	Department of Physics											
1.1.1	1.1.1 Curricula developed and implemented have relevance to the local/ national / regional and global developmental needs which are reflected in Programme Outcomes (PSOs) and Course Outcomes (COs) of various programmes offered by the Institution											
S. No.	Course Code	Name of the Course	L	N	I R	2 0	;	POs, PSOs, COs Addressed				
							POs	PSOs	COs			
								2023-2024				
1	PU231CC1	Core Course I: Properties of Matter and Acoustics	Q				PO 1 - To obtain comprehensive knowledge and skills to pursue higher studies in the relevant field of science. PO 2 - To create innovative ideas to enhance entrepreneurial skills for economic independence.	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact, apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To analyze the observed experimental data and relate the results with theoretical expectations. Communicate appropriately and effectively, in a scientific context using present technology.	CO 1 - To relate elastic behavior in terms of three modulii of elasticity and working of torsion pendulum. CO 2 - To appreciate concept of bending of beams and analyze the expression, quantify and understand nature of materials. CO 3 - To explain the surface tension and viscosity of fluid and support the interesting phenomena associated with liquid surface, soap films provide an analogue solution to many engineering problems. CO 4 - To analyze simple harmonic motions mathematically and apply them.			
2	PU231CP1	Core Lab Course I: General Physics Lab I		V	2		PO 1 - To obtain comprehensive knowledge and skills to pursue higher studies in the relevant field of science. PO 2 - To create innovative ideas to enhance entrepreneurial skills for economic independence.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and tiverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact, apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To analyze the observed experimental data and relate the results with theoretical expectations. Communicate appropriately and effectively, in a scientific context using present technology.	CO 1 - To understand the strength of material using Young's modulus. CO 2 - To acquire knowledge of thermal behaviour of the materials. CO 3 - To analyze the physical principle involved in the various instruments . CO 4 - To understand the scientific method and an ability to apply the scientific method in practice.			
3	PU231EC1	Elective Course I: Allied Physics for Mathematics – 1			2	6	PO 1 - To obtain comprehensive knowledge and skills to pursue higher studies in the relevant field of science. PO 2 - To create innovative ideas to enhance entrepreneurial skills for economic independence.	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact, apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To analyze the observed experimental data and relate the results with theoretical expectations. Communicate appropriately and effectively, in a scientific context using present technology.	CO 1 - To acquire knowledge on elementary ideas of waves, properties of matter, electricity, magnetismand electronics. CO 2 - To analyze the concepts of ultrasonics, surface tension and study their applications in the medical field. CO 3 - To interpret the real life solution using concepts of electricity, magnetism, and electronics in digital India. CO 4 - To apply their depth knowledge of Physics in day today life develop their knowledge to carry out the practical by applying these concepts of Physics.			
4	PU231EP1	Elective Lab Course I:Allied Physics Practical for Mathematics – I			2		PO 1 - To obtain comprehensive knowledge and skills to pursue higher studies in the relevant field of science. PO 2 - To create innovative ideas to enhance entrepreneurial skills for economic independence.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact, apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To analyze the observed experimental data and relate the results with theoretical expectations. Communicate appropriately and effectively, in a scientific context using present technology.	CO 1 - To understand the basic principles of Physics through experiments. CO 2 - To measure and determine the various physical parameters. CO 3 - To develop an idea about the handling of various instruments. CO 4 - To get an idea about basic scientific knowledge and implications of its broad working principle.			
5	PU231NM1	Non-Major Elective NME-I: Physics for Everyday Life				2	PO 1 - To obtain comprehensive knowledge and skills to pursue higher studies in the relevant field of science - PO 2 - To create innovative ideas to enhance entrepreneurial skills for economic independence.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact, apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To analyze the observed experimental data and relate the results with theoretical expectations. Communicate appropriately and effectively, in a scientific context using present technology.	CO 1 - To understand the knowledge of basic scientific principles and fundamental concepts in motion of bodies. CO 2 - To understand the basic laws of Physics in domestic appliances. CO 3 - To recall the Physics notions applied in various optical instruments. CO 4 - To comprehend the utilization of solar energy in everyday life activities. CO 5 - To know about the various physicists contribution towards science and technology.			
6	PU231FC1	Foundation Course: Introductory Physics			2		PO 1 - To obtain comprehensive knowledge and skills to pursue higher studies in the relevant field of science . PO 2 - To create innovative ideas to enhance entrepreneurial skills for economic independence.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact, apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To analyze the observed experimental data and relate the results with theoretical expectations. Communicate appropriately and effectively, in a scientific context using present technology.	CO 1 - To apply concept of vectors to understand concepts of Physics and solve problems. CO 2 - To interpret different forces present in Nature while learning about phenomena related to these different forces. CO 3 - To describe energy in different process and relate momentum, velocity and energy. CO 4 - To differentiate different types of motions they would encounter in various courses and understand their basis. CO 5 - To relate various propriets of matter with their behavior and connect them with different physical parameters involved.			
7	PU232CC1	Core Course II: Heat, Thermodynamics and Statistical Physics				26	PO 1 - To obtain comprehensive knowledge and skills to pursue higher studies in the relevant field of science. PO 2 - To create innovative ideas to enhance entrepreneurial skills for economic independence.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact, apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To analyze the observed experimental data and relate the results with theoretical expectations. Communicate appropriately and effectively, in a scientific context using present technology.	CO 1 - To acquires knowledge on how to distinguish between temperature and heat, and explain practical measurements of high temperature as well as low temperature Physics. CO 2 - To derive the efficiency of carnot's engine and discuss the implications of the laws of thermodynamics in diesel and petrol engines. CO 3 - To analyze performance of thermodynamic systems viz efficiency by problems and gets an insight into thermodynamic properties like enthalpy, entropy. CO 4 - To study the process of thermal conductivity and apply it to good and bad conductors.			
8	PU232CP1	Core Lab Course II: General Physics Lab II			2		PO 1 - To obtain comprehensive knowledge and skills to pursue higher studies in the relevant field of science . PO 2 - To create innovative ideas to enhance entrepreneurial skills for economic independence.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and tiverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact, apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To analyze the observed experimental data and relate the results with theoretical expectations. Communicate appropriately and effectively, in a scientific context using present technology.	CO 1 - To understand the strength of materials using physical experiments. CO 2 - To acquire knowledge of thermal behaviour of the materials. CO 3 - To analyze the physical principle involved in the various instruments such as sonometer and melde's string. CO 4 - To understand the scientific method and an ability to apply the scientific method in practice.			

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9	PU232EC1	L'iective Course II: Allied Physics for Mathematics – II Elective Lab Course I:			1	JPU 1 - To obtain comprehensive knowledge and skills to pursue higher studies in the relevant field of science . PO 2 - To create innovative ideas to enhance entrepreneurial skills for economic independence. PO 1 - To obtain comprehensive knowledge and	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact, apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To analyze the observed experimental data and relate the results with theoretical expectations. Communicate appropriately and effectively, in a scientific context using present technology. PSO 1 - To understand the core theories and principles of Physics which	CU 1 - To explain the concepts of interference, diffraction and rephrase the concept of polarization. CO 2 - To outline the basic foundation of different atom models and relate the importance of theoretical models. CO 3 - To understand the properties of nuclei, nuclear forces, structure of atomic nucleus and nuclear models and interpret nuclear processes like fission and fusion. CO 4 - To describe the basic concepts of relativity like equivalence principle, inertial frames and lorentz transformation. CO 5 - To summarize the working of semiconductor devices like diodes, transistors, chargers and charging stations. CO 1 - To understand the nature of monchromatic liebt and its
10	1025241	for Mathematics – II				101-10 John Control (1997) A start of the relevant field of science . PO 2 - To create innovative ideas to enhance entrepreneurial skills for economic independence.	130 1 - 10 that and use the three and principles of triplets which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact, apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To analyze the observed experimental data and relate the results with theoretical expectations. Communicate appropriately and effectively, in a scientific context using present technology.	CO 1 - 10 outer stand the narree of monocurronmer near and its diffraction and interference phenomenon. CO 2 - To able to design simple logic circuits. CO 3 - To analyze the physical principle involved in the various instruments. CO 4 - To understand the scientific method and an ability to apply the scientific method in practice.
11	PU232NM1	Non-major Elective NME-II: Physics of Music		V		PO 1 - To obtain comprehensive knowledge and skills to pursue higher studies in the relevant field of science . PO 2 - To create innovative ideas to enhance entrepreneurial skills for economic independence.	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact, apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To analyze the observed experimental data and relate the results with theoretical expectations. Communicate appropriately and effectively, in a scientific context using present technology.	CO 1 - To understand the principles and basic scientific concepts in sound waves. CO 2 - To understand the various phenomena of simple vibrating systems. CO 3 - To comprehend the various musical notes and its production. CO 4 - To apply the knowledge of recording music in day to day life activities. CO 5 - To know the scientific concepts of music.
12	PU2328E1	Skill Enhancement Course SEC I: Digital Photography			2	PO 1-To obtain comprehensive knowledge and skills to pursue higher studies in the relevant field of science - PO 2 - To create innovative ideas to enhance entrepreneurial skills for economic independence.	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2- To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3- To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact, apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 4- To analyze the observed experimental data and relate the results with theoretical expectations. Communicate appropriately and effectively, in a scientific context using present technology.	CO 1 - To describe the principle of image formation in photography. CO 2 - To apply the parameters for controlling the images. CO 3 - To identify different types of camera . CO 4 - To explain the image formation in digital photography. CO 5 - To illustrate the digital image – postproduction procedures.
13	PC2031	Major Core III – Heat and Thermodynamics)) [2]		[PO 1- To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2- To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4- To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand experimental methods to determine the transmission of heat. CO 2 - To analyze the work and heat interactions associated with a prescribed process path and to perform a analysis of a flow system. CO 3 - To understand the basic concepts of thermodynamics like system, properties, equilibrium, pressure, specific volume, temperature and the laws of thermodynamics. CO 4 - To evaluate entropy changes in a wide range of processes and determine the reversibility or irreversibility of a process from such calculations. CO 5 - To analyze maxwell's thermo dynamical relations and their
14	PC2032	Major – Elective - I a) Non Conventional Energy Sources				 PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 4 - To reflect upon green initiatives and take responsible steps to build a sustainable. 	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply showledge of principles, concepts in Physics and analyze their loycal, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To apply the solar energy in various sectors. CO 2 - To explain the basic principles of wind energy conversion, various biomass conversion processes and its classification. CO 3 - To discuss the geothermal energy resources and chemical energy resources. (fuel cells). CO 4 - To solve the present and future energy crisis.
15	PC2033	Major – Elective - I b) Fundamentals of Physics - I				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the fundamentals of dynamics. CO 2 - To determine the behavior of a ray at any optical surface (lenses, Prisms). CO 3 - To outline the extraction of useful energy from earth, ocean, wind and sun. CO 4 - To determine the significance of steady current and alternating current. CO 5 - To apply Kirchoff's laws to simple electrical circuits.
16	PC2034	Major – Elective - I c) Microprocessor Fundamentals				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To know the basic ideas on microprocessor, memory and I/O devices. CO 2 - To be familiar with the basic concepts of microprocessor architecture and interfacing. CO 3 - To acquire skills in the programming instruction sets of microprocessors. CO 4 - To apply the programming instructions to perform simple programs using microprocessor. CO 5 - To apply kirchoff's laws to simple electrical circuits.
17	AP2031	Allied I – Allied Physics I for Chemistry		0		PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze their toalyze the toescure the results with theoretical expectations.	CO 1 - To understand to know, various modulus involved in the materials, flow of liquids due to viscous forces, transmission of heat due to process of conduction, convection and radiation and various laws involved in heat transformation, various thermodynamic laws. CO 2 - To analyze the concepts and study the concept of entropy, and the phenomenon like interference and diffraction, optical activity of liquids and its uses. CO 3 - To apply their depth knowledge of Physics in day today life.

18	PC20S1	Self Learning Course -		1		PO 1 - To apply the acquired scientific knowledge	PSO 1 - To understand the core theories and principles of Physics which	CO 1 - To recall the principles of mechanics and conservation
		Physics for Competitive Examination – I	-			To receive the advanced activities into the end of the end of the one of the end of the	include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	laws. CO 2 - To understand the concept of fluid dynamics. CO 3 - To categorize different kinds of oscillations. CO 4 - To examine the various aberrations and geometry involved in optics. CO 5 - To apply the laws of thermodynamics on heat phenomena.
19	PC2041	Major Core IV – Optics and Spectroscopy		3		PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the knowledge of geometric optics is helps in the practical design of many optical systems and instruments including aberrations in lens system. CO 2 - To determine the behavior of a ray and wave at any optical surface. CO 3 - To analyze the intensity variation of light due to polarization, interference and diffraction. CO 4 - To study of phenomena interference, diffraction, and polarization lays the foundation for an understanding of concepts such as holograms, interferenceters.
20	PC2042	Major – Elective - II a) Computer Programming in C++			N	PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the different types of operators and expressions in C++ language. CO 2 - To implement different operation an arrays and use function to solve the given problem. CO 3 - To understand member functions and constructors. CO 4 - To analyze pointers, operator overloading and inheritance. CO 5 - To analyze input/output operations.
21	PC2043	Major – Elective - II b) Medical Physics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To nanlyze their beysics.PSO 5 - To nanlyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the anatomical terms of the body. CO 2 - To explain the physical dynamics of the body. CO 3 - To analyse the heat and pressure system of the body. CO 4 - To discuss the optical and electrical behavior of the human body. CO 5 - To gain knowledge and application ideas regarding diagnostic systems.
22	PC2044	Major – Elective - II c) Optoelectronics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To nanlyze their localyze the results with theoretical expectations.	CO 1 - To explain the various methods of propagation of light waves through various types of fibres. CO 2 - To understand the basic concepts of fiber optics and types of fibers. CO 3 - To explain the structure and performance of LED's and lasers. CO 4 - To classify the optical sources and detectors and to discuss their principle. CO 5 - To discuss the channel impairments such as losses and dispersion.
23	AP2041	Allied II – Allied Physics II for Chemistry				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	$CO \ 1 - To acquire knowledge on elementary ideas of electricity and magnetism, electronics, atomic and nuclear Physics . CO 2 - To analyze the concepts and study their applications in the field of electricity and magnetism, electronics and nuclear Physics. CO 3 - To apply their depth knowledge of Physics in day today life. CO 4 - To develop their knowledge and carry out the practical by applying the concepts of a rectifier, amplifiers and oscillator, basic digital electronics principles through logic gates and the laws governing them.$
24	PC20P2	Major Practical II - Physics Lab II				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the scientific method and an ability to apply the scientific method in practice. CO 2 - To recall the basic experiments; improve the basic skills and atitude which help them to apply these skills in their field of Physics. CO 3 - To understand the practical knowledge of various bridges (desauty's and owen's bridge) by demonstration of experiments. CO 4 - To verify the thevenins and nortons theorem. CO 5 - To 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. CO 6 - To analyze the physical principle involved in the various
25	AP20P1	Allied Practical – General Physics Lab				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze their locarcy the results with theoretical expectations.	CO 1 - To understand the basic principles of Physics through experiments. CO 2 - To measure and determine the various physical parameters. CO 3 - To develop an idea about the handling of various instruments. CO 4 - To get an idea about basic scientific knowledge and implications of its broad working principle. CO 5 - To analyze, interpret and evaluate data. CO 6 - To build a foundation in scientific career.
26	PC20S2	Self Learning Course: Physics for Competitive Examination – II		1		PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. PO 7 - To equip students with hands on training through various courses to enhance	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To discuss the principles and generation of electric charges. CO 2 - To classify the different types of magnetic materials. CO 3 - To correlate the mechanisms involved between magnetism and electricity. CO 4 - To discuss the principles behind the phenomena of atomic Physics and nuclear reactions. CO 5 - To apply the laws of thermodynamics on heat phenomena. CO 6 - To differentiate metals, conductors and insulators. CO 7 - To recognize the elements of microprocessors and computers.
27	PC2051	Major Core V – Classical and Statistical Mechanics				JPU 1- To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CU 1 - To understand the basic mechanical concepts related to system of particles. CO 2 - To apply various mechanical principles to find solution for physical problem. CO 3 - To solve the equations of motion using hamiltonian formalism. CO 4 - To explain the fundamental postulates of statistical mechanics and maxwell boltzmann statistics. CO 5 - To understand and develop a scientific knowledge in quantum statistics.

