

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

UG COURSES – AFFILIATED COLLEGES B.Sc. PHYSICS

(Choice Based Credit System)

(With effect from the academic year 2017-2018 onwards)

B.Sc. PHYSICS-SKILL MATRIX

COURSE STRUCTURE

Semester	PART-I/ II/III IV/V	Subject Status	Subject title	Course /paper	Contact Hrs./ Week	Credits
I	I	Language	Tamil/Other Language	1	6	4
	II	Language	English	1	6	4
	III	Core 1	Mechanics and Relativity	1	4	4
	III	Core 2	Properties of matter and acoustics	1	4	4
	III	Major Practical-I	Practical-I	1	2	2
	III	Allied Paper-1	Allied Physics Paper-1	1	4	4
	III	Allied Practical-1	Allied Practical-1	1	2	2
	IV	Common	Environmental Studies	1	2	2
			Sub total	8	30	26
II	I	Language	Tamil/Other Language	1	6	4
	II	Language	English	1	6	4
	III	Core-3	Thermal Physics and Relativity	1	4	4
	III	Core-4	Optics	1	4	4
	III	Major Practical-2	Practical-2	1	2	2
	III	Allied Paper-2	Allied Physics Paper-2	1	4	4
	III	Allied Practical-2	Practical-2	1	2	2
	IV	Common	Value based education	1	2	2

			Sub total	8	30	26
III	I	Language	Tamil/Other Language	1	6	4
	II	Language	English	1	6	4
	III	Core-5	Electricity	1	4	4
	III	Major Practical-III	Practical-3	1	2	1
	III	Allied Subject-II	Allied Theory Paper 1	1	4	3
	III	Allied Practical-III	Allied Practical-1	1	2	1
	III	Skilled based-core	Maintenance of Electrical appliances	1	4	4
	IV	Non-Major Elective	Paper1	1	2	2
		Common	YOGA*			2
			Sub-total	8	30	23
IV	I	Language	Tamil/Other Language	1	6	4
	II	Language	English	1	6	4
	III	Core-6	Electromagnetism	1	4	4
	III	Major Practical-III	Practical-3	1	2	1
	III	Allied subject II	Allied Theory Paper-2	1	4	3
	III	Allied Practical-III	Allied Practical Paper-2	1	2	1
	III	Skilled based-core	Maintanance of Electronicappliances	1	4	4
	IV	Non-Major Elective	Paper-2	1	2	2
	V	Extension Activity	NCC/NSS/YRC/YW/PE			1
		Common	**Computer for Digital Era		2	2

			Sub-total	8	30	24
V	III	Core-7	Basic Electronics	1	4	4
	III	Core-8	Programming inC++	1	4	4
	III	Core-9	Atomic Physics	1	4	4
	III	Elective-1	Spectroscopy	1	4	4
	III	Elective-II	Communication Electronics	1	4	4
	III	Major Practical- V	Practical-V-Electronics	1	4	2
	IV	Major Practical- VI	Practical-VI-Electronics	1	4	
		Skill based common	Personality Development	1	2	2
			Sub-total	8	30	26
VI	III	Core-10	Digital Electronics	1	5	4
	III	Core-11	Nuclear Physics	1	5	4
	III	Core-12	QuantumMechanics	1	4	4
	III	Core-13	Solid state Physics	1	4	4
	III	MajorElective	Energy Physics	1	4	4
	III	Major Practical- VI I	Practical-VII-	1	4	2
	III	Major Practical- VIII	Computer Programming withC++	1	4	2
			Sub-total	7	30	24

All practical examinations are at end of each semester

*Extra credit for extra hours

Total number of hours: 180

Total number of Credits: 142

Program Outcomes, Program Specific Outcomes and Course Outcomes

Program Outcomes

PO	Upon completion of B.Sc. Degree Programme , the graduate will be able to:
PO-1	Apply the acquired scientific knowledge to face day to day needs.
PO-2	Create innovative ideas through laboratory experiments.
PO-3	Carry out field works and projects independently and in collaboration with other institution.
PO-4	Reflect upon green initiatives and take responsible steps to build a sustainable environment.
PO-5	Face challenging competitive examinations that offer rewarding careers in science and education.
PO-6	Impart communicative skills and ethical values.
PO-7	Equip students with hands on training through various courses to enhance entrepreneurship skills

