COURSE OUTCOMES

Department of Physics

F. Y. B.Sc.	
SEM-I	
PAPER 1 Course Title: Classical Physics Course Code: USPH101	
CO1	Understand Newton's laws and apply them in calculations of the motion of simple systems.
CO2	Use the free body diagrams to analyze the forces on the object.
CO3	Understand the concepts of friction and the concepts of elasticity, fluid mechanics and to be able to perform calculations using them.
CO4	Understand the concepts of lens system and interference.
CO5	Comprehend the basic concepts of thermodynamics & its applications in physical situation. Learn about situations in low temperature.
CO6	Demonstrate quantitative problem solving skills in all the topics covered
PAPER 2 Course Title: Modern Physics Course Code: USPH102	
CO1	Understand concept of Radioactivity ,nuclear properties and nuclear behavior.
CO2	Understand the type isotopes and their applications. Carbon dating and its applications.
CO3	Understand the concept of various types of nuclear reaction, fission and fusion
CO4	Understand and demonstrate quantum mechanical concepts.
CO5	Demonstrate problem solving skills in all topics in the syllabus.
SEM-II	
PAPER 1 Course Title: Mathematical Physics Course Code: USPH201	
CO1	Understand the basic concepts of mathematical physics and their applications in physical situations.
CO2	Understand electrical concepts and applications of passive components (R,C,L)in everyday life
CO3	Apply mathematical concept to Superposition of Collinear Harmonic oscillations and concept of beats
CO4	Demonstrate quantitative problem solving skills in all the topics covered.
PAPER 2 Course Title: Electricity and Electronics Course Code:USPH202	
CO1	To understand difference between A.C. and D.C Voltages , to know about A.C. C-R , L-R , Series L-C-R and Parallel L-C-R Circuits. To study Phasor diagrams in A.C. Circuits
CO2	To study and compare different types of A.C. Bridges.
CO3	Understand various circuit theorems and their application in solving different electrical networks
CO4	Understand the concept of power supply, clippers and clampers and various digital electronic circuits.
CO5	Understand basic quantities like charge, forces in between them, electric fields produced by them etc. and sources of magnetic field.

S.Y.B.Sc	
SEM-III	
PAPER 1 Course Title: Mechanics and Thermodynamics Course Code:USPH301	
CO1	Understand concept of mechanics and properties of matter and use it to solve problems.
CO2	Understand basic concepts of thermodynamics and its applications in physical situation.
CO3	Understand the methods of obtaining low temperatures.
CO4	Understand thermodynamical concepts by solving the problems.
CO5	Understand importance of thermodynamical concepts in day today life.
PAPER 2 Course Title: Vector calculus, Analog Electronics Course Code:USPH302	
CO1	Understand the basic concepts of mathematical physics and their applications in physical situations.
CO2	Understand the basic laws of electrodynamics and be able to perform calculations using them.
CO3	To understand working of transistors , biasing and designing of different types transistor circuits.
CO4	To understand difference between Amplifiers and Oscillators. To know different types of Oscillators
CO5	Understand functioning and different types of OPAMP Circuits
PAPER 3 Course Title: Applied Physics-I Course Code: USPH303	
CO1	Students will be exposed to contextual real life situations.
CO2	Students will appreciate the role of Physics in interdisciplinary areas related to materials, Bio Physics, Acoustics etc.
CO3	The learner will understand the scope of the subject in Industry & Research.
CO4	Experimental learning opportunities will faster creative thinking & a spirit of inquiry.
SEM-IV	
PAPER 1 Course Title: Optics and Digital Electronics Course Code:USPH401	
CO1	Understand and differentiate between Fresnel and fraunhofer diffraction of light due to various diffracting systems.
CO2	Understand polarization effect produced in the light and different types of polarization and polarizing materials.
CO3	Understand the concept of digital electronics and working of digital electronic circuits.
CO4	Understand different optics phenomena like reflection, refraction, diffraction, polarization etc. by performing the experiments and fabrication of different digital electronic circuits.
CO5	Understand day today life events by applying the concepts studied in the course.
PAPER 2 Course Title: Quantum Mechanics Course Code: USPH402	
CO1	To Understand difference between Classical Mechanics and Quantum Mechanics. Understand about Wavefunction , operators , Eigen Values , Expectation Values
CO2	Understand Postulates of Quantum Mechanics , Schrodinger's time dependent and time Independent equation
CO3	UnderstandApplications of Schrodinger's Steady state Equations i.e Free particle , Particle in infinitely deep potential well ,Particle infinitely deep potential well , Step potential