28	PC2052	Major Core VI - Analog Electronics				 PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. 	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the fundamental principles of semiconductors including p-n junctions and zener diode. CO 2 - To illustrate network theorems like thevenin's theorem, norton's theorem. CO 3 - To analyze the operation of transistor , amplifier, oscillator and multivibrator. CO 4 - To demonstrate practical skills in the simulation, construction and testing of simple electrical and electronic circuits. CO 5 - To understand and develop a scientific knowledge in
29	PC2053	Major Core VII - Solid State Physics			V	 PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. 	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To illustrate various types of bonding present in solids with example. CO 2 - To explain the various crystal parameters and structures. CO 3 - To discuss the various theories involved in magnetic materials. (dia, para, ferro, ferri and antiferro magnetism). CO 4 - To describe polarization processes and analyze the information contained in the temperature and frequency dependence of dielectric materials. CO 5 - To analyze the structure and physical properties of semiconductors.
30	PC20PR	Research Project	V			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To explore new areas of research in Physics. CO 2 - To analyze a research problem and construct tools for data collection. CO 3 - To write research reports and present results in the scientific community. CO 4 - To develop skills to serve in science related industries and agencies.
31	PC2061	Major Core VIII – Relativity and Quantum Mechanics			0	PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To nanlyze their observed experimental data and relate the results with theoretical expectations.	CO 1 - To gain knowledge in the concepts of special and theory of relativity. CO 2 - To evolve ideas about dual nature of matter. CO 3 - To recognize basic terms in quantum mechanics and different operator mechanism. CO 4 - To apply of schrödinger's equation to micro system.
32	PC2062	Major Core IX – Digital and Communication Electronics		D	C	PO 1- To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the basic operation, and features related to logic gates and interprets their applications. CO 2 - To acquire knowledge on number system, arithmetic building blocks, and memories. CO 3 - To understand the fundamental concepts of logic gates, counters, registers, fiber optics. CO 4 - To develop skill to build and troubleshoot combinational digital circuits. CO 5 - To understand AM, FM and PM modulation and demodulation techniques. CO 6 - To analyze the concepts trained in the computer lab activities and provide an understanding of data acquisition and analysis assess the basic concepts of fiber optics and types of fiber diodes, transistor, on-ambs and converters.
33	PC2063	Major Core X - Nuclear Physics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the basics of nuclear Physics that treats atomic nuclei as self-bound many-body quantum systems. CO 2 - To acquire knowledge about particle- antiparticle, decay processes and their outcomes. CO 3 - To basic interaction between fundamental particles.
34	PC2064	Major – Elective – III a) Mathematical Physics			Σ	 PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. 	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze their observed experimental data and relate the results with theoretical expectations.	CO 1 - To illustrate linear dependence and combination of vectors as quantities in Physics. CO 2 - To solve ordinary and partial differential equations related to physical science. CO 3 - To evaluate problems in matrices. CO 4 - To adapt laplace transform technique to obtain the laplace series of periodic functions of Physics. CO 5 - To understand and manipulate random variables using the theory of probability including tools of probability transformation and characteristic functions.
35	PC2065	Major – Elective – III b) NanoPhysics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To nanlyze their observed experimental data and relate the results with theoretical expectations.	CO 1 - To infer the history of nanotechnology and explain the synthesis of nanomaterials. CO 2 - To interpret quantum well, quantum wires and quantum dots. CO 3 - To explain the carbon nanotubes and its applications. CO 4 - To discuss the applications of nanotechnology in various fields.
36	PC2066	Major – Elective – III c) AstroPhysics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To perceive the historical evolution of solar system and planets. CO 2 - To describe the principles of Physics in the formation of astronomical objects like planets-satellites - asteroids and comets. CO 3 - To examine the requirements and limitations of instrumentation for modern astrophysical observations (optical telescopes and radio telescopes). CO 4 - To analyse the formation of stars, pulsars, neutron stars and black holes. CO 5 - To interpret the observations of galaxies, star clusters, galactic clusters.

27	DC20D2	Major Practical III	1	T	PO 1 To apply the acquired scientific knowledge	PSO 1 To understand the core theories and principles of Physics which	CO 1 To domonstrate the experimental techniques and develop
37	PC20P3	Major Fractica III - Physics Lab III			 FO 1 = 10 apply in eacquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills. 	FSO 1 - 10 understand the core meotres and principles of raysics which include mechanista, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 = 10 demonstrate the experimental techniques and develop competence in handling optical instruments. CO 2 - To analyze the diffraction and dispersion phenomena in optical elements (grating or prism) using spectrometer. CO 3 - To develop practical hands-on experience applying widely used techniques to investigate optical phenomena. (Oblique incidence, i-d curve). CO 4 - To record, analyze, interpret and critically evaluate cauchy's constant and hartmann's interpolation formula experimentally.
38	PC20P4	Major Practical IV - Physics Lab IV			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the ioserved experimental data and relate the results with theoretical expectations.	CO 1 - To develop knowledge and skills relating to electricity and electronics through hands-on learning experience. CO 2 - To understand the fundamental concepts and mechanisms used in digital electronics. (logic gates and flip – flops). CO 3 - To design and analyse digital systems / logical circuits.(de morgans theorems using IC). CO 4 - To analyse and design various combinational and sequential circuits.(flip flop, encoder, decoder, op-amp etc.). CO 5 - To infer the operation of basic logic gates, understand boolean algebra and simplify simple boolean functions by using
39	PC20P5	Major Practical V - Physics Lab V			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the principles of object oriented program to construct computer programs and modeling of experimental data for the solution of problems in Physics (period of a pendulum and Young's modulus of a material). CO 2 - To apply object oriented programming techniques to solve computing problems (addition, subtraction, multiplication and division). CO 3 - To develop programs using functions and classes (objects, array of objects, friend functions, passing and returning objects, function declaration with/without using the return statement). CO 4 - To formulate the applications of pointers and virtual functions. Distinguish formatted and unformatted I/O operations. CO 5 - To develop programs using constructor, destructor, operator overloading and inheritance. (generate a series of fibonacci numbers using constructor in the scope class definition / out of the class definition using the scope resolution
40	PSK206	Skill Enhancement Course (SEC) – Basic Electrical Circuits and Instruments			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To recall the basic definitions and units of electrical quantities. CO 2 - To analyze the circuit elements and their connections. CO 3 - To develop their own circuits using electrical wiring. CO 4 - To compare the Physics concepts behind various electrical instruments and appliances (voltmeter, annueter, incandescent lamp, fluorescent bulb, choke and starter). CO 5 - To demonstrate uses of tester &Multimeter, LDR, Microphone, Judspeaker, etc., CO 6 - To test for the working of electrical circuits and appliances (voltmeter).
41	PP231CC1	Core Course I: Mathematical Physics			PO 1 - To apply their knowledge, analyze complex problems, think independently, formulate and perform quality research. PO 2 - To carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. Demonstrate proficiency in analyzing, applying and solving Scientific problems. PSO 5 - To use the techniques, skills, and modern technology necessary to communicate effectively with professional and ethical responsibility.	CO 1 - To understand use of bracket vector notation and explain the meaning of complete orthonormal set of basis vectors, and transformations and be able to apply them. CO 2 - To able to understand analytic functions, do complex integration, by applying Cauchy Integral Formula. CO 3 - To able to compute many real integrals and infinite sums via complex integration. CO 5 - To solve equations using laplace transform and analyze the fourier transformations of different function, grasp how these transformations can speed up analysis and correlate their importance in technology. CO 6 - To find the solutions for physical problems using linear differential equations and to solve boundary value problems using
42	PP231CC2	Core Course II: Classical Mechanics and Relativity			PO 1 - To apply their knowledge, analyze complex problems, think independently, formulate and perform quality research. PO 2 - To carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. Demonstrate proficiency in analyzing, applying and solving Scientific problems. PSO 5 - To use the techniques, skills, and modern technology necessary to communicate effectively with professional and ethical responsibility.	CO 1 - To understand the fundamentals of Classical Mechanics. CO 2 - To apply the principles of lagrangiam mechanics to solve the equations of motion of physical systems. CO 3 - To apply the principles of hamiltonian mechanics to solve the equations of motion of physical systems. CO 4 - To analyze the small oscillations in systems and determine their normal modes of oscillations. CO 5 - To understand and apply the principles of relativistic kinematics to the mechanical systems.
43	PP231CC3	Core Course III: Linear and Digital ICs and Applications			PO 1 - To apply their knowledge, analyze complex problems, think independently, formulate and perform quality research. PO 2 - To carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. Demonstrate proficiency in analyzing, applying and solving Scientific problems. PSO 5 - To use the techniques, skills, and modern technology necessary to communicate effectively with professional and ethical responsibility.	CO 1 - To remember the basic concepts for the circuit configuration for the design of linear integrated circuits and develops skill to solve problems. CO 2 - To develop skills to design linear and non-linear applications circuits using op-amp and design the active filters circuits. CO 3 - To apply knowledge about PLL, and develop the skills to design the simple circuits using IC 555 timer and can solve problems related to it. CO 4 - To analyze about various techniques to develop A/D and D/A converters.
44	PP231CP1	Core Lab Course I – Advanced Physics Lab I			PO 1 - To apply their knowledge, analyze complex problems, think independently, formulate and perform quality research. PO 2 - To carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication.	PSO 1- To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. Demonstrate proficiency in analyzing, applying and solving Scientific problems. PSO 5 - To use the techniques, skills, and modern technology necessary to communicate effectively with professional and ethical responsibility.	CO 1 - To identify and understand the various forms of renewable and non-renewable energy sources. CO 2 - To understand the principle of utilizing the oceanic energy and apply it for practical applications. CO 3 - To discuss the working of a windmill and analyze the advantages of wind energy. CO 4 - To evaluate the aerobic digestion process from anaerobic digestion. CO 5 - To understand the components of solar radiation, their measurement and apply them to utilize solar energy.
45	PP231EC1	Elective Course I: a) Energy Physics			PO 1 - To apply their knowledge, analyze complex problems, think independently, formulate and perform quality research. PO 2 - To carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication.	PSO 1- To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. Demonstrate proficiency in analyzing, applying and solving Scientific problems. PSO 5 - To use the techniques, skills, and modern technology necessary to communicate effectively with professional and ethical responsibility.	CO 1 - To acquire the basic concepts, nucleation and kinetics of crystal growth. CO 2 - To understand the crystallization principles and growth techniques. CO 3 - To study various methods of crystal growth techniques. CO 4 - To understand the thin film deposition methods. CO 5 - To apply the techniques of thin film formation and thickness measurement.