Programme Specific Outcomes (PSOs)

PSO	Upon completion of B.Sc. Degree Programme , the graduate of physics will be able to:	PO
PSO-1	Apply the scientific knowledge in daily life and to develop scientific temper	PO-1
PSO-2	Develop extensive comprehension of fundamental and diverse applications of physics.	PO-2
PSO-3	Apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.	PO-3
PSO-4	Apply the critical reasoning and computing skills to analyze and solve problems in physics.	PO-5
PSO-5	Analyze the observed experimental data and relate the results with theoretical expectations.	PO-3
PSO-6	Communicate appropriately and effectively, in a scientific context using present technology.	PO-1
PSO-7	Develop entrepreneurial skills, empowered according to the professional requirement and become self- dependent.	PO-7
PSO-8	Understand the professional, ethical legal security, social issues and responsibilities.	PO-6

COURSE OUTCOMES (COs)

Semester : I Major Core-1
Name of the Course : Mechanics And Relativity
Course code : SMPH11

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Understand the fundamentals of vector Analysis.	PSO - 1	U
CO - 2	Explain the conservation laws.	PSO - 2	U
CO - 3	Understand the fundamentals of Dynamics	PSO - 4	U
CO - 4	Apply the concept of moment of inertia to objects of different shapes.	PSO - 2	A
CO - 5	Analyze the various properties of liquids. Understand the concept of Pressure and Thrust	PSO - 1	An
CO - 6	Explain the theory of Relativity	PSO - 4	U

Semester : I Major -2
Name of the Course : Properties Of Matter And Acoustics
Course code : SMPH12

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Explain the different moduli of elasticity.	PSO - 1	U
CO - 2	Explain the concept of bending of beams.	PSO - 2	U
CO - 3	Analyze the various properties of liquids.	PSO - 3	A
CO - 4	Explain Simple Harmonic motion, Musical notes and musical scale.	PSO - 2	An
CO - 5	Analyze the concept of Ultrasonic's	PSO - 1	U
CO - 6	Explain acoustics-intensity level and loudness	PSO - 4	An

Semester : I Major Practical-I
Name of the Course : Major Practical-I
Course code : SMPHP1

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Apply the theory of elasticity in determining the Young's Modulus of the given material by non-bending experiments using Pin and microscope.	PSO - 3	Ap
CO - 2	Apply the theory of elasticity in determining the Young's Modulus of the given material by bending experiments using Optic lever and Telescope	PSO - 2	Ap
CO - 3	Apply the theory of elasticity in determining the Young's Modulus of the given material by bending experiments using cantilever depression	PSO - 1,4	Ap
CO - 4	Evaluate the rigidity modulus of torsion pendulum through a simple experiment.	PSO - 2	E
CO - 5	Apply the laws of transverse vibration and estimate the frequency of A.C mains using sonometer	PSO - 7	C
CO - 6	Demonstrate the phenomena of Coefficient of viscosity by Stoke Properties of matter and acoustics' method	PSO-3	Ap
CO - 7	Evaluate the acceleration due to gravity and Moment of Inertia of compound pendulum through a simple experiment	PSO-2	An
CO - 8	Verify the laws of transverse	PSO-4	An
CO - 9	Design a record of an experiment in written form with required figures and graphs	PSO-1	C

Semester : **I Allied Physics I**
Name of the Course : **Allied Physics I**
Course code : **SAPHII**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Define Hooke's law, experimental determination of Young's modulus, rigidity modulus, deriving expression for couple per unit twist.	PSO - 1	U
CO - 2	Explain the properties and behavior of fluids under various conditions.	PSO - 2	C
CO - 3	Discuss the various types of vibrations in SHM of sound waves, determine the frequency of tuning fork.	PSO - 3	E
CO - 4	Discuss the conduction, convection and radiation phenomenon in heat transfer process.	PSO - 4	E
CO - 5	Analyse and study the application of Interference, diffraction.	PSO - 3	An

Semester : **I Allied Practical-I**
Name of the Course : **Allied Physics Practical-I**
Course code : **SAPHPI**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Apply the theory of elasticity in determining the Young's Modulus of the given material by bending experiments	PSO - 3	Ap
CO - 2	Illustrate the principle of fluid dynamics by Demonstration of experiments. (Poiseuille's method and Stoke's method)	PSO - 1,4	Ap