CO4	UnderstandApplications of Schrodinger's Steady state Equations i.e. Potential barrier , tunnel effect , theory of alpha decay
CO5	Know about Harmonic Oscillator
	PAPER 3 Course Title: Applied Physics-II Course Code: USPH403
CO1	Understand about the earth and various concepts and phenomena related to earth using physical methods
CO2	Comprehend the basic concepts of thermodynamics & its applications in physical situations.
CO3	Understand the concept of various communication techniques
CO4	Demonstrate tentative problem solving skills in all above areas.
CO5	Understand the concept of microprocessor and build up various programs using instructions of microprocessor 8085.
T.Y.B.Sc	
SEM-V	
PAPER 1 Course Title:Mathematical , Thermal and Statistical Physics Course Code:USPH501	
CO1	Understand some mathematical techniques required for the physical phenomena at the undergraduate level and get exposure to important ideas of statistical mechanics.
CO2	Understand Concept of probability and solve simple problems in probability.Understand the concept of independent events and work with standard continuous distributions.
CO3	Explore to idea of the functions of complex variables; solve nonhomogeneous differential equations and partial differential equations using simple methods.
CO4	Understand the concept of microstates, Boltzmann distribution and statistical origins of entropy.
CO5	Demonstrate quantitative problem solving skills in all the topics covered.
	PAPER 2 Course Title: Solid State Physics Course Code: USPH502
CO1	Understand the basics of crystallography, Electrical properties of metals.
CO2	Understand Band Theory of solids, demarcation among the types of materials, Semiconductor Physics and Superconductivity.
CO3	To understand conduction in semiconductors and BCS theory of superconductivity.
CO4	Understand the basic concepts of Fermi probability distribution function, Density of states
CO5	Demonstrate quantitative problem solving skills in all the topics covered.
	PAPER 3 Course Title: Atomic and Molecular Physics Course Code:USPH503
CO1	The application of quantum mechanics in atomic physics
CO2	The importance of electron spin, symmetric and antisymmetric wave functions and vector atom model
CO3	Effect of magnetic field on atoms and its application
CO4	Learn Molecular physics and its applications.
CO5	This course will be useful to get an insight into spectroscopy.
	PAPER 4 Course Title: Electrodynamics Course Code: USPH504
CO1	Understand laws of electrostatics in vacuum and apply it to solve the problems
CO2	Understand laws of electrostatics in matter and magnetostatics in vacuum and apply it to solve the problems.

CO3	Understand laws of magnetostatics in matter and development of Maxwells equations in electrodynamics and apply them to solve the problems.
CO4	Understand application of electromagnetic theory to study the behaviour of light waves
CO5	Understand laws electrodynamics and apply them to solve the problems
Applied Component: **Course Title: Analog Circuits, Instruments and Consumer Appliances. Course Code:USACEI501**	
CO1	Understand the difference between a transducer and a sensor.
CO2	Understand the construction, working and uses of different types of transducers.
CO3	Understand the concept Data Acquisition and Conversion
CO4	understand construction of different electronic circuits using chips and semiconductor devices.
CO5	Understand usefulness of chip technology to develop different household appliances and medical imaging devices.
SEM-VI	
PAPER 1 Course Title: Classical Mechanics Course Code: USPH601	
CO1	Understand Motion under a central force, Elliptic orbits, The Kepler problem.
CO2	Concept of coordinates, Rotating coordinate systems, Laws of motion on the rotating earth, The Foucault pendulum, Larmor's theorem.
CO3	The introduction to simple concepts from fluid mechanics and understanding of the dynamics of rigid bodies
CO4	Understand difference between Lagrangian Mechanics and Newtonian Mechanics , to study various examples by Lagrangian Equations.
CO5	Understand the drastic effect of adding nonlinear corrections to usual problems of mechanics and how nonlinear mechanics can help understand the irregularity we observe around us in nature.
PAPER 2 Course Title: Electronics Course Code: USPH602	
CO1	Understand the basics of semiconductor devices and their applications.
CO2	Understand the basic concepts of Operational amplifier: its prototype and applications as instrumentation amplifier, active filters, comparators and waveform generation.
CO3	Understand the basic concepts of timing pulse generation and regulated power supplies
CO4	Understand the basic electronic circuits for universal logic building blocks and basic concepts of digital communication.
CO5	Develop quantitative problem solving skills in all the topics covered.
PAPER 3 Course Title: Nuclear Physics Course Code: USPH603	
CO1	To understand the fundamental principles and concepts governing classical nuclear and particle physics
CO2	Knowledge about the distribution of electrons in atoms and molecules
CO3	Gain knowledge of particle physics applications and interactions of ionizing radiation with matter the key techniques for particle accelerators the physical processes involved in nuclear power generation.
CO4	Knowledge on elementary particles will help students to understand the fundamental constituents of matter and lay foundation for the understanding of unsolved questions about dark matter, antimatter and other research oriented topics.

CO5	Develop quantitative problem solving skills in all the topics covered.
	PAPER 4 Course Title: Special Theory of Relativity Course Code:USPH604
CO1	Understand significance of Michelson Morley experiment and failure of existing theories to explain null result of experiment.
CO2	Understand importance of Einsteins postulates of special theory of relativity, Lorentz space-time transformation equations, absoluteness and relativity
CO3	Understand transformation equations of mechanical quantities such as velocity, acceleration, momentum force and mass energy equivalence.
CO4	Understand transformation equations of electric and magnetic fields and essence of general theory of relativity.
CO5	Understand how Einsteins theory of relativity is applicable to study events in space.
Applied Component: **Course Title: Digital Electronics, Microprocessor, Microcontroller and OOP** **Course Code:USACEI601**	
CO1	Analyze/design and implement combinational logic circuits.
CO2	Understand various advance instructions of microprocessor 8085 and build up various programs using advanced instruction.
CO3	Understand the concept of 8255 Programmable Peripheral device and its use to connect various I/O devices to microprocessor
CO4	Understand usefulness of C++ programming language.
CO5	Understand applications of C++ programming language.