46	PP231EC2	Elective Course I: b) Crystal Growth and Thin Films		PO 1 - To apply their knowledge, analyze complex problems, think independently, formulate and perform quality research. PO 2 - To curry out internship programmes and research projects to develop scientific and innovative ideas through effective communication.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. Demonstrate proficiency in analyzing, applying and solving Scientific problems. PSO 5 - To use the techniques, skills, and modern technology necessary to communicate effectively with professional and ethical responsibility.	CO 1 - To acquire knowledge on optoelectronic materials. CO 2 - To be able to prepare ceramic materials. CO 3 - To be able to understand the processing and applications of polymeric materials. CO 4 - To be aware of the fabrication of composite materials. CO 5 - To be knowledgeable of shape memory alloys, metallic glasses and nanomaterials.
47	PP231EC3	Elective Course I: c) Material Science		PO 1 - To apply their knowledge, analyze complex problems, think independently, formulate and perform quality research. PO 2 - To carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. Demonstrate proficiency in analyzing, applying and solving Scientific problems. PSO 5 - To use the techniques, skills, and modern technology necessary to communicate effectively with professional and ethical responsibility.	CO 1 - To understand the concepts involved in arithmatic and logical circuits using IC's. CO 2 - To acquire knowledge about combinational logic circuits and sequential logic circuits. CO 3 - To analyze the applications of counters and registers. CO 4 - To acquire knowledge about the applications of laser. CO 5 - To improve the analytical and observation ability in Physics experiments. CO 6 - To analyze various parameters related to operational amplifiers. CO 7 - To understand the strength of material using young's modulus.
48	PP232CC1	Core Course IV: Statistical Mechanics		 PO1 - To apply their knowledge, analyze complex problems, think independently, formulate and perform quality research. PO 2 - To carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication. 	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. PSO 2 - To acquire skills in performing advanced Physics experiments PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. Demonstrate proficiency in analyzing, applying and solving Scientific problems. PSO 5 - To use the techniques, skills, and modern technology necessary to communicate effectively with professional and ethical responsibility.	CO 1 - To examine and elaborate the effect of changes in thermodynamic quantities on the states of matter during phase transition. CO 2 - To interpret the macroscopic properties such as pressure, volume, temperature, specific heat, elastic module etc. using microscopic properties like intermolecular forces, chemical bonding, atomicity and describe the peculiar behaviour of the entropy by mixing two gases. CO 3 - To distinguish canonical and grand canonical ensembles and to interpret the relation between thermodynamical quantities and partition function. CO 4 - To analyze and apply the different statistical concepts to assess the behaviour of ideal fermi gas and ideal bose gas and also
49	PP232CC2	Core Course V: Quantum Mechanics – I		PO 1 - To apply their knowledge, analyze complex problems, think independently, formulate and perform quality research. PO 2 - To carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. Demonstrate proficiency in analyzing, applying and solving Scientific problems. PSO 5 - To use the techniques, skills, and modern technology necessary to communicate effectively with professional and ethical responsibility.	CO 1 - To understand the basic postulates of quantum mechanics which serve to formalize the rules of quantum mechanics. CO 2 - To interpret and relate the schrodinger equation to solve one dimensional problems and three dimensional problems. CO 3 - To apply and analyze various representations, space time symmetries and formulations of time evolution. CO 4 - To construct and prioritize the approximation methods for various quantum mechanical problems. CO 5 - To apply and formulate non-commutative algebra for angular and spin angular momentum and assess spectral line splitting.
50	PP232CP1	Core Lab Course II – Advanced Physics Lab II		PO 1 - To apply their knowledge, analyze complex problems, think independently, formulate and perform quality research. PO 2 - To carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. Demonstrate proficiency in analyzing, applying and solving Scientific problems. PSO 5 - To use the techniques, skills, and modern technology necessary to communicate effectively with professional and ethical responsibility.	CO 1 - To understand the strength of material using young's modulus. CO 2 - To acquire knowledge of thermal behaviour of the materials. CO 3 - To understand theoretical principles of magnetism through the experiments. CO 4 - To acquire knowledge about the applications of laser. CO 5 - To improve the analytical and observation ability in Physics experiments. CO 6 - To analyze various parameters related to operational amplifiers. CO 7 - To understand the concepts involved in arithmatic and laseral circuits using C's
51	PP232EC1	Elective Course II: a) Advanced Optics		PO1 - To apply their knowledge, analyze complex problems, think independently, formulate and perform quality research. PO 2 - To carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication.	PSO 1- To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. Demonstrate proficiency in analyzing, applying and solving Scientific problems. PSO 5 - To use the techniques, skills, and modern technology necessary to communicate effectively with professional and ethical responsibility.	CO 1 - To discuss the transverse character of light waves and different polarization phenomenon. CO 2 - To discriminate all the fundamental processes involved in laser devices and to analyze the design and operation of the devices. CO 3 - To demonstrate the basic configuration of a fiber optic – communication system and advantages. CO 4 - To identify the properties of nonlinear interactions of light and matter. CO 5 - To interpret the group of experiments which depend for their action on an applied magnetics and electric field.
52	PP232EC2	Elective Course II: b) Non-Linear Dynamics		PO1 - To apply their knowledge, analyze complex problems, think independently, formulate and perform quality research. PO 2 - To carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication.	PSO 1- To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. Demonstrate proficiency in analyzing, applying and solving Scientific problems. PSO 5 - To use the techniques, skills, and modern technology necessary to communicate effectively with professional and ethical responsibility.	CO 1 - To gain knowledge about the available analytical and numerical methods to solve various nonlinear systems. CO 2 - To understand the concepts of different types of coherent structures and their importance in science and technology. CO 3 - To apply and analyze simple and complex bifurcations and the routes to chaos. CO 4 - To analyze and evaluate the various types of oscillators, chaos and fractals. CO 5 - To evaluate and create the applications of solitons in telecommunication, applications of chaos in cryptography, computations and that of fractals.
53	PP232EC3	Elective Course II: c) Quantum Field Theory		PO 1 - To apply their knowledge, analyze complex problems, think independently, formulate and perform quality research. PO 2 - To carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. Demonstrate proficiency in analyzing, applying and solving Scientific problems. PSO 5 - To use the techniques, skills, and modern technology necessary to communicate effectively with professional and ethical responsibility.	CO 1 - To understand the interconnection of quantum mechanics and special relativity. CO 2 - To enable the students to understand the method of quantization to various field. CO 3 - To employ the creation and annihilation operators for quantization. CO 4 - To summarize the interacting field, in quantum domain, and gives a discussion on how perturbation theory is used here. CO 5 - To understand the concept of feynman diagram.
54	PP232EC4	Elective Course III: a) Medical Physics		PO 1 - To apply their knowledge, analyze complex problems, think independently, formulate and perform quality research. PO 2 - To carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication. PO 3 - To develop a multidisciplinary perspective and contribute to the knowledge capital of the globe	PSO 1- To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. Demonstrate proficiency in analyzing, applying and solving Scientific problems. PSO 5 - To use the techniques, skills, and modern technology necessary to communicate effectively with professional and ethical responsibility.	CO 1 - To learn the fundamentals, production and applications of X-rays. CO 2 - To understand the basics of blood pressure measurements. CO 3 - To learn about sphygmomanometer, EGC, ENG and basic principles of MRI. CO 4 - To apply knowledge on radiation Physics. CO 5 - To assess the principles of radiation protection.

55	DD121EC5	Elective Course III: b)	1	-	Т	П	PO 1 To apply their knowledge, applying complex	PSO 1. To have well, defined knowledge on theoretical concents and	CO 1 To comprehend set of operations associated with summetry
	FF232BC3	Advanced Spectroscopy					Pro 1 - 10 appr) men knowcoge, anaryze competer problems, think independently, formulate and Per 0.2 - To carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication. PO 3 - To develop a multidisciplinary perspective and contribute to the knowledge capital of the globe.	FSO 1 - 10 have work control and wreage on incorectar concepts and experimental methods of advanced Physics. PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. Demonstrate proficiency in analyzing, applying and solving Scientific problems.PSO 5 - To use the techniques, skills, and modern technology necessary to communicate effectively with professional and ethical responsibility.	CO 1 - To comprehensi set of operations associated with symmetry elements of a molecule, apply mathematical theory while working with symmetry operations. CO 2 - To use group theory as a tool to characterize molecules. CO 2 - To use group theory as a tool to characterize molecules. CO 2 - To use group theory as a tool to characterize molecules. CO 3 - To anigm with the recent advances in semiconductor laser technology combined sensitive spectroscopic detection techniques. CO 4 - To understand principle behind mossbauer spectroscopy and apply the concepts of isomer shift and quadrupole splitting to analyse molecules. CO 5 - To assimilate this XPES quantitative technique and the instrumentation associated with this, as applied in understanding surface of materials. CO 6 - To employ IR and raman spectroscopic data along with
56	PP232EC6	Elective Course III: c) Characterization of Materials					PO 1 - To apply their knowledge, analyze complex problems, think independently, formulate and perform quality research. PO 2 - To carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication. PO 3 - To develop a multidisciplinary perspective and contribute to the knowledge capital of the globe.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, PSO 4 - To apply and interpret Physics principles in various physical observations. Demonstrate proficiency in analyzing, applying and solving Scientific problems. PSO 5 - To use the techniques, skills, and modern technology necessary to communicate effectively with professional and ethical responsibility.	CO 1 - To describe the TGA, DTA, DSC and TMA thermal analysis techniques and make interpretation of the results. CO 2 - To use the concept of image formation in Optical microscope, developments in other specialized microscopes and their applications. CO 3 - To explain the working principle and operation of SEM, TEM, STM and AFM. CO 4 - To understand hall measurement, four –probe resistivity measurement, C-V, I-V, electrochemical, photoluminescence and electroluminescence experimental techniques with necessary theory.
57	PP232SE1	Skill Enhancement Course I - NME I Solar Energy Utilization					PO 1 - To apply their knowledge, analyze complex problems, think independently, formulate and perform quality research. PO 2 - To carry out internship programmes and research projects to develop scientific and innovative ideas through effective communication. PO 3 - To develop a multidisciplinary perspective and contribute to the knowledge capital of the globe. PO 4 - To develop innovative initiatives to sustain ecofriendly environment.	PSO 1 - To have vell-defined knowledge on theoretical concepts and experimental methods of advanced Physics. PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. Demonstrate proficiency in analyzing, applying and solving Scientific problems. PSO 5 - To use the techniques, skills, and modern technology necessary to communicate effectively with professional and ethical responsibility.	CO 1 - To gain knowledge in fundamental aspects of solar energy utilization. CO 2 - To equip to take up related job by gaining industry exposure. CO 3 - To develop entrepreneurial skills. CO 4 - To skill the needy society with different types of solar cells. CO 5 - To gain industrialist mindset by utilizing renewable source of energy.
58	PP2031	Core VII – Electronics					PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academir, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy. Integrated Electronics, AstroPhysics, Molecular Spectroscopy. Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To understand the basic operation, and features related to diodes, transistor, op- amps, converter and interpret. CO 2 - To explain about the internal circuitry and logic behind semiconductor memory devices. CO 3 - To assess the working of diodes, transistor, op- amps and converters. CO 4 - To design various filter circuits.
59	PP2032	Core VIII Condensed MatterPhysics- II					PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, MonoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the theory of dielectrics and analyze the dielectric properties of materials. CO 2 - To explain various types of magnetic phenomenon and their properties and applications. CO 3 - To elaborate the properties and applications. CO 4 - To apply the obtained concepts to challenges.
60	PP20PR	Research Project					PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have vell-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To explore new areas of research in Physics. CO 2 - To analyze a research problem and construct tools for data collection. CO 3 - To write research reports and present results in the scientific community. CO 4 - To develop skills to serve in science related industries and agencies. CO 5 - To develop skills to publish articles in reputed journals.
61	PP2033	Elective III – (a) BioPhysics					PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, NanoPhysics, Natroprosessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the basic structural unit and its different types. CO 2 - To acquire the basic knowledge on various microscopes used to analyse the structure. CO 3 - To analyse the structure of DNA, RNA and Proteins. CO 4 - To explain the techniques used to separate the biomolecules. CO 5 - To determine the interaction of molecules by using different optical and diffraction techniques.

62	DD2024	Elective III (b)		PO 1 To recommize the scientific facts behind	PSO 1 To have well defined knowledge on theoretical concents and	CO 1 To identify the operation of various components of the
62	PP2034	Elective III – (c) Solar Elective III – (c) Solar Energy Utilization		 PO 1 - 10 recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 1 - To recognize the scientific facts behind natural phenomena. 	PSO 1 - 10 nave well-demode knowledge on mooretical concepts and experimental methods of advanced Physics, (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To acquire skills in performing advanced Physics, RSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic, <i>privinomental and vocient construct</i> PSO is a global, economic, <i>perivinomental and vocient construct</i> PSO 1 - To avecestand PSO 7 - To understand the impact of Physics in a global, economic, <i>perivinomental and vocient construct</i> PSO 1 - To accepts and experimental methods of advanced Physics (Classical Mechanics,	CO 1 - To understand the basic concept of heat transfer. CO 2 - To design the solar collectors and solve the optical loss.
				PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 6 - To utilize the obtained scientific knowledge to create eco- friendly environment.	Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	CO 3 - To relate the different types of solar water heaters. CO 4 - To analyze the use of nanostructures and nanomaterials in fiel cell technology. CO 5 - To evaluate the photovoltaic principles and compare the types of solar cells.
64	PP20S1	Self Learning Course: Physics for Lectureship Examination – I		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1- To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To familiarize with a range of mathematical methods that are essential for solving advanced problems in theoretical Physics. CO 2 - To model mechanical systems, both in inertial and rotating frames, using lagrange and hamilton equations. CO 3 - To gain insight into the physical nature of electric and magnetic phenomena. CO 4 - To use quantum mechanical principles to analyze advanced physical phenomena of nature. CO 5 - To understand the theory and methods of statistical Physics and thermodynamics.
65	PP2041	Core IX – Nuclear and Elementary Particle Physics		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	FOO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, ManoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the properties of nuclear forces and outline their behavioral formulation . CO 2 - To analyze the different nuclear models of the nucleus and examine the application of the shell model of nucleus. CO 3 - To explain the characteristics and effect of radioactive decay phenomena. (alpha,beta,gamma) CO 4 - To discuss the outcome of various types of nuclear reactions. CO 5 - To examine the particle Physics phenomena and their basic theoretical description.
66	PP2042	Core X – Spectroscopy		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To apply basic spectroscopic techniques. (microwave, IR,raman and NMR). CO 2 - To infer basic spectroscopic techniques. (microwave, IR, raman, ESR, NQR and NMR). CO 3 - To understand the molecular interactions in different spectroscopic methods. CO 4 - To analyze the characteristics of rotational spectra and vibrational energy of molecules. CO 5 - To utilize various spectroscopic methods suitable for characterizing molecules.
67	PP2043	Core XI —Thermodynamics and Statistical Mechanics		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics, Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physical observations. PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the basic concepts related to thermodynamics, microstates and macrostates. CO 2 - To apply principles to find relation between grand canonical and canonical partition functions. CO 3 - To solve the boltzmann distributions bose– einstein, fermi– dirac and maxwell. CO 4 - To analyze the origin of transport and non– equilibrium processes. CO 5 - To understand the concept of heat capacities and phasetransitions.
68	PP2044	Elective IV - (a) Materials Physics and Processing Techniques		PO 1- To recognize the scientific facts behind natural phenomena. PO 2- To relate the theory and practical knowledge to solve the problems of the society. PO 3- To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4- To face and succeed in high level competitive examinations like NET, GATE and TOFEL	PSO 1- To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, Solid State Physics, MonoPhysics, Microprocessor etc.).PSO 2- To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To adply and interpret Physics principles in various physical observations.PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic, environmental, and societal context.	 C0 1 - To remember basic principles in material Physics. C0 2 - To remember basic principles in material Physics. C0 3 - To understand various material fabrication methods. C0 4 - To analyse different characterization used for materials processing. C0 5 - To apply different methods of material processing. C0 5 - To evaluate the materials and characterization tools.