CO - 3	Evaluate the rigidity modulus of torsion pendulum through a simple experiment.	PSO - 2	E
CO - 4	Design a record of an experiment in written form with required figures and graphs.	PSO - 7	C
CO - 5	Demonstrate the phenomena of thermal conductivity in good and bad conductor. (Forbe's method, Lee's disc method)	PSO - 1	U
CO - 6	Analyse the diffraction and dispersion phenomena in optical elements (grating or prism) using spectrometer.	PSO - 4	An
CO - 7	Demonstrate an understanding of the scientific method and apply it in practice. (a familiarity with optics).	PSO - 3	U/An

Semester :I **Common- Environmental studies**
Name of the Course : Environmental Studies
Course code :SEVS11

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Illustrate various types of natural resources and associated problems	PSO - 1	E
CO - 2	Describe the various ecosystem, energy flow in the ecosystem, food chain, food webs and Ecological pyramids	PSO - 2	C
CO - 3	Explain Biodiversity at global, National and local levels, threats to biodiversity, endangered and endemic species of India	PSO - 3	U
CO - 4	Describe and discuss the definition, causes, effects and control measures for pollution and disaster management.	PSO - 4	C
CO - 5	Analyze social issues and the environment.	PSO - 5	An

Semester : II Major Core -3

Name of the Course : Thermal Physics and Statistical Mechanics

Course code : SMPH21

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Explain the applications of low temperature physics	PSO - 1	E
CO - 2	Recall the concept of kinetic theory of gases.	PSO - 3	R
CO - 3	Apply the laws of thermodynamics on heat phenomena.	PSO - 5	Ap
CO - 4	Correlate the concept of maxwell'sthermodynamical relations	PSO - 2	An
CO - 5	Discuss the concept of BE,MB and FD statistics	PSO - 6	U

Semester : II

Major Core- 4

Name of the Course : Optics

Course code : SMPH22

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Explain the fundamental principle of optics.	PSO - 1	U
CO - 2	Determine the behavior of a ray at any optical surface (lenses, Prisms).	PSO - 6	E
CO - 3	Explain the types of waves and its characteristics.	PSO - 2	U
CO - 4	Analyze the intensity variation of light due to polarization, interference and diffraction.	PSO - 3	An
CO - 5	Distinguish Interference, diffraction and polarization.	PSO - 2	An
CO - 6	Test the optical plainness of any optical surface.	PSO - 6	C

CO - 7	Measure the various optical parameters. (Focal length, power, refractive index, radius of curvature, dispersive power etc) using optical components (prism, lenses, glass plate, grating).	PSO - 4	E
CO - 8	Understand the interference and diffraction from wave optics concepts and know its applications. Understand polarization of light and its applications.	PSO - 1	U

Semester : II Major practical-II

Name of the Course : Major Practical-II

Course code : SMPHP2

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Demonstrate the experimental techniques and develop competence in handling optical instruments.	PSO - 1	U
CO - 2	Demonstrate an understanding of the scientific method and apply it in practice. (a familiarity with optics).	PSO - 3	U/An
CO - 3	Analyse the diffraction and dispersion phenomena in optical elements (grating or prism) using spectrometer.	PSO - 4	An
CO - 4	Measure the various optical parameters (, dispersive power, refractive index, radius of curvature, minimum deviation etc) using optical elements. (prism and grating).	PSO – 5,7	E
CO - 5	Develop practical hands-on experience applying widely used techniques to investigate optical phenomena. (oblique incidence, Normal Incidence)	PSO - 2	Ap
CO - 6	Demonstrate the phenomena of thermal conductivity in bad conductor. (, Lee’s disc method)	PSO - 6	C
CO-7	Demonstrate the phenomena of specific heat capacity of a liquid (, Newton’s law of cooling method)	PSO-8	C

Semester :IIAllied Physics -II

Name of the Course : Allied Physics II

Course code :SAPH21

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Define; discuss the Ohms law, Kirchhoff's laws, Wheatstone's bridge.	PSO - 1	C
CO - 2	Explain the fundamental concepts of electromagnetism and apply it to determine the mutual inductance	PSO - 2	R
CO - 3	Understand the basic ideas in diodes and transistors	PSO - 3	E
CO - 4	Apply Kirchhoff's laws to simple electrical circuits	PSO - 2	U,Ap
CO - 5	Understand the basics about the Nucleus	PSO - 4	C
CO - 6	Describe and discuss the frame of reference, transformation equations	PSO - 5	E

