYSICS	<ul style="list-style-type: none"> • Imparts conceptual knowledge of kinetic theory of gases, mean free path and derivation, effect of temperature and pressure, transport phenomenon. • Laws of thermodynamics: zeroth, first, second, Carnot cycle and efficiency of Heat engine. • Various energy function, latent heat, free energy, Enthalpy, entropy, Gibb's free energy and thermodynamic effects like Thomson effect, Latent heat equations, etc.
USPHT06	VI	RADIATION AND STATISTICAL PHYSICS	<ul style="list-style-type: none"> • Understand phenomenon of Black body radiation and various radiation laws such as Wiens law, Rayleigh-Jeans law, Stefan's law, Plank's law. • Space, phase phase, Maxwell's Boltzmann distribution and probability laws. • Quantum mechanical probability laws such as Bose-Einstein, Fermi-Dirac etc.
USPHP03	PRACTICAL	Practical based on above papers	<ul style="list-style-type: none"> • Practical on heat and radiation laws.

Semester IV

PAPER CODE	CORE PAPER	TITLE OF THE PAPER	COURSE SPECIFIC OUTCOMES AT THE END OF COURSE STUDENTS WILL ABLE TO UNDERSTAND
USPHT07	VII	WAVES, ACOUSTICS AND LASER	<ul style="list-style-type: none"> • Gains knowledge about superposition two harmonic oscillators and their result as a Lissajous figures at different frequencies and phases, phase velocity and group velocity etc. • Understood acoustic waves, noise and intensity of loudness to gain the knowledge of design of acoustic hall and auditorium. • Production and theory of LASER
USPHT08	VIII	OPTICAL PHYSICS	<ul style="list-style-type: none"> • Seeks to understand the light phenomenon such as interference of light, Diffraction and polarization. • Understood the theoretical formalism of Newtons rings, Michelson's rings and Fizeu's fringes. • Understood the construction concepts of prism, grating, double prism and nicol's prism.
USPHP04	PRACTICAL	Practical based on above papers	<ul style="list-style-type: none"> • Practical on sound, Lissajous figures and light phenomenon.

B. Sc. III**Semester V**

PAPER CODE	CORE PAPER	TITLE OF THE PAPER	COURSE SPECIFIC OUTCOMES AT THE END OF COURSE STUDENTS WILL ABLE TO UNDERSTAND
USPHT09	OPTED AS A CORE PAPER	ELEMENTS OF MODERN PHYSICS	<ul style="list-style-type: none"> • Gives experimental evidence of failure of classical theory and development of quantum theory • Representation of matter wave in the form of wave packet. • Derivation Schrödinger equation and applications for various potential are discussed. • Radioactivity concepts and decay process. • Understood fission and fusion process.
USPHT10	OPTED AS A CORE PAPER	SOLID STATE PHYSICS	<ul style="list-style-type: none"> • Understanding of crystal structures, diffraction by lattice and determination of lattice parameter. • Understanding of fundamental dia, para and ferromagnetic materials, and dielectric properties of solids. • Elementary band theory of solids and superconductivity concepts.
USPHP05	PRACTICAL	Practical based on above papers	<ul style="list-style-type: none"> • Practical on solid state physics and crystallography.

B.Sc. III Semester VI

PAPER CODE	CORE PAPER	TITLE OF THE PAPER	COURSE SPECIFIC OUTCOMES AT THE END OF COURSE STUDENTS WILL ABLE TO UNDERSTAND
USPHT13	OPTED AS A CORE PAPER	NUCLEAR AND PARTICLE PHYSICS	<ul style="list-style-type: none"> • Gives knowledge related to the nuclear models, exoergic and endoergic reaction, interaction of nuclear radiation with matter, Cerenkov radiations. • Practical accelerators, and various counters
USPHT14	OPTED AS A CORE PAPER	DIGITAL AND ANALOG CIRCUITS AND INSTRUMENTATION	<ul style="list-style-type: none"> • Digital logic gates, logic circuits, various Booleans laws, and adders. • Semiconductors, power supply, transistors, amplifiers, IC's, operational amplifiers and applications for various operations
USPHP06	PRACTICAL	Practical based on above papers	<ul style="list-style-type: none"> • Practical on digital and solid state electronics.