60	PD2045	Elective IV (b)	I I	Т	Т		PO 1 To recomize the countifie facts behind	PSO 1. To have well defined knowledge on theoretical concents and	CO 1. To identify how basis Physics can be used to describe the
69	FF2043	Advanced Nano Physics					PO 1- 10 recognze me scientific facts definited natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	FSO 1- 10 Inve Wein-deimed knowledge on incorectar concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations.PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics.PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To identify how basic Physics can be used to describe the behaviour of electrons in nano-scale materials. CO 2 - To explain the variation in the electron distribution in nanostructures for different dimensions(quantum well,quantum wires & quantum dots). CO 3 - To analyze magneto electronics and applications of nanotechnology in various fields. CO 4 - To explain laser effect in quantum well, quantum wires and quantum dots.
70	PP2046	Elective IV – (c) X-ray Crystallography					PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	 PSO 7 - To understand the impact of Physics in a global, economic, PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, ManoPhysics, Nicroprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving scientific problems. 	CO 1 - To understand the sources and diffraction of X- rays. CO 2 - To acquire the basic knowledge on crystal systems and various properties of crystals. CO 3 - To explain the crystallographic data collection tools and intensity measurement method. CO 4 - To analyse the structure factor and intensity of diffracted peaks. CO 5 - To obtain the refined crystal structure by applying mathematical calculations.
71	PP20P3	Practical III- Advanced				⊵	PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To analyse the working of code converters (BCD / gray,
		Physics Lab – III(Electronics)					natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 6 - To utilize the obtained scientific knowledge to create eco- friendly environment.	experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	excess 3). CO 2 - To design various synchronous and asynchronous sequential circuits and study their working. CO 3 - To analyse the applications of op- amps (sine, triangular wavegenerator, low, high and band pass filters). CO 4 - To analyse the behavior of counters (up/down, mod, ring). CO 5 - To analyse the working of electronic circuits (multiplexer, demultiplexer, adder, subtractor).
72	PP20P4	Practical IV -Advanced Physics Lab – IV (Microprocessor and Micro Controller)					PO I - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 6 - To utilize the obtained scientific knowledge to create eco- friendly environment.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic, environmental and sociated context.	CO 1 - To experiment with assembly language programming on 8085 microprocessor (addition, subtraction, multiplication &division). CO 2 - To apply assembly language programming on microprocessor (data Manipulation, square of numbers, counters). CO 3 - To analyse the interfacing of microprocessor 8085 with I/O devices (A/D& D/A, stepper motor). CO 4 - To apply assembly language programs for 8051 microcontroller.
73	PP20S2	Self Learning Course: Physics for Lectureship Examination – II			0		PO 1- To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have vedl-defined knowledge on theoretical concepts and experimental methods of advanced Physics, (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Niteroprocessore etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the physical construction, working and operational characteristics of semiconductor devices. CO 2 - To attain knowledge on the structure and dynamics of the molecules through various theories. CO 3 - To develop analytical thinking to understand the phenomenon that decide various properties of solids. CO 4 - To know the scientific, environmental and technological applications of nuclear Physics. CO 5 - To study the fundamentals of wave mechanics.
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74	PC2011	Major Core I - Mechanics					[PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2- To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand and define the laws involved in mechanics. CO 2 - To apply conservation laws in collision experiments. CO 3 - To interpret the principles of gravitation and moment of inertia through theory and experiments. CO 4 - To analyze the fundamentals of center of mass and rocket motion. CO 5 - To apply pressure velocity relation in fluid flow in the field of fluid dynamics. CO 6 - To understand and define the laws involved in mechanics. CO 6 - To understand and define the laws involved in mechanics.
75	AP2011	Allied I- Allied Physics I for Mathematics					PO I - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze their localyze the results with theoretical expectations.	CO 1 - To acquire knowledge on elementary ideas of electricity and magnetism, electronics, optics and nuclear Physics. CO 2 - To analyze the concepts and study their applications in the field of electricity and magnetism, electronics, optics and nuclear Physics. CO 3 - To apply their depth knowledge of Physics in day today life. CO 4 - To analyze the fundamentals of center of mass and rocket motion. CO 5 - To develop their knowledge and carry out the practical by
76	PNM201	Non Major Elective (NME) – Physics in Everyday Life I					PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand their knowledge of basic scientific principles and fundamental concepts in Physics. CO 2 - To recall the various phenomena of sound waves applied in day today life. CO 3 - To understand the basic laws of Physics and different forces involved in nature. CO 4 - To explain the Physics concepts behind the sports. CO 5 - To categorize different characteristic nature of light and its properties like refraction, reflection and diffraction.

77	PC2021	Major Core II -Properties of matter and Sound Allied II – Allied				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. PO 1 - To apply the acquired scientific knowledge	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations. PSO 1 - To understand the core theories and principles of Physics which	CO 1 - To identify the materials suitable for construction of buildings, based on the moduli of elasticity. CO 2 - To paraphrase the properties of liquids and its determination. CO 3 - To analyze the Physics of sound and its applications. CO 4 - To integrate the concepts of acoustic comfort and better understanding of the theories used in building acoustics.
		Physics II for Mathematics				In face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	and magnetism, electronics, optics and nuclear Physics. CO 2 - To analyze the concepts and study their applications in the field of electricity and magnetism, electronics, optics and nuclear Physics. CO 3 - To apply their depth knowledge of Physics in day today life. CO 4 - To develop their knowledge and carry out the practical by applying these concepts.
79	PNM202	Non Major Elective (NME)– Physics in Every Day Life II				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the principle and working of simple devices used in day to day life. CO 2 - To identify the symbols used for various electronic components and infer the electronic tools. CO 3 - To distinguish different heavenly bodies (star.planet.comets, galaxies). CO 4 - To recall various applications of Physics concepts in everyday life.
80	PC20P1	Major Practical I - Physics Lab I	Y	V		PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 4 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To acquire knowledge on elementary ideas of electricity and magnetism, electronics, optics and nuclear Physics. CO 2 - To analyze the concepts and study their applications in the field of electricity and magnetism, electronics, optics and nuclear Physics. CO 3 - To apply their depth knowledge of Physics in day today life. CO 4 - To develop their knowledge and carry out the practical by applying these concepts.
81	AP20P1	Allied Practical – General Physics Lab				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze pSO 5 - To analyze their local, we can an and a provide the results with theoretical expectations.	CO 1 - To acquire knowledge on elementary ideas of electricity and magnetism, electronics, optics and nuclear Physics. CO 2 - To analyze the concepts and study their applications in the field of electricity and magnetism, electronics, optics and nuclear Physics. CO 3 - To apply their depth knowledge of Physics in day today life. CO 4 - To develop their knowledge and carry out the practical by applying these concepts.
			+	+	+	4		
82	PC2031	Major Core III – Heat and Thermodynamics	Ø			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand experimental methods to determine the transmission of heat. CO 2 - To analyze the work and heat interactions associated with a prescribed process path and to perform a analysis of a flow system. CO 3 - To understand the basic concepts of thermodynamics like system, properties, equilibrium, pressure, specific volume, temperature and the laws of thermodynamics. CO 4 - To evaluate entropy changes in a wide range of processes and determine the reversibility of a processes from
82	PC2031	Major Core III – Heat and Thermodynamics Major – Elective - I a) Non Conventional Energy Sources				 PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 4 - To reflect upon green initiatives and take responsible steps to build a sustainable. 	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and tiverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc.PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 3 - To apply the critical reasoning and computing skills to analyze analyze their local, national and global impact.PSO 4 - To apply heoretical reasoning and computing skills to analyze physics and analyze their local, national and global impact.PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand experimental methods to determine the transmission of heat. CO 2 - To analyze the work and heat interactions associated with a prescribed process path and to perform a analysis of a flow system. CO 3 - To understand the basic concepts of thermodynamics like system, properties, equilibrium, pressure, specific volume, temperature and the laws of thermodynamics. CO 4 - To evaluate entropy changes in a wide range of processes and determine the reversibility or inreversibility of a process from CO 1 - To apply the solar energy in various sectors. CO 2 - To explain the basic principles of wind energy conversion, various biomass conversion processes and its classification. CO 3 - To discuss the goothermal energy resources and chemical energy resources. (fuel cells). CO 4 - To solve the present and future energy crisis.
82	PC2031 PC2032 PC2033	Major Core III – Heat and Thermodynamics Major – Elective - I a) Non Conventional Energy Sources Major – Elective - I b) Fundamentals of Physics - I				 PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. 	 PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2- To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3- To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4- To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 5- To analyze the observed experimental data and relate the results with theoretical expectations. PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 1- To understand the core theories and principles of Physics and analyze their local, national and global impact. PSO 1- To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 3- To analyze the observed experimental data and relate the results with theoretical expectations. PSO 4- To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 1- To understand the core theories and principles of Physics and analyze their local, national and global impact. PSO 1- To understand the core theories and principles of Physics and analyze their local, national and global impact. PSO 1- To understand the core theories and principles of Physics and analyze their local, national and global impact. PSO 1- To understand the core theories and principles of Physics and analyze their local, national and global impact. PSO 4- To apply knowledge of principles, concepts in Physics and a	CO 1 - To understand experimental methods to determine the transmission of heat. CO 2 - To analyze the work and heat interactions associated with a prescribed process path and to perform a analysis of a flow system. CO 3 - To understand the basic concepts of thermodynamics like system, properties, equilibrium, pressure, specific volume, temperature and the laws of thermodynamics. CO 4 - To evaluate entropy changes in a wide range of processes and determine the reversibility or irreversibility of a process from CO 1 - To apply the solar energy in various sectors. CO 2 - To explain the basic principles of wind energy conversion, various biomass conversion processes and tic lassification. CO 3 - To discuss the geothermal energy resources and chemical energy resources. (fuel cells). CO 4 - To solve the present and future energy crisis. CO 1 - To understand the fundamentals of dynamics. CO 2 - To determine the behavior of a ray at any optical surface (lenses, prisms). CO 3 - To outline the extraction of useful energy from earth, ocean, wind and sun. CO 4 - To determine the significance of steady current and alternating current. CO 4 - To apply kinchoff's laws to simple electrical circuits.
82 83 84 85	PC2031 PC2032 PC2033 PC2033	Major Core III – Heat and Thermodynamics Major – Elective - I a) Non Conventional Energy Sources Major – Elective - I b) Physics - I Major – Elective - I c) Microprocessor Fundamentals				 PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To Carry out field works and projects in collaboration with other institution. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 4 - To reflect upon green initiatives and take responsible steps to build a sustainable. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 1 - To reflect upon green initiatives and take responsible steps to build a sustainable. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To face challenging competitive examinations that offer rewarding careers in science and education. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To care innovative ideas through laboratory experiments. PO 3 - To care take innovative ideas through laboratory experime	 PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 1 - To apply havoledge of principles, oncepts in Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations. PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 4 - To apply the critical reasoning and computing skills to analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To apply the critical reasoning and computing skills to analyze their local, national and global impact. 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CO 1 - To understand the fundamentals of dynamics. CO 2 - To solve the present and future energy crisis. CO 1 - To understand the fundamentals of dynamics. CO 2 - To determine the behavior of a ray at any optical surface (lenses, prisms). CO 3 - To outline the extraction of useful energy from earth, ocean, wind and sun. CO 4 - To apply kirchoff's laws to simple electrical circuits. CO 1 - To know the basic ideas on microprocessor, memory and I/O devices. CO 2 - To apply kirchoff's laws to simple electrical circuits. CO 1 - To and inter facing. CO 3 - To acquire skills in the programming instruction sets of microprocessor. CO 5 - To apply kirchoff's laws to simple electrical circuits.

87	PC2081	Self Learning Course -			2	1	PO 1 - To apply the acquired scientific knowledge	PSO 1 - To understand the core theories and principles of Physics which	CO 1 - To recall the principles of mechanics and conservation
07	PC2041	Mains Correl IV	0				FO 1 - To apply an edgement accument anomedge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. PO 7 - To equip students with hands on training through various courses to enhance PO 1 - To entury the memory entering institution.	130 1 To that and use the theorem and principles of tribute which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 To understand the local/data of accentration later on the later of the la
80	102041	Optics and Spectroscopy	Ð	2			FO 1 - 10 apply the adjunct scenaric knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To face challenging competitive examinations that offer rewarding careers in science and education.	130 1 * 10 lineit statul use Core lenotes and principles of Trystes which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze the beserved experimental data and relate the results with theoretical expectations.	CO 1 - 10 understand use knowledge of geometric optical is the par- ticle design of many optical systems and instruments including aberrations in lens system. CO 2 - To determine the behavior of a ray and wave at any optical surface. CO 3 - To analyze the intensity variation of light due to polarization, interference and diffraction. CO 4 - To study of phenomena interference, diffraction, and polarization lays the foundation for an understanding of concepts such as holograms, interferenceters.
89	PC2042	Major – Elective - II a) Computer Programming in C++					PO 1- To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the different types of operators and expressions in C++ language. CO 2 - To implement different operation an arrays and use function to solve the given problem. CO 3 - To understand member functions and constructors. CO 4 - To analyze pointers, operator overloading and inheritance. CO 5 - To analyze input/output operations.
90	PC2043	Major – Elective - II b) Medical Physics					PO 1- To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the anatomical terms of the body. CO 2 - To explain the physical dynamics of the body. CO 3 - To analyse the heat and pressure system of the body. CO 4 - To discuss the optical and electrical behavior of the human body. CO 5 - To gain knowledge and application ideas regarding diagnostic systems.
91	PC2044	Major – Elective - II c) Optoelectronics	Ø				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To explain the various methods of propagation of light waves through various types of fibres . CO 2 - To understand the basic concepts of fiber optics and types of fibers. CO 3 - To explain the structure and performance of LED;s and Lasers. CO 4 - To classify the optical sources and detectors and to discuss their principle. CO 5 - To discuss the channel impairments such as losses and dispersion.
92	AP2041	Allied II – Allied Physics II for Chemistry	D	R	0		PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze their localyze the present and relate the results with theoretical expectations.	CO 1 - To acquire knowledge on elementary ideas of electricity and magnetism, electronics, atomic and nuclear Physics . CO 2 - To analyze the concepts and study their applications in the field of electricity and magnetism, electronics and nuclear Physics. CO 3 - To apply their depth knowledge of Physics in day today life. CO 4 - To develop their knowledge and carry out the practical by applying the concepts of a rectifier, amplifiers and oscillator, basic digital electronics principles through logic gates and the laws governing them.
93	PC20P2	Major Practical II - Physics Lab II	D				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the scientific method and an ability to apply the scientific method in practice. CO 2 - To recall the basic experiments; improve the basic skills and attitude which help them to apply these skills in their field of Physics. CO 3 - To understand the practical knowledge of various bridges (desauty's and owen's bridge) by demonstration of experiments. CO 4 - To verify the thevenins and nortons theorem. CO 5 - To 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. CO 6 - To analyze the physical principle involved in the various
94	AP20P1	Allied Practical – General Physics Lab	Ø				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the basic principles of Physics through experiments. CO 2 - To measure and determine the various physical parameters. CO 3 - To develop an idea about the handling of various instruments. CO 4 - To get an idea about basic scientific knowledge and implications of its broad working principle. CO 5 - To analyzing, interpreting and evaluating data. CO 6 - To build a foundation in scientific career.
95	PC20S2	Self Learning Course: Physics for Competitive Examination – II		V	0		PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. PO 7 - To equip students with hands on training through various courses to enhance	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To discuss the principles and generation of electric charges. CO 2 - To classify the different types of magnetic materials. CO 3 - To correlate the mechanisms involved between magnetism and electricity. CO 4 - To discuss the principles behind the phenomena of atomic Physics and nuclear reactions. CO 5 - To apply the laws of thermodynamics on heat phenomena. CO 6 - To apply the laws of thermodynamics on heat phenomena. CO 7 - To recognize the elements of microprocessors and computers.
96	PC2051	Major Core V – Classical and Statistical Mechanics			10		PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	IPSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze their toalyze the the results with theoretical expectations.	CO 1 - To understand the basic mechanical concepts related to system of particles. CO 2 - To apply various mechanical principles to find solution for physical problem. CO 3 - To solve the equations of motion using hamiltonian formalism. CO 4 - To explain the fundamental postulates of statistical mechanics and maxwell boltzmann statistics. CO 5 - To understand and develop a scientific knowledge in quantum statistics.