Semester :IIAllied Physics Practical-II

Name of the Course : Allied Physics Practical-II

Course code :SMPHP2

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Understand the basic principles of Physics through experiments	PSO - 1	U
CO - 2	Understand the practical knowledge of various bridges (Desauty's and Owen's bridge) by demonstration of experiments	PSO - 1	U
CO - 3	Determine the resonant frequency and Q value of a series and parallel LCR circuit	PSO - 2	Ev

CO - 4	Understand the principle and working of analog electronic circuits (Zener diode, Bridge rectifier) through some basic experiments	PSO - 1	U
CO - 5	Develop the basic experiments; improve basic skills and attitude which help them to apply these skills in their field of physics.	PSO - 2	U
CO - 6	Analyze the characteristics and various applications of the Transistor	PSO - 2	An

Semester :II

Common-Value based education

Name of the Course :Value Based Education

Course code :SVBE21

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Defining, explaining the need, factors responsible for social injustice discuss the contributions of social reformers.	PSO - 1	E
CO - 2	Discuss the Rights of women, children, Dalit's, minorities, physically challenged	PSO - 1	C
CO - 3	Understand the social issues, separation of religion from politics.	PSO - 2	U
CO - 4	Know about the media, globalization, new media	PSO - 4	C
CO - 5	Analyze personal, family, social, cultural, professional values. And thereby knowing duties and responsibilities	PSO - 5	An

Semester :III

Major Core- 5

Name of the Course : Electricity

Course code :SMPH31

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO-1	Explain the concepts and features of the electrostatic force(Coulomb force), the electric force field, Gauss's Law and its application(charged sphere , cylinder, plane sheet)	PSO-3	U
CO-2	Analyze the presence of electric potential and potential difference, within a frame work of distributed symmetric charge distributions.	PSO-3	C
CO-3	Describe the various effects of thermo electricity and explain the thermo electric diagram	PSO-4	U
CO-4	Explain the theories and Experiments related to chemical effects of electrolysis. Apply Kirchhoff's laws and network theorems to electrical circuits.	PSO-2	C
CO-5	Analyze AC circuit behavior (LR, CR LCR).Discuss AC bridges and BG to do electrical measurements.	PSO-4	U

Semester : III

Major practical-III

Name of the Course : Practical-3

Course code : SMPHP3

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO-1	Demonstrate the experimental techniques and develop competence in handling instruments.	PSO-1	U
CO-2	Demonstrate an understanding of the scientific method and apply it in practice. (a familiarity with Electricity and magnetism).	PSO-3	Ap
CO-3	Organize and present the performed experiments in graphical format(calibration of voltmeter using Potentiometer)	PSO-7	C
CO-4	Analyze AC circuit behavior. (LCR series and De sauty's bridge)	PSO-5	An
CO-5	Determine magnetic dipole moment using Vibration magnetometers and AC bridges, and Ballistic galvanometer to do electrical measurements.	PSO-5	E

Semester : III Skilled based-core
Name of the Course: Maintenance of Electrical Appliances.
Course code : SMPH3A

CO-1	Understand the basic principles involved in electric appliances. (transducer ,electric bulb, multimeter, transformer)	PSO-1	U
CO-2	Examine the working of electric fan ,pixie, grinder, refrigerator)	PSO-2	An
CO-3	Explain the consumption of electrical power by various electrical appliances	PSO--3	E
CO-4	Analyze the different types of switches and transformers-	PSO-5	An
CO-5	Design simple electrical circuits using different types of switches	PSO-7	C
CO-6	Analyze the characteristics of various house wiring , Inverter, UPS)	PSO-2.	An

Semester : IVMajor Core- 6

Name of the Course: Electromagnetism
Course code : SMPH41

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO-1	Understand laws of electromagnetic induction as applied to self and mutual induction	PSO-3	U
CO-2	Explain the concepts of Ampere’s circuital law and analyze the effect of uniform magnetic fields on moving charges and current- carrying wires, loops and magnetic dipoles	PSO-3	C
CO-3	Analyze Maxwell’s equation. Explain B-H curve and pointing vector. Explain Hertz experiment for production and detection of EM wave	PSO-4	U,E
CO-4	Develop wave equations for electric field and magnetic field. Explain impedance and velocity of E M wave	PSO-4	C