97	PC2052	Major Core VI -			PO 1 - To apply the acquired scientific knowledge	PSO 1 - To understand the core theories and principles of Physics which	CO 1 - To understand the fundamental principles of
		Analog Electronics			to face day to day needs. PO 2 - To create involving ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	semiconductors including P-N junctions and zener diode. CO 2 - To illustrate network theorems like thevenin's theorem, norton's theorem etc., CO 3 - To analyze the operation of transistor , amplifier, oscillator and multivibrator. CO 4 - To demonstrate practical skills in the simulation, construction and testing of simple electrical and electronic circuits. CO 5 - To understand and develop a scientific knowledge in
98	PC2053	Major Core VII - Solid State Physics			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To illustrate various types of bonding present in solids with example. CO 2 - To explain the various crystal parameters and structures. CO 3 - To discuss the various theories involved in magnetic materials. (dia, para, ferro, ferri and antiferro magnetism). CO 4 - To describe polarization processes and analyze the information contained in the temperature and frequency dependence of dielectric materials. CO 5 - To analyze the structure and physical properties of semiconductors.
99	PC20PR	Research Project			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To explore new areas of research in Physics. CO 2 - To analyze a research problem and construct tools for data collection. CO 3 - To write research reports and present results in the scientific community. CO 4 - To develop skills to serve in science related industries and agencies.
100	PC2061	Major Core VIII – Relativity and Quantum Mechanics			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To gain knowledge in the concepts of special and theory of relativity. CO 2 - To evolve ideas about dual nature of matter. CO 3 - To recognize basic terms in quantum mechanics and different operator mechanism. CO 4 - To apply of schrödinger's equation to micro system.
101	PC2062	Major Core IX – Digital and Communication Electronics			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the basic operation, and features related to Logic gates and interprets their applications. CO 2 - To acquire knowledge on number system, arithmetic building blocks, and memories. CO 3 - To understand the fundamental concepts of logic gates, counters, registers, fiber optics, etc CO 4 - To develop skill to build and troubleshoot combinational digital circuits. CO 5 - To understand AM, FM and PM modulation and demodulation techniques. CO 6 - To analyze the concepts trained in the computer lab activities and provide an understanding of data acquisition and analysis.assess the basic concepts of fiber optics and types of fiber diodes, transistor, op-amps and converters.
102	PC2063	Major Core X - Nuclear Physics			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze their losserved experimental data and relate the results with theoretical expectations.	CO 1 - To understand the basics of nuclear Physics that treats atomic nuclei as self-bound many-body quantum systems. CO 2 - To acquire knowledge about particle- antiparticle, decay processes and their outcomes. CO 3 - To basic interaction between fundamental particles.
103	PC2064	Major – Elective – III a) Mathematical Physics			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze their observed experimental data and relate the results with theoretical expectations.	CO 1 - To illustrate linear dependence and combination of vectors as quantities in Physics. CO 2 - To solve ordinary and partial differential equations related to physical science. CO 3 - To evaluate problems in matrices. CO 4 - To adapt laplace transform technique to obtain the laplace series of periodic functions of Physics. CO 5 - To understand and manipulate random variables using the theory of probability including tools of probability transformation and characteristic functions.
104	PC2065	Major – Elective – III b) NanoPhysics			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To nanlyze their observed experimental data and relate the results with theoretical expectations.	CO 1 - To infer the history of nanotechnology and explain the synthesis of nanomaterials. CO 2 - To interpret quantum well, quantum wires and quantum dots. CO 3 - To explain the carbon nanotubes and its applications. CO 4 - To discuss the applications of nanotechnology in various fields.
105	PC2066	Major – Elective – IIÎ c) AstroPhysics			[PO 1- To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To perceive the historical evolution of solar system and planets. CO 2 - To describe the principles of Physics in the formation of astronomical objects like planets-Satellites - Asteroids and Comets. CO 3 - To examine the requirements and limitations of instrumentation for modern astrophysical observations (Optical telescopes and Radio telescopes). CO 4 - To examine the requirements and limitations of instrumentation for modern astrophysical observations (Optical telescopes and Radio telescopes). CO 5 - To analyse the formation of stars, pulsars, Neutron stars and Black Holes. CO 6 - To interpret the observations of galaxies, star clusters,

106	PC20P3	Major Practical III -	1	Т	Т	PO 1 - To apply the acquired scientific knowledge	PSO 1 - To understand the core theories and principles of Physics which	CO 1 - To demonstrate the experimental techniques and develop
100	PC20P3	Major Fracticar III - Physics Lab III				PO 1 - 10 apply the acquired schemine knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	FSO 1 = 10 understand une core neores and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To demonstrate the experimental techniques and develop competence in handling optical instruments. CO 2 - To analyze the diffraction and dispersion phenomena in optical elements (grating or prism) using spectrometer. CO 3 - To develop practical hands-on experience applying widely used techniques to investigate optical phenomena. (Oblique incidence, i-d curve). CO 4 - To record, analyze, interpret and critically evaluate Cauchy's constant and Hartmann's interpolation formula experimentally. CO 5 - To evaluate the meal assume taxe using MCD BC and
107	PC20P4	Major Practical IV - Physics Lab IV			2	PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To develop knowledge and skills relating to electricity and electronics through hands-on learning experience. CO 2 - To understand the fundamental concepts and mechanisms used in DigitalElectronics. (Logic gates and Flip – Flops). CO 3 - To design and analyse digital systems / logical circuits.(De Morgans theorems using IC). CO 4 - To analyse and design various combinational and sequential circuits.(Flip flop, Encoder, Decoder, Op-amp etc.). CO 5 - To infer the operation of basic logic gates, understand Boolean algebra and simplify simple Boolean functions by using height produce and be
108	PC20P5	Major Practical V - Physics Lab V			2	PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the principles of object oriented program to construct computer programs and modeling of experimental data for the solution of problems in Physics. (period of a pendulum and Young's modulus of a material). CO 2 - To apply object oriented programming techniques to solve computing problems. (addition, subtraction, multiplication and division). CO 3 - To develop programs using functions and classes. (objects, array of objects, friend functions, passing and returning objects, function declaration with/without using the return statement). CO 4 - To formulate the applications of pointers and virtual functions. Distinguish formatted and unformatted I/O operations. CO 5 - To develop programs using construct, destructor, operator overloading and inheritance. (generate a series of Fibonacci numbers using constructor in the scope of class definition / out of the class definition using the scope resolution
109	PSK206	Skill Enhancement Course (SEC) – Basic Electrical Circuits and Instruments				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze their locaryce the results with theoretical expectations.	CO 1 - To recall the basic definitions and units of electrical quantities. CO 2 - To analyze the circuit elements and their connections. CO 3 - To develop their own circuits using electrical wiring. CO 4 - To compare the Physics concepts behind various electrical instruments and appliances (Volmeter, Ammeter, Incandescent lamp, fluorescent bulb, Choke and Starter). CO 5 - To demonstrate uses of tester & Multimeter, LDR, Microphone, loudspeaker, etc. CO 6 - To test for the working of electrical circuits and appliances (
110	PP2011	Core I – Classical Mechanics			2	PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFFL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic, environmental and orcital context	CO 1 - To understand the basic mechanical concepts related to single andsystem of particles. CO 2 - To apply various mechanical principles to find solution for physicalproblems. CO 3 - To solve the equations of motion using Lagrangian, Hamiltonian andHamilton–Jacobi equations. CO 4 - To explain the origin of coriolis and centrifugal terms in the equation ofmotion in a rotating frame. CO 5 - To understand and develop a scientific knowledge in central force problems and relativity.
111	PP2012	Core II – Mathematical Physics				PO 1- To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To apply the various theorems in complex analysis to evaluate definite integrals. CO 2 - To determine the series solutions and the recurrence relations/Bessel, Legendre and Hermite differential equations) and solve problems associated with them. CO 3 - To discuss the basic principles and methods used for the analysis of partial differential equations and apply the techniques to related problems. CO 4 - To discuss the concepts of Fourier, Laplace and inverse Laplace transform, tensors, group theory and their properties. CO 5 - To develop expertise in mathematical techniques required in Physics and to enhance problem solving skills.
112	PP2013	Core III – Quantum Mechanics– I				IPO 1- To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFFL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic, environmental and Asscietal context.	CO 1 - To summarize the concept of wave function and the postulatesof quantum mechanics. CO 2 - To formulate time dependent and time independent equation and solve them for simple potentials. CO 3 - To evaluate the eigen values and eigen function spin and total angular momenta and determine the matrices. CO 4 - To analyze the principles of quantum theory, equation of motion, scattering theory and angular momentum.
113	PP2014	Elective I – (a) Advanced Nuclear Physics				[PO 1- To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations.PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the basic knowledge on nuclei and neutron to know other factors like properties and scattering. CO 2 - To examine the neutron interactions to formulate probability, diffusion, Fermi- age equations. CO 3 - To analyse the working of nuclear reactors and its reaction to produce nuclear energy. CO 4 - To study the nuclear fusion reaction and apply its principle forstellar energy.

114	PP2015 PP2016	Elective I – (b) Molecular Physics Elective I – (c) Numerical Methods				N	PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, ManoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 4 - To understand the impact of Physics in a global, economic, PSO 1 - To understand the impact of Physics in a global, economic, PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Mathematical Physics, Quantum Mechanics, Solid State Physics,	 CO 1 - To understand the chemical bonding of molecules and various theories of homo and hetero nuclear diatomic molecules. CO 2 - To analyze the symmetry operations and molecular orbital theory. CO 3 - To analyze the electronic properties of molecules, Newtonian and Hamiltonian dynamics and Phase space trajectories. CO 4 - To understand the molecular collisions and different energies caused by reactive collisions. CO 5 - To evaluate the transport of electron and the formation of electronic bands and spectra. CO 1 - To apply various interpolation methods and finite difference concepts. CO 2 - To analyze the numerical solutions of linear and non linear equations.
							PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	CO 3 - To utilize various numerical methods for differentiation and integration. CO 4 - To solve ordinary differential equations whenever and wherever routine methods are not applicable.
116	PP2021	Core IV – Electromagnetic Theory				N	PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations.PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To denonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To summarize the fundamental laws of electrodynamics based on Maxwell's equations. CO 2 - To enumerate the concept of energy in electrostatic and magnetostatic fields. CO 3 - To illustrate the electrical properties of materials. CO 4 - To solve the wave equation as plane waves in source. CO 5 - To analyze the wave polarization and reflection / transmission of plane waves in homogenous media.
117	PP2022	Core V – Quantum Mechanics– II				N	PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have vell-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To enumerate time independent perturbation theory and use approximation methods. (variation principle and WKB method) to solve simple problems (ground state helium, barrier penetration, etc). CO 2 - To analyze time dependent perturbation theory to discuss absorption and emission of radiation forharmonic perturbation. CO 3 - To interpret quantum theory of atomic and molecular structure. CO 4 - To formulate Klein– Gordan and Dirac equations and discuss the applications (particle in a Coulomb field, Spin of electron).
118	PP2023	Core VI – Condensed MatterPhysics– I	(2	Ø	Ø	PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To differentiate between different lattice types and explain the concepts of reciprocal lattice and crystal diffraction. CO 2 - To analyze various crystal imperfections and ordered phases of crystal. CO 3 - To explain the theory of lattice vibrations and analyze the thermal properties of solids. CO 4 - To formulate the problem of electrons in a periodic potential.
119	PP2024	Elective II – (a) Experimental design					PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, MonoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the principle and working of transducers. CO 2 - To examine the measurement systems and errors in it. CO 3 - To analyse the X ray measurements and to find TEM, SEM,EDS, FESEM, AFM, UV Vis, IR, FTIR characterizations. CO 3 - To get an introduction and idea on optical fibres.
120	PP2025	Elective II – (b) Introductory Astronomy, Astro Physics& Cosmology					PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, MonoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To perceive the historical evolution of solar system and universe. CO 2 - To describe the principles of Physics in the formation of astronomical objects like planets, satellites, asteroids and comets. CO 3 - To gain experience with measurement techniques and equipment and develop the ability to assess certainties and assumptions. CO 4 - To interpret the observations of galaxies, dark matter, quasars and pulsars. CO 5 - To achieve a good understanding of physical laws and principles in cosmology.

121	PP2026	Elective II – (c) Laser Physics Practical I – Advanced Physics Lab – I (General Physics)		Q		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial parsuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research,	 PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 4 - To development proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics, experiments 	 CO 1 - To develop knowledge in the basics of lasers. CO 2 - To enhance comprehension in the principles of lasers . CO 3 - To analyse the control of laser operites. CO 4 - To familiarize with the diverse applications of lasers. CO 1 - To demonstrate practical skills to work with complex problems and advanced experimental equipment. CO 2 - To develop a practical knowledge in Hall Effect and in determination of Magneto resistance. CO 4 - To evelop practical experiment in LASER experiments. CO 4 - To desure the diverse in LASER experiments. CO 4 - To measure and compare the dielectric constant of various
						entrepreneurial pursuits and consulting firms. PO 6 - To utilize the obtained scientific knowledge to create eco- friendly environment.	and projects using modern technology and numerical simulations. PSO 3. To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4. To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	liquids. CO 5 - To apply ultrasonic interferometers to determine the velocity of sound.
123	PP20P2	Practical II – Advanced Physics Lab – II (Programming with C++)				PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 6 - To uilize the obtained scientific knowledge to create eco- friendly environment.	PSO 1- To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Niteroprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physical observations.PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the basic concept of Object Oriented Programming (OOP). CO 2 - To interpret the theoretical formulation for physical phenomena and apply experimental numerical. CO 3 - To simulations methods on find the solution. CO 4 - To apply computational methods and numerical algorithms to problems in advanced Physics using C++ programming. CO 5 - To develop a basic knowledge in high level programming languages.
124	PP2031	Core VII – Electronics	\mathbf{r}	N	Y	PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Niteroprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the basic operation and features related to diodes, transistor, op– amps, converter and interpret. CO 2 - To explain about the internal circuitry and logic behind semiconductor memory devices. CO 3 - To assess the working of diodes, transistor, op– amps and converters. CO 4 - To design various filter circuits.
125	PP2032	Core VIII – Condensed MatterPhysics– II				PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics, (Classical Mechanics, Mahematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Niteroprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the theory of dielectrics and analyze the dielectric properties of materials. CO 2 - To explain various types of magnetic phenomenon and their properties and applications. CO 3 - To elaborate the properties and applications. CO 4 - To apply the obtained concepts to challenges.
126	PP20PR	Research Project	\mathbf{r}	N	Y	PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To explore new areas of research in Physics. CO 2 - To analyze a research problem and construct tools for data collection. CO 3 - To write research reports and present results in the scientific community. CO 4 - To develop skills to serve in science related industries and agencies. CO 5 - To develop skills to publish articles in reputed journals.
127	PP2033	Elective III – (a) BioPhysics				[PO 1- To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFFL.	PSO 1- To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic, environmental, and societal context.	CO 1 - To understand the basic structural unit and its different types. CO 2 - To acquire the basic knowledge on various microscopes used to analyse the structure. CO 3 - To analyse the structure of DNA, RNA and Proteins. CO 4 - To explain the techniques used to separate the biomolecules. CO 5 - To determine the interaction of molecules by using different optical and diffraction techniques.

128	PP2034	Elective III – (b) Microprocessor and Microcontroller Elective III – (c) Solar Energy Utilization		 PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To talze the obtained scientific knowledge to competitive examinations like NET, GATE and TOFEL. 	 PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physical observations. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 7 - To understand the impact of Physics in a global, economic, PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics, Sloid State Physics, Mathematical Physics, NanoPhysics, Microprocessor etc.). PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontines, Mathematical Physics, Quantum Mechanics, Solid State Physics, ManoPhysics, Microprocessor etc.). PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontires of Physical observations. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 4 - To develop and communicate analytical skills ranging from such to cosmology to progress in the expanding frontires of Physical observations. 	 CO 1 - To identify the operation of various components of the microprocessor 8085 and microprocessor 8086. CO 2 - To relate and explain the various addressing modes and the instruction set of 8085 microprocessor. CO 3 - To develop skill in writing simple programs for 8085 microprocessor. CO 4 - To explain the architecture of 8051 microcontroller. CO 5 - To understand the various interrupts of 8085 microprocessor. CO 1 - To understand the basic concept of heat transfer. CO 2 - To design the solar collectors and solve the optical loss. CO 3 - To design the solar collectors and solve the optical loss. CO 3 - To analyze the use of nanostructures and nanomaterials in finel cell technology. CO 5 - To avaluate the photo voltaic principles and compare the types of solar cells.
130	PP20S1	Self Learning Course: Physics for Lectureship Examination – I		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pusuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 7 - To understand the impact of Physics in a global, economic, PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics, Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To familiarize with a range of mathematical methods that are essential for solving advanced problems in theoretical Physics. CO 2 - To model mechanical systems, both in inertial and rotating frames, using Lagrange and Hamilton equations. CO 3 - To gain insight into the physical nature of electric and magnetic phenomena. CO 4 - To use quantum mechanical principles to analyze advanced physical phenomena of nature. CO 5 - To understand the theory and methods of statistical Physics and thermodynamics.
131	PP2041	Core IX – Nuclear and Elementary Particle Physics		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, MonoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To understand the properties of nuclear forces and outline their behavioral formulation. CO 2 - To analyze the different nuclear models of the nucleus and examine the application of the shell model of nucleus. CO 3 - To explain the characteristics and effect of radioactive decay phenomena. (alpha,beta,gamma) discuss the outcome of various types of nuclear reactions. CO 4 - To examine the particle Physics phenomena and their basic theoretical description.
132	PP2042	Core X – Spectroscopy	\bigtriangledown	PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To apply basic spectroscopic techniques (Microwave, IR,Raman and NMR). CO 2 - To infer basic spectroscopic techniques (Microwave, IR,Raman, ESR, NQR and NMR). CO 3 - To understand the molecular interactions in different spectroscopic methods. CO 4 - To analyze the characteristics of rotational spectra and vibrational energy of molecules. CO 5 - To utilize various spectroscopic methods suitable for characterizing molecules.
133	PP2043	Core XI —Thermodynamics and Statistical Mechanics		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the basic concepts related to thermodynamics, microstates and macrostates. CO 2 - To apply principles to find relation between grand canonical and canonical partition functions. CO 3 - To solve the Boltzmann distributions Bose–Einstein, Fermi–Dirac and Maxwell. CO 4 - To analyze the origin of transport and non– equilibrium processes. CO 5 - To understand the concept of heat capacities and phase transitions.
134	PP2044	Elective IV – (a) Materials Physics and Processing Techniques		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To remember basic principles in material Physics. CO 2 - To understand various material fabrication methods. CO 3 - To analyse different characterization used for materials processing. CO 4 - To apply different methods of material processing. CO 5 - To evaluate the materials and characterization tools.

125	DD2045	Election IV (b)	1	T	Т	10	DO 1. To serve anima the animatific fronts habing	DEC 1. To have well defined be unded as an effected and the sector of	CO 1 To identify have been Director and he would be describe the
133	112045	Advanced Nano Physics					FOT FOTECOGIZE the Scientific Tasts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneuring Jurusitis and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFFL.	FIGUT 10 new weir-bounde advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). FSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. FSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. FSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 = 10 detunity how basic Figures can be deet not describe the behaviour of electrons in nano – scale materials. CO 2 - To explain the variation in the electron distribution in nanostructures for different dimensions (Quantum well, Quantum wires & quantum dots). CO 3 - To analyze magneto electronics and applications of nanotechnology in various fields. CO 4 - To explain laser effect in quantum well, quantum wires and quantum dots.
136	PP2046	Elective IV – (c) X-ray Crystallography					PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1- To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations.PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics.PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the sources and diffraction of X – rays. CO 2 - To acquire the basic knowledge on crystal systems and various properties of crystals. CO 3 - To explain the crystallographic data collection tools and intensity measurement method. CO 4 - To analyse the structure factor and intensity of diffracted peaks. CO 5 - To obtain the refined crystal structure by applying mathematical calculations.
137	PP20P3	Practical III – Advanced Physics Lab – III(Electronics)					PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 6 - To utilize the obtained scientific knowledge to create eco- friendly environment.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, MonoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To analyse the working of code converters (BCD / Gray, excess 3). CO 2 - To design various synchronous and asynchronous sequential circuits and study their working. CO 3 - To analyse the applications of op – amps (sine, triangular wave generator, low, high and band pass filters). CO 4 - To analyse the behavior of counters (up/down, mod, ring). CO 5 - To analyse the working of electronic circuits (multiplexer, demultiplexer, adder, subtractor).
138	PP20P4	Practical IV -Advanced Physics Lab – IV (Microprocessor and Micro Controller)					PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 6 - To utilize the obtained scientific knowledge to create eco- friendly environment.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To experiment with assembly language programming on 8085 microprocessor (Addition, Subtraction, Multiplication & Division). CO 2 - To apply assembly language programming on microprocessor (Data Manipulation, square of numbers, counters). CO 3 - To analyse the interfacing of microprocessor 8085 with I/O devices (AD & DA, Stepper motor). CO 4 - To apply assembly language programs for 8051 microcontroller.
139	PP20S2	Self Learning Course: Physics for Lectureship Examination – II					PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations.PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics.PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the physical construction, working and operational characteristics of semiconductor devices. CO 2 - To attain knowledge on the structure and dynamics of the molecules through various theories. CO 3 - To develop analytical thinking to understand the phenomenon that decide various properties of solids. CO 4 - To know the scientific, environmental and technological applications of nuclear Physics. CO 5 - To study the fundamentals of wave mechanics.
								2021-2022	
140	PC2011	Major Core I - Mechanics					PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze their observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand and define the laws involved in mechanics. CO 2 - To apply conservation laws in collision experiments. CO 3 - To interpret the principles of gravitation and moment of inertia through theory and experiments. CO 4 - To analyze the fundamentals of center of mass and rocket motion. CO 5 - To apply pressure-velocity relation in fluid flow in the field of fluid dynamics. CO 6 - To understand and define the laws involved in mechanics. CO 7 - To apply conservation laws in collision experiments.
141	AP2011	Allied I- Allied Physics I for Mathematics					PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To acquire knowledge on elementary ideas of electricity and magnetism, electronics, optics and nuclear Physics. CO 2 - To analyze the concepts and study their applications in the field of electricity and magnetism, electronics, optics and nuclear Physics. CO 3 - To apply their depth knowledge of Physics in day today life. CO 4 - To analyze the fundamentals of center of mass and rocket motion. CO 5 - To develop their knowledge and carry out the practical by
142	PNM201	Ivon Major Elective (NME) – Physics in Everyday Life I					JPO 1 - 10 apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	1750 1 - 10 understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - 10 understand their knowledge of basic scientific principles and fundamental concepts in Physics. CO 2 - To recall the various phenomena of sound waves applied in day today life. CO 3 - To understand the basic laws of Physics and different forces involved in nature. CO 4 - To explain the Physics concepts behind the sports. CO 5 - To categorize different characteristic nature of light and its properties like refraction, reflection and diffraction.

143	PC2021	Major Core II –Properties of matter and Sound			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To identify the materials suitable for construction of buildings, based on the moduli of elasticity. CO 2 - To paraphrase the properties of liquids and its determination. CO 3 - To analyze the Physics of sound and its applications. CO 4 - To integrate the concepts of acoustic comfort and better understanding of the theories used in building acoustics.
144	AP2021	Allied II – Allied Physics II for Mathematics			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To acquire knowledge on elementary ideas of electricity and magnetism, electronics, optics and nuclear Physics. CO 2 - To analyze the concepts and study their applications in the field of electricity and magnetism, electronics, optics and nuclear Physics. CO 3 - To apply their depth knowledge of Physics in day today life. CO 4 - To develop their knowledge and carry out the practical by applying these concepts.
145	PNM202	Non Major Elective (NME)– Physics in Every Day Life II			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the principle and working of simple devices used in day to day life. CO 2 - To identify the symbols used for various electronic components and infer the electronic tools. CO 3 - To distinguish different heavenly bodies (star, planet, comets, galaxies). CO 4 - To recall various applications of Physics concepts in everyday life.
146	PC20P1	Major Practical I - Physics Lab I			[PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 4 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To acquire knowledge on elementary ideas of electricity and magnetism, electronics, optics and nuclear Physics. CO 2 - To analyze the concepts and study their applications in the field of electricity and magnetism, electronics, optics and nuclear Physics. CO 3 - To apply their depth knowledge of Physics in day today life. CO 4 - To develop their knowledge and carry out the practical by applying these concepts.
147	AP20P1	Allied Practical – General Physics Lab			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To acquire knowledge on elementary ideas of electricity and magnetism, electronics, optics and nuclear Physics. CO 2 - To analyze the concepts and study their applications in the field of electricity and magnetism, electronics, optics and nuclear Physics. CO 3 - To apply their depth knowledge of elasticity. CO 4 - To develop their knowledge and carry out the practical by applying these concepts.
148	PC2031	Major Core III – Heat and Thermodynamics			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand experimental methods to determine the transmission of heat. CO 2 - To analyze the work and heat interactions associated with a prescribed process path and to perform analysis of a flow system. CO 3 - To understand the basic concepts of thermodynamics like system, properties, equilibrium, pressure, specific volume, temperature and the laws of thermodynamics. CO 4 - To evaluate entropy changes in a wide range of processes and determine the reversibility or irreversibility of a process from such calculations.
149	PC2032	Major – Elective - I a) Non Conventional Energy Sources			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 4 - To reflect upon green initiatives and take responsible steps to build a sustainable.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To apply the solar energy in various sectors. CO 2 - To explain the basic principles of wind energy conversion, various biomass conversion processes and its classification. CO 3 - To discuss the geothermal energy resources and chemical energy resources (fuel cells). CO 4 - To solve the present and future energy crisis.
150	PC2033	Major – Elective - I b) Fundamentals of Physics - I			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the fundamentals of dynamics. CO 2 - To determine the behavior of a ray at any optical surface (lenses, Prisms). CO 3 - To outline the extraction of useful energy from earth, ocean, wind and sun. CO 4 - To determine the significance of steady current and alternating current. CO 5 - To apply kirchoff's laws to simple electrical circuits.
151	PC2034	Major – Elective - I c) Microprocessor Fundamentals			[PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To know the basic ideas on microprocessor, memory and I/O devices. CO 2 - To be familiar with the basic concepts of microprocessor architecture and interfacing. CO 3 - To acquire skills in the programming instruction sets of microprocessors. CO 4 - To apply the programming instructions to perform simple programs using microprocessor.
152	Ar2031	Anned I – Alhed Physics I for Chemistry		J	PO 1 - 10 apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - 10 understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - 10 understand various modulus involved in the materials, flow of liquids due to viscous forces, transmission of heat due to process of conduction, convection and radiation and various laws involved in heat transformation, various thermodynamic laws. CO 2 - To analyze the concepts and study the concept of entropy, and the phenomenon like interference and diffraction, optical activity of liquids and its uses. CO 3 - To apply their depth knowledge of Physics in day today life. CO 4 - To develop their knowledge and carry out the practical by