CO-5	Explain the operation and various uses of Earth inductor. Discuss the practical application of Electromagnetism(induction coil)	PSO-2	U
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Semester : IV Skilled based-core

**Name of the Course : Skill Based Elective
(Maintenance of Electronic Appliances)**

Course code : SMPH4A

CO	Upon completion of the course ,students will be able to:	PSO addressed	CL
CO-1	Understand the basic scientific principles and fundamental concepts of electronic components and measuring instruments.....	PSO-2	U
CO-2	Recall various laws in Physics (Ohms law, Law in Optics, Lens law of mutual Inductance , Simple theorems in Electricity, Basic ideas about Communication Systems.)	PSO-1	R
CO-3	Identify and apply the basic principles behind different electronic instruments(Thermistor ,Photo Voltaic cells, TV modem,) and other devices (different types of Cameras)	PSO-3	Ap
CO-4	Explain safety measures while handling electric instruments, explain the importance of Communication system, working of camera.	PSO-6	E
CO-5	Elaborate the different types of antennas and explain how images are formed in a camera.	PSO-1	C

Semester : V Major Core -7
Name of the Course : Basic Electronics
Course code : SMPH51

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Analyze the circuit elements and their connections	PSO - 1	R
CO - 2	Explain the concept of voltage source and current source	PSO - 2	An
CO - 3	Understand the characteristics of semiconductor diodes and devices	PSO - 2	U
CO - 4	Explain classification of power amplifiers, transistor connections	PSO - 4	Ap
CO - 5	Analyze the characteristics of FET	PSO - 5	Ev
CO - 6	Demonstrate uses of Oscillators and wave shaping circuits	PSO - 6	U
CO - 7	Analyze the different characteristics of OP-Amp	PSO - 5	An

Semester : VMajor Core -8
Name of the Course : Computer Programming InC++
Course code : SMPH52

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO-1	Describe the principles of object oriented program. Apply object oriented programming techniques to solve computing problems.	PSO-6	Ap
CO-2	Develop programs using functions and classes. (objects, array of objects, friend functions, passing and returning objects)	PSO-4	C
CO-3	Develop programs using constructor, destructor, operator overloading and inheritance	PSO-4	C
CO-4	Formulate the applications of pointers and virtual functions. Distinguish formatted and unformatted I/O operations.	PSO-4	An

CO-5	Explain Working with File , File opening modes, File pointers and their manipulations	PSO-7	C
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Semester : VMajor Core- 9
Name of the Course : Atomic Physics
Course code : SMPH53

CO	Upon completion of the course ,students will be able to:	PSO addressed	CL
CO-1	Explain the theories and experiment related to band theory of solids , electrical and thermal conductivity of a conducting material.	PSO-1	U
CO-2	Identify wave nature experiments (Thomson's parabolic method , Rutherford experiment) and particle nature experiment (photo electric effect, planks law ,Compton effect , photo electric effect	PSO-2	AP
CO-3	Define Braggs law of X-ray diffraction	PSO-5	An
CO-4	Analyze various Atom models and various atomic spectra./	PSO-5	An
CO-5	Solve the mathematical expression for electrical and thermal conductivity of different conducting materials.	PSO-4	C
CO-6	Explain the principle , construction and operation of different particle detectors.	PSO-5.	E

Semester : VMajor Elective-1
Name of the course : Spectroscopy
Course code : SEPH5B

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Explain the classification of molecules, rigid & non-rigid rotators, chemical analysis by microwave spectroscopy.	PSO - 1	U
CO - 2	Discuss simple harmonic, unharmonic oscillators, Diatomic rotator, analysis by IR spectroscopy	PSO - 2	C

CO - 3	Describe and discuss the Classical, Quantum theories of Raman effect, polarization of light, Structure determination from IR and Raman spectroscopy	PSO - 3	E
CO - 4	Illustrate Oppenheimer approximation, Frank-Condon principle, dissociation, predissociation in electronic vibration transitions	PSO - 4	E
CO - 5	Describe IR instrumentation and techniques.	PSO - 5	U

Semester : VMajor Elective-2
Name of the Course : Communication Electronics
Course code : SEPH5C