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153	PC20S1	Self Learning Course - Physics for Competitive Examination - I	(PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. PO 7 - To equip students with hands on training through various courses to enhance	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2- To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3- To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4- To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5- To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To recall the principles of mechanics and conservation laws. CO 2 - To understand the concept of fluid dynamics. CO 3 - To categorize different kinds of oscillations. CO 4 - To examine the various aberrations and geometry involved in optics. CO 5 - To apply the laws of thermodynamics on heat phenomena.
154	PC2041	Major Core IV – Optics and Spectroscopy	V			PO 1 - 10 apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - 10 understand the core theores and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - 10 understand the knowledge of geometric optics is helps in the practical design of many optical systems and instruments including aberrations in lens system. CO 2 - To determine the behavior of a ray and wave at any optical surface. CO 3 - To analyze the intensity variation of light due to polarization, interference and diffraction. CO 4 - To study of phenomena interference, diffraction, and polarization lays the foundation for an understanding of concepts such as holograms, interferometers.
155	PC2042	Major – Elective - II a) Computer Programming in C++				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the different types of operators and expressions in C++ language. CO 2 - To implement different operation an arrays and use function to solve the given problem. CO 3 - To understand member functions and constructors. CO 4 - To analyze pointers, operator overloading and inheritance. CO 5 - To analyze input/output operations.
156	PC2043	Major – Elective - II b) Medical Physics				PO 1- To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the Anatomical terms of the body. CO 2 - To explain the physical dynamics of the body. CO 3 - To analyse the heat and pressure system of the body. CO 4 - To discuss the optical and electrical behavior of the human body. CO 5 - To gain knowledge and application ideas regarding diagnostic systems.
157	PC2044	Major – Elective - II c) Optoelectronics	Ø			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To explain the various methods of propagation of light waves through various types of fibres. CO 2 - To understand the basic concepts of fiber optics and types of fibers. CO 3 - To explain the structure and performance of LEDS and Lasers. CO 4 - To classify the optical sources and detectors and to discuss their principle. CO 5 - To discuss the channel impairments such as losses and dispersion. CO 6 - To analyse various coupling losses.
158	AP2041	Allied II – Allied Physics II for Chemistry	Ø			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To acquire knowledge on elementary ideas of electricity and magnetism, electronics, atomic and nuclear Physics. CO 2 - To analyze the concepts and study their applications in the field of electricity and magnetism, electronics and nuclear Physics. CO 3 - To apply their depth knowledge of Physics in day today life. CO 4 - To develop their knowledge and carry out the practical by applying the concepts of a rectifier, amplifiers and oscillator, basic digital electronics principles through logic gates and the laws governing them.
159	PC20P2	Major Practical II - Physics Lab II	Ø			PO 1- To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand the scientific method and an ability to apply the scientific method in practice. CO 2 - To recall the basic experiments; improve the basic skills and attitude which help them to apply these skills in their field of Physics. CO 3 - To understand the practical knowledge of various bridges (Desauty's and Owen's bridge) by demonstration of experiments. CO 4 - To verify the Thevenins and Nortons theorem. CO 5 - To 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. CO 6 - To analyze the physical principle involved in the various
160	AP20P1	Allied Practical – General Physics Lab				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze their localyze the results with theoretical expectations.	CO 1 - To understand the basic principles of Physics through experiments. CO 2 - To measure and determine the various physical parameters. CO 3 - To develop an idea about the handling of various instruments. CO 4 - To get an idea about basic scientific knowledge and implications of its broad working principle. CO 5 - To analyce, interpret and evaluate data. CO 6 - To build a foundation in scientific career.
161	PC20S2	Self Learning Course: Physics for Competitive Examination – II				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. PO 7 - To equip students with hands on training through various courses to enhance	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To discuss the principles and generation of electric charges. CO 2 - To classify the different types of magnetic materials. CO 3 - To correlate the mechanisms involved between magnetism and electricity. CO 4 - To discuss the principles behind the phenomena of atomic Physics and nuclear reactions. CO 5 - To apply the laws of thermodynamics on heat phenomena. CO 6 - To apply the laws of thermodynamics on heat phenomena. CO 7 - To recognize the elements of microprocessors and computers.

162	PC1751	Major Core V - Element of Modern				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To davalon extensive comprehension of fundamental and diverse.	CO 1 - To explain the theories and experiment related to particle and wave nature of particles.
		n ayawa				laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other	applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.	effect, planks law, Compton effect, photoelectric effect) and wave nature experiments. (Thomson experiment, division germer experiment).
						institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science.	PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6. To communicate appropriately and effectively in a scientific	CO 3 - To define uncertainty principle. CO 4 - To analyse various models of atomic spectra. CO 5 - To solve schrodinger equation in different dimensional
						and education.	 PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent. 	CO 6 - To estimate lorentz transformation for length contraction, time dilation.
163	PC1752	Major Core VI - Optics			20	PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse	CO 1 - To explain the fundamental principle of optics. CO 2 - To determine the behavior of a ray at any optical surface (lenses, Prisms).
						laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the	CO 5 - 10 explain the types of waves and its characteristics. CO 4 - To analyze the intensity variation of light due to polarization,interference and diffraction. CO 5 - To distinguish interference, diffraction and polarization. CO 6 - To test the optical planeness of any optical surface. CO 7 - To measure the various optical parameters (focal length, power, refractive index, radius of curvature, dispersive power etc) using optical components (prism, lenses, glass plate, grating). CO on a T
164	PC1752	Major Com VII Solid			6	PO 1. To apply the acquired scientific knowledge	professional requirement and become self-dependent.	CO 8 - To understand the interference and diffraction from wave optics concepts and know its applications.
104	PC1/33	Mappi Core vi i Sond State Physics				PO 1 - 10 apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 = 10 understand une core incortes and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - 10 must are various types of olonging present in solutions withexample. CO 2 - To explain the various crystal parameters and structures. CO 3 - To discuss the various theories involved in magnetic materials. (dia, para, ferro, ferri and antiferro magnetism) CO 4 - To describe polarization processes and analyze the information contained in the temperature and frequency dependence officienctic materials. CO 5 - To analyze the structure and physical properties of semiconductors. CO 6 - To describe and discuss the theory of superconductivity and superconducting materials.
165	PC1754	Major – Elective - III (a) Programming with C++			R	 PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. 	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To oreal, national and global impact.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To describe the principles of object oriented program. (abstraction, encapsulation, inheritance and polymorphism). CO 2 - To apply object oriented programming techniques to solve computing problems. CO 3 - To develop programs using functions and classes. (objects, array of objects, friend functions, passing and returning objects) CO 4 - To develop programs using constructor, destructor, operator overloading and inheritance. CO 5 - To formulate the applications of pointers and virtual functions. CO 6 - To distinguish formatted and unformatted I/O operations.
166	PC1755	Major – Elective - III (b) Applied Physics			ē	PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse	CO 1 - To understand the general Physics principles of instruments used in the medical field. CO 2 - To explain the use of non ionizing radiation in imaging the
						laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using measure therbogore.	body. CO 3 - To outline various features and behavioral activity of the Sun and heavenly bodies of solar system. CO 4 - To discuss the transformation and characteristics of fiber and its manufacturing techniques. CO 5 - To interpret the techniques.
							PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 6 - To explain the principles, concepts and operation of satellite communication.
167	PC1756	Major – Elective - III (c) Bio Physics				PO 1- To apply the acquired scientific knowledge to face day to day needs. PO 2- To create innovative ideas through laboratory experiments. PO 3- To carry out field works and projects independently and in collaboration with other institution. PO 5- To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To explain atomic and molecular structure of biomolecules. CO 2 - To interpret the structure of cells and the major components within a cell. CO 3 - To discuss the importance of diffusion, random walks, entropyand self-assembly in biological systems. CO 4 - To illustrate the models of cellular dynamics. CO 5 - To describe stem cell and brain structure; Explain the core concepts of biological literacy. (evolution,biological structure-function relationships, information flow pathways and transformations of energy and matter).
168	PSK175	Skill Based Course - Basic electric circuits and Applications		2 V		PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To recall the basic definitions and units of electrical quantities. CO 2 - To analyze the circuit elements and their connections . CO 3 - To understand various power generation methods. CO 4 - To develop their own circuits using electrical viring. CO 5 - To compare the Physics concepts behind various electrical instruments and appliances. (Voltmeter, Ammeter, Multimeter, Incandescent lamp, Fluorescent bulb, Choke and Starter, Electric Iron). CO 6 - To demonstrate uses of tester & Multimeter, LDR, Microphone, loudspeaker, etc CO 7 - To test for the working of electrical circuits and
169	PC1761	Major Core VIII - Mathematical Methods of Physics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To oreal, national and global impact.PSO 4 - To oronumnicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To illustrate linear dependence and combination of vectors as quantities in Physics. CO 2 - To evaluate problems in matrices. CO 3 - To solve ordinary and partial differential equations related to Physical Science. CO 4 - To adapt Fourier transform technique to obtain the Fourier series of periodic functions of Physics. CO 5 - To understand and manipulate random variables using the theory of probability including tools of probability transformation and characteristic functions.

170	PC1762	Major Core IX - Digital			PO 1 - To apply the acquired scientific knowledge	PSO 1 - To understand the core theories and principles of Physics which	CO 1 - To understand the fundamental concents and techniques
	POINT	System and Application			PO 1 - TO see by the sequence account in writing to face day to day needs. PO 2 - TO create innovative ideas through laboratory experiments. PO 3 - TO carry out field works and projects independently and in collaboration with other institution. PO 5 - TO face challenging competitive examinations that offer rewarding careers in science and education.	include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	Les 1 is unstream to the maintenan concepts and techniques used in digital electronics. CO 2 - To perform conversions among different number systems and apply in digital designing. CO 3 - To infer the basic logic gates, understand boolean algebra and simplify simple boolean functions by using basic boolean properties. CO 4 - To understand, analyse and design various combinational and sequential circuits. (Flip hop, Counters, MUX, DEMUX, Encoder, Decoder etc.). CO 5 - To understand the architecture and operations of microprocessor 8085. CO 6 - To develop the basic idea about the instruction set and data
1/1	PC1763	Major Core X - Nuclear Physics			PO 1 - 10 apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - 10 understand the core theores and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - 10 define the fundamentals of nuclear matter. (properties of nuclear for nuclear forces). CO 2 - To apply the principles of Physics in the measurements of nuclear size, nuclear spin, nuclear energy levels and nuclear magnetic moment. CO 3 - To assess radioactivity and various nnuclear reactions. (nuclear fission and fusion). CO 4 - To explain the decay modes, radiation detectors and particle accelerators. (ionisation chamber, proportional counter, geiger multer counter, linear accelerator, cyclotron, synchro cyclotron, betatron). CO 5 - To discuss the classification of elementary particles and quark model. CO 6 - To analyse the characteristics and behavior of elementary
172	PC1764	Major – Elective - IV (a) Nanomaterials and its applications			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To infer the history of nanotechnology and explain the various dimensions of nanostructures. CO 2 - To apply the characterization techniques of nanomaterials.(XRD,SEM,TEM and Analytical Electron Microscope). CO 3 - To explain the synthesis of nanomaterials and categorize their properties. CO 4 - To interpret quantum well, quantum wires and quantum dots. CO 5 - To explain the carbon nanotubes and its applications. CO 6 - To discuss the applications of nanotechnology in various fields.
173	PC1765	Major – Elective - IV (b) Basic AstroPhysics			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To devolop entropreneutial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To identify the historical evolution of sun and planets. CO 2 - To apply the principles of Physics in the measurements of distances,mass, radius, density and luminosity of stars. CO 3 - To compare the resolving power and light gathering power of an astronomical telescope. CO 4 - To explain the physical characteristics of sun and other stars. CO 5 - To analyse the structure of the universe and milky way galaxy. CO 6 - To discuss the observations of Galaxies, dark matter, quasars and puskars. CO 7 - To develop a deeper understanding of some important
174	PC1766	Major – Elective - IV (c) Digital Signal Processing			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To formulate discrete time signals, evaluate their energy and power, check for periodicity and evaluate the period of a signal. CO 2 - To identify properties of discrete time systems. (stability, causality,invertibility). CO 3 - To evaluate discrete-time Fourier transform. (DTFT) of a sequence. CO 4 - To compute the linear and circular convolution of discrete- time sequences. CO 5 - To estimate the z-transform of a sequence, identify its region of convergence and compute the inverse Z- transform. CO 6 - To evaluate the discrete Fourier transform (DTFT) of a sequence, relate it to the DTFT and use the DTF to compute the
175	PC17P5	Major Practical V - Physics Lab V			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To crave innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneural skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To demonstrate the experimental techniques and develop competence in handling optical instruments. CO 2 - To demonstrate an understanding of the scientific method and apply it in practice. (a familiarity with optics). CO 3 - To analyse the diffraction and dispersion phenomena in optical elements (grating or prism) using spectrometer. CO 4 - To measure the various optical parameters (focal length, dispersive power, refractive index, radius of curvature, minimum deviationetc) using optical elements. (prism and grating). CO 5 - To develop practical hands-on experience applying widely used techniques to investigate optical plenema. (oblique incidence, Normal Incidence, i – d curve, Hyperbolic fringes and Elliptical fringes).
176	PC17P6	Major Practical VI - Physics Lab VI			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To demonstrate the experimental techniques and develop competence in handling optical instruments. CO 2 - To demonstrate an understanding of the scientific method and apply it in practice. (a familiarity with optics). CO 3 - To analyse the diffraction and dispersion phenomena in optical elements (grating or prism) using spectrometer. CO 4 - To measure the various optical parameters (focal length, dispersive power, refractive index, radius of curvature, minimum deviation etc) using optical elements. (prism and grating) CO 5 - To develop practical hands-on experience applying widely used techniques to investigate optical phenomena. (oblique incidence,Normal Incidence, i – d curve, Hyperbolic fringes and Elliptical fringes). CO 6 - To record, analyze, interpret and critically evaluate

177	PC17P7	Major Practical VII -			PO 1 - To apply the acquired scientific knowledge	PSO 1 - To understand the core theories and principles of Physics which	CO 1 - To understand the principles of object oriented program to
		Physics Lab VII			 PO 1 To apply the acquired sectimize intowedge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. 	130 1 To that can be considered and principles of Tiplate where the include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 = 10 dinkt sinual the principles of object of internet program to construct computer programs and modeling of experimental data for the solution of problems in Physics. (period of a pendulum and Young's modulus of a material): Apply object oriented programming techniques to solve computing problems. (addition, subtraction, multiplication and division). CO 2 - To develop programs using functions and classes. (objects, array of objects, friend functions, passing and returning objects,function declaration with/without using the return statement). CO 3 - To formulate the applications of pointers and virtual functions . CO 5 - To develop programs using constructor, destructor, operator overloading and inheritance. (generate a series of
178	PSK176	SBC -Project			IPO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply knowledge of principles, and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To devlop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To analyze a research problem and construct tools for data collection. CO 3 - To analyze a research problem and construct tools for data collection. CO 3 - To write research reports and present results in the scientific community. CO 4 - To develop skills to serve in science related industries and agencies. CO 5 - To develop skills to publish articles in reputed journals.
179	PC17S1	Self Learning Course - Physics for Competitive Examination - I	Ø		PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To recall the principles of mechanics and conservation laws:understand the concept of fluid dynamics. CO 2 - To examine the various aberrations and geometry involved in optics. CO 3 - To apply the laws of thermodynamics on heat phenomena.
180	PC17S2	Self Learning Course - Physics for Competitive Examination - II	Ø		PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To recall the principles of mechanics and conservation laws:understand the concept of fluid dynamics. CO 2 - To examine the various aberrations and geometry involved in optics;apply the laws of thermodynamics on heat phenomena.
181	PP2011	Core I – Classical Mechanics			 PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. 	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Qantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Nitroprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To acquire skills in performing advanced Physics experiments unclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the basic mechanical concepts related to single andsystem of particles. CO 2 - To apply various mechanical principles to find solution for physicalproblems. CO 3 - To solve the equations of motion using Lagrangian, Hamiltonian andHamilton–Jacobi equations. CO 4 - To explain the origin of coriolis and centrifugal terms in the equation ofmotion in a rotating frame . CO 5 - To understand and develop a scientific knowledge in central force problems and relativity.
182	PP2012	Core II – Mathematical Physics			 PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. 	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, ManoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the inmact of Physics in a elobal, economic,	CO 1 - To apply the various theorems in complex analysis to evaluate definite integrals. CO 2 - To determine the series solutions and the recurrence relations(Bessel, Legendre and Hermite differential equations) and solve problems associated with them. CO 3 - To discuss the basic principles and methods used for the analysis of partial differential equations and apply the techniques to related problems . CO 4 - To discuss the concepts of Fourier, Laplace and inverse Laplace transform, tensors, group theory and their properties. CO 5 - To develop expertise in mathematical techniques required in Physics and to enhance problem solving skills.
183	PP2013	Core III – Quantum Mechanics– I		6	PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	 PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 4 - To demostrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in global, economic, 	CO 1 - To summarize the concept of wave function and the postulates of quantum mechanics. CO 2 - To formulate time dependent and time independent equationand solve them for simple potentials. CO 3 - To evaluate the eigen values and eigen function spin and totalangular momenta and determine the matrices. CO 4 - To analyze the principles of quantum theory, equation of motion, scattering theory and angular momentum.