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Understand the basic ideas regarding amplitude modulation and transmission in communication system.	PSO - 1	R, U
CO - 2	Understand the Reception in amplitude modulation and explain its detection.	PSO - 4	U, E
CO - 3	Understand the frequency and pulse modulation and explain its detection	PSO - 7	Ap
CO - 4	Develop the ideas in Frequency modulation Reception.	PSO - 6	C
CO - 5	Apply the technical skills and modern tools in Digital modulation techniques in communication systems.	PSO - 3	Ap

Semester : V Skill based common
Name of the Course : Personality Development
Course code : SCSB5A

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Understand the importance of personality development, and try to achieve effective goal setting in life .	PSO -	R, U
CO - 2	Explain the advantages and disadvantages of self monitoring, and job performance.	PSO -	U, E
CO - 3	Apply assertiveness in communication and attitude change	PSO -	Ap
CO - 4	Define leadership skills and negotiation skills. Compare types of negotiations.	PSO -	C
CO - 5	Illustrate how to develop emotional quotient and attain stress management.	PSO -	Ap

Semester : V Major practical-V
Name of the Course : Non-Electronics Practical
Course code : SMPHP5

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Demonstrate the experimental techniques and develop competence in handling optical instruments.	PSO - 1	U
CO - 2	Demonstrate an understanding of the scientific method and apply it in practice. (a familiarity with optics).	PSO - 3	U/An
CO - 3	Analyze the diffraction and dispersion phenomena in optical elements (grating or prism) using spectrometer.	PSO - 4	An
CO - 4	Develop practical hands-on experience applying widely used techniques to investigate optical phenomena. (i – d curve)	PSO – 5,7	E
CO - 5	Understand the theory of Ballistic galvanometer by doing experiments	PSO - 2	Ap

CO - 6	verify the Thevinins and Norton theorem	PSO - 6	C
CO - 7	Compile a record of an experiment in a clear and logical written form (e.g., lab manual report, Record) augmented with figures and graphs where appropriate.	PSO - 5	C

Semester : V Major practical-VI
Name of the Course:Electronics Practical
Course code : SMPHP5,SMPHP7

CO	Upon completion of the course ,students will be able to:	PSO addressed	CL
CO-1	Develop knowledge and skills relating to electronics through hands –on learning experiences	PSO-4	AP
CO-2	Understand the fundamental concepts and mechanisms used in Digital electronics (logic gates and flip- flops)	PSO-2	U
CO-3	Design and analyze digital systems/ logical circuits	PSO-5	An/E
CO-4	Analyze and design various combinational and sequential circuits	PSO-3	An/U
CO-5	Infer the operation of basic logic gates ,understand Boolean algebra and simplify simple function by using basic Boolean properties	PSO-6	Ap

Semester : VMajor Core- 10
Name of the course : Digital Electronics
Course code : SMPH61

Semester : VI Major Core -11
 Name of the Course : Quantum Mechanics
 Course code : SMPH62

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO-1	Understand the fundamental concepts and techniques used in Digital Electronics. Perform conversions among different number systems.	PSO-2,4	U, Ap
CO-2	Infer the basic logic gates, understand Boolean algebra and simplify simple Boolean functions by using basic Boolean properties.	PSO-1	U
CO-3	Explain arithmetic circuits (Half and Full adders), Flip-Flops(RS,JK, JK MASTER-SLAVE, D,T) and Multivibrators.	PSO-4	C
CO-4	Identify and apply appropriate techniques and to solve problems in Karnaugh Map.	PSO-7	Ap
CO-5	Understand, analyse and design various combinational and sequential circuits. (Registers, Counters, MUX, DEMUX, Encoder, Decoder etc.) A/D and D/A, Conversion.	PSO-5	Ap
CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Explain the development of Quantum mechanics.	PSO - 4	U
CO - 2	Analyze the wave properties of matter.	PSO - 4	E
CO - 3	Illustrate Heisenberg's uncertainty Principle.	PSO - 2	C

CO - 4	Explain physical interpretation of wave function and Schrodinger wave equation	PSO - 5	C
CO - 5	Understand the applications of Quantum mechanics	PSO - 6	U

Semester: VIMajor Core - 12

Name of the Cours: Nuclear Physics

Course code :SMPH63

CO	Upon completion of the course ,students will be able to:	PSO addressed	CL
CO-1	Define the fundamentals of nuclear matter (properties of nucleus and nuclear forces)	PSO-2	R
CO-2	Apply the principles of physics in the measurement of Nuclear size ,nuclear spin, nuclear energy levels and nuclear magnetic moment.	PSO-2	Ap
CO-3	Assess radioactivity and various nuclear reactions(nuclear fission and fusion)	PSO-3	E
CO-4	Explain the decay modes, Radiation detectors and particle accelerators(Ionization chamber, GM conter,Linear accelerators, Cyclotron, Synchro cyclotron ,Betatron)	PSO-5	U
CO-5	Discuss the classification of elementary particles and their fundamental interaction.	PSO-5	An
CO-6	Analyze the characteristics and behavior of elementary particles and their fundamental interactions.	PSO-7	U
CO-7	Develop a deeper understanding of some important applications of Nuclear Reactor and source of Stellar energy.	PSO-4	C

Semester : VIMajor Core -13

Name of the course : Solid State Physics

Course code : SMPH64

CO	Upon completion of this course, students will be able to:	PSO addressed	CL

CO - 1	Illustrate various crystal structures	PSO - 1	U
CO - 1	Understand the basic ideas of constructing reciprocal lattices to SC, BCC & FCC lattices	PSO - 1	C
CO - 2	Discuss the various theories involved in magnetic materials (dia,para,ferro,ferri and antiferro magnetism)	PSO – 2	E
CO - 2	Describe polarization process and Dielectric loss of dielectric medium	PSO - 2	E
CO - 3	Illustrate various types of bonding present in solids with example	PSO - 3	U
CO - 4	Describe and discuss the theory of superconductivity and superconducting materials	PSO - 4	R
CO - 5	Understand the basic ideas of nanomaterial, their properties, applications .	PSO - 5	U

Semester : VI

Major Elective-I (b)

Name of the Course : Energy Physics

Course code : SCPH6B

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Understand the utilization of solar energy for generating the power.	PSO - 8	Ap
CO - 2	Apply the solar energy in various sectors. (industry, agriculture and domestic purposes)	PSO - 3	Ap
CO - 3	Explain the basic principles of wind energy conversion, its components and its classification.	PSO - 1	U
CO - 4	Explain the various Biomass conversion Processes.	PSO - 7	U

Semester : V and VI Major practical-VII
Name of the Course : Non Electronics Practical (V Sem)
And General Practical (Vi Sem)
Course code :SMPHP7

CO	Upon completion of the course ,students will be able to:	PSO addressed	CL
CO-1	Demonstrate the experiment techniques and develop competence in handling optical instruments.	PSO-1	U
CO-2	Demonstrate an understanding of the scientific method and apply it in practice.	PSO-3	U/An
CO-3	Analyze the diffraction and dispersion phenomena in optical elements (grating and prism) using spectrometer.	PSO-4	An
CO-4	Measure the various optical parameters using optical instruments(prism and grating)	PSO-5,7	E
CO-5	Develop practical hands –on experience applying widely used techniques to investigate optical phenomena (i-d curve ,hyperbolic fringes, elliptical fringes)	PSO-2	AP
CO-6	Record analyze, interpret and critically evaluate Cauchy's constant and Hartmann interpolation formula experimentally	PSO-6	C

Semester : VI Major practical-VIII
Name of the Course : Computer Practical Programming In C++
Course code : SMPHP8

CO	Upon completion of the course ,students will be able to:	PSO addressed	CL
CO-1	Understand the principles of OOP to construct computer programs and modeling experimental data for the solution of problems in physics (period of a pendulum and young's modulus of a material)	PSO-1	U
CO-2	Apply OOP techniques to solve computing problems (+, - ,* , /)	PSO-3	AP
CO-3	Develop programs using function and classes.	PSO-2	Ap/C
CO-4	Formulate the applications of pointers and virtual functions. Distinguish formatted and unformatted I/Applications.	PSO-6	E
CO-5	Develop programs using constructor, destructor, operator overloading and inheritance.	PSO-4	C
CO-6	Analyze the concepts trained in the computer lab activities and provide an understanding of data acquisition and analysis.	PSO-5	An

U- Understand

R- Remember

E- Evaluate

Ap- Apply

An- Analyse

C- Create