184	PP2014 PP2015	Elective I – (a) Advanced Nuclear Physics Elective I – (b) Molecular Physics		 PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in 	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, ManoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations.PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations.PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics.PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 1 - To understand the impact of Physics in a global, economic, PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).	CO 1 - To understand the basic knowledge on nuclei and neutron to know other factors like properties and scattering. CO 2 - To examine the neutron interactions to formulate probability.Diffusion, Fermi- age equations. CO 3 - To analyse the working of nuclear reactors and its reaction toproduce nuclear energy. CO 4 - To study the nuclear fusion reaction and apply its principle forstellar energy. CO 1 - To understand the chemical bonding of molecules and various theories of homo and hetero nuclear diatomic molecules. CO 2 - To analyze the symmetry operations and molecular orbital theory. CO 3 - To analyze the electronic properties of molecules,
				industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	Newtonian and Hamiltonian dynamics and Phase space trajectories. CO 4 - To understand the molecular collisions and different energies caused by reactive collisions. CO 5 - To evaluate the transport of electron and the formation of electronic bands and spectra.
186	PP2016	Elective I – (c) Numerical Methods		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have vell-defined knowledge on theoretical concepts and experimental methods of advanced Physics, Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations.PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic, environmental, and societal context.	CO 1 - To apply various interpolation methods and finite difference concepts. CO 2 - To analyze the numerical solutions of linear and non linearequations. CO 3 - To utilize various numerical methods for differentiationand integration. CO 4 - To solve ordinary differential equations whenever and wherever routine methods are not applicable.
187	PP2021	Core IV – Electromagnetic Theory		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To summarize the fundamental laws of electrodynamics basedon Maxwell's equations. CO 2 - To enumerate the concept of energy in electrostatic and magnetostatic fields. CO 3 - To illustrate the electrical properties of materials. CO 4 - To solve the wave equation as plane waves in source. CO 5 - To analyze the wave polarization and reflection/transmission ofplane waves in homogenous media.
188	PP2022	Core V – Quantum Mechanics- II	0	PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have vell-defined knowledge on theoretical concepts and experimental methods of advanced Physics, (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Nicroprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To enumerate time independent perturbation theory and use approximation methods. (variation principle and WKB method) to solve simple problems (ground state helium, barrier penetration, etc). CO 2 - To analyze time dependent perturbation theory to discuss absorption and emission of radiation forharmonic perturbation. CO 3 - To interpret quantum theory of atomic and molecular structure. CO 4 - To formulate Klein–Gordan and Dirac equations and discuss the applications. (particle in a Coulomb field, Spin of electron).
189	PP2023	Core VI – Condensed MatterPhysics– I		PO 1- To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have vedl-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To differentiate between different lattice types and explain the concepts of reciprocal lattice and crystal diffraction. CO 2 - To analyze various crystal imperfections and ordered phases of crystal. CO 3 - To explain the theory of lattice vibrations and analyze the thermal properties of solids. CO 4 - To formulate the problem of electrons in a periodic potential.
190	PP2024	Elective II – (a) Experimental design		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy. Integrated Electronics, AstroPhysics, Molecular Spectroscopy. Integrated Electronics, AstroPhysics, PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To understand the principle and working of transducers. CO 2 - To examine the measurement systems and errors in it. CO 3 - To analyse the X ray measurements and to find TEM, SEM,EDS, FESEM, AFM, UV Vis, IR, FTIR characterizations. CO 4 - To get an introduction and idea on optical fibres.

191	PP2025	Elective II – (b) Introductory Astronomy, Astro Physics& Cosmology Elective II – (c) Laser Physics			 PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academin, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To pray and practical knowledge to solve the problems of the society. PO 3 - To pray and practical knowledge to solve the problems of the society. PO 3 - To pray and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. 	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To apply and interpret Physics in a global, economic, PSO 4 - To apply and interpret Physics in a global, economic, PSO 1 - To understand the impact of Physics in a global, economic, PSO 1 - To nave well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics, PSO 3 - To acquire skills in gerforming frontiers of Physics, PSO 4 - To apply and interpret Physics principles in various physical oncepts using modern technology and numerical simulations. PSO 3 - To acquire skills in performing davanced Physics, PSO 4 - To apply and interpret Physics principles in various physical	 CO 1 - To perceive the historical evolution of solar system and universe. CO 2 - To describe the principles of Physics in the formation of astronomical objects like planets, satellites, asteroids and comets. CO 3 - To gain experience with measurement techniques and equipment and develop the ability to assess certainties and assumptions. CO 4 - To interpret the observations of galaxies, dark matter, quasars and pulsars. CO 5 - To achieve a good understanding of physical laws and principles in cosmology. CO 1 - To develop knowledge in the basics of lasers. CO 2 - To enhance comprehension in the principles of lasers. CO 4 - To familiarize with the diverse applications of lasers.
193	PP20P1	Practical I – Advanced Physics Lab – I (General Physics)		0	PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 6 - To utilize the obtained scientific knowledge to create eco- friendly environment.	observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic, PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Mathematical Physics, Quantum Mechanics, Solid State Physics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To acquire skills in performing advanced Physics, PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving	CO 1 - To demonstrate practical skills to work with complex problems and advanced experimental equipment. CO 2 - To develop a practical knowledge in Hall Effect and in determination of Magneto resistance. CO 3 - To develop practical experience in LASER experiments. CO 4 - To measure and compare the dielectric constant of various liquids. CO 5 - To apply Ultrasonic Interferometers to determine thevelocity of sound.
194	PP20P2 PP2031	Practical II – Advanced Physics Lab – II (Programming with C++) Core VII – Electronics			PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 6 - To utilize the obtained scientific knowledge to create eco- friendly environment. PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge	scientific problems. PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, NanoPhysics, Nature Mechanics, Solid State Physics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills marging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 7 - To understand the impact of Physics in a global, economic, PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Pso 4 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics.	CO 1 - To understand the basic concept of Object OrientedProgramming (OOP). CO 2 - To interpret the theoretical formulation for physical phenomena and apply experimental numerical. CO 3 - To simulations methods to find the solution. CO 4 - To apply computational methods and numerical algorithms to problems in advanced Physics using C++ programming. CO 5 - To develop a basic knowledge in high level programming languages. CO 1 - To understand the basic operation, and features related to diodes, transistor, op- amps, converter and interpret. CO 2 - To explain about the internal circuitry and logic behind
					to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	Molecular Spectroscopy, Integrated Electronics, Astrophysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	semiconductor memory devices. CO 3 - To assess the working of diodes, transistor, op– amps and converters. CO 4 - To design various filter circuits.
196	PP2032	(Core VIII – Condensed MatterPhysics – II			(FO 1-10 recognze the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	(FSO 1 - 10 nave well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 4 - To denonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - 10 understand the theory of dielectrics and analyze thedielectric properties of materials. CO 2 - To explain various types of magnetic phenomenon andtheir properties and applications. CO 3 - To elaborate the properties and applications. CO 4 - To apply the obtained concepts to challenges.
197	PP20PR	Research Project			PO I - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To explore new areas of research in Physics. CO 2 - To analyze a research problem and construct tools for data collection. CO 3 - To write research reports and present results in the scientific community. CO 4 - To develop skills to serve in science related industries and agencies. CO 5 - To develop skills to publish articles in reputed journals.

198	PP2033	Elective III – (a) BioPhysics Elective III – (b) Microprocessor and Microcontroller		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurila pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 4 - To apply and interpret Physics in a global, economic, PSO 4 - To apply and interpret Physics in a global, economic, PSO 4 - To apply and interpret Physics in a global, economic, PSO 1 - To understand the impact of Physics in a global, economic, PSO 1 - To have well-defined knowledge on thoretical concepts and experimental methods of advanced Physics, Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy. Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics, Classical Mechanics, PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physical observations. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To understand the basic structural unit and its different types. CO 2 - To acquire the basic knowledge on various microscopes used to analyse the structure. CO 3 - To analyse the structure of DNA, RNA and proteins. CO 4 - To explain the techniques used to separate the biomolecules. CO 5 - To determine the interaction of molecules by using different optical and diffraction techniques. CO 1 - To identify the operation of various components of the microprocessor 8085 and microprocessor 8086. CO 2 - To relate and explain the various addressing modes and the instruction set of 8085 microprocessor. CO 3 - To develop skill in writing simple programs for 8085 microprocessor. CO 4 - To explain the architecture of 8051 microcontroller. CO 5 - To understand the various interrupts of 8085 microprocessor.
200	PP2035	Elective III – (c) Solar Energy Utilization		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 6 - To utilize the obtained scientific knowledge to create eco- friendly environment.	PSO 1 - 10 understand ne impact of Physics in a global, economic, PSO 1 - 10 have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the basic concept of heat transfer. CO 2 - To design the solar collectors and solve the optical loss. CO 3 - To relate the different types of solar water heaters. CO 4 - To analyze the use of nanostructures and nanomaterials in fuel cell technology. CO 5 - To evaluate the photo voltaic principles and compare the types of solar cells.
201	PP20S1	Self Learning Course: Physics for Lectureship Examination – I		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, MonoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To familiarize with a range of mathematical methods that are essential for solving advanced problems in theoretical Physics. CO 2 - To model mechanical systems, both in inertial and rotating frames, using lagrange and hamilton equations. CO 3 - To gain nisight into the physical nature of electric and magnetic phenomena. CO 4 - To use quantum mechanical principles to analyze advanced physical phenomena of nature. CO 5 - To understand the theory and methods of statistical Physics and thermodynamics.
202	PP2041	Core IX – Nuclear and Elementary Particle Physics		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have vell-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the properties of nuclear forces and outline their behavioral formulation. CO 2 - To analyze the different nuclear models of the nucleus and examine the application of the shell model of nucleus. CO 3 - To explain the characteristics and effect of radioactive decay phenomena (alpha,beta,gamma)Discuss the outcome of various types of nuclear reactions. CO 4 - To examine the particle Physics phenomena and their basic theoretical description.
203	PP2042	Core X – Spectroscopy		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, MonoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To apply basic spectroscopic techniques. (Microwave, IR,Raman and NMR). CO 2 - To understand the molecular interactions in different spectroscopic methods. CO 3 - To analyze the characteristics of rotational spectra and vibrational energy of molecules. CO 4 - To utilize various spectroscopic methods suitable for characterizing molecules.
204	PP2043	Core XI —Thermodynamics and Statistical Mechanics		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the basic concepts related to thermodynamics, microstates and macrostates . CO 2 - To apply principles to find relation between grand canonical and canonical partition functions. CO 3 - To solve the boltzmann distributions bose– cinstein, fermi– dirac and maxwell. CO 4 - To analyze the origin of transport and non– equilibrium processes. CO 5 - To understand the concept of heat capacities and phasetransitions.

205	PP2044	Elective IV – (a) Materials Physics and Processing Techniques			PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Nicorporcessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physical observations.PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To remember basic principles in material Physics. CO 2 - To understand various material fabrication methods. CO 3 - To analyse different characterization used for materials processing. CO 4 - To apply different methods of material processing. CO 5 - To evaluate the materials and characterization tools.
206	PP2045	Elective IV – (b) Advanced Nano Physics			PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics, Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Nicorprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To identify how basic Physics can be used to describe thebehaviour of electrons in nano- scale materials. CO 2 - To explain the variation in the electron distribution in nanostructures for different dimensions(quantum well,quantum wires & quantum dots). CO 3 - To analyze magneto electronics and applications of nanotechnology in various fields. CO 4 - To explain laser effect in quantum well, quantum wires and quantum dots.
207	PP2046	Elective IV – (c) X-ray Crystallography	Ø		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To understand the sources and diffraction of X- rays. CO 2 - To acquire the basic knowledge on crystal systems and various properties of crystals. CO 3 - To explain the crystallographic data collection tools and intensity measurement method. CO 4 - To analyse the structure factor and intensity of diffracted peaks. CO 5 - To obtain the refined crystal structure by applying mathematical calculations.
208	PP20P3	Practical III– Advanced Physics Lab – III(Electronics)			PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 6 - To utilize the obtained scientific knowledge to create eco- friendly environment.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To analyse the working of code converters (BCD / gray, excess 3). CO 2 - To design various synchronous and asynchronous sequential circuits and study their working. CO 3 - To analyse the applications of op- amps (sine, triangular wavegenerator, low, high and band pass filters). CO 4 - To analyse the behavior of counters (up/down, mod, ring). CO 5 - To analyse the working of electronic circuits (multiplexer, demultiplexer, adder, subtractor).
209	PP20P4	Practical IV –Advanced Physics Lab – IV (Microprocessor and Micro Controller)			PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 6 - To utilize the obtained scientific knowledge to create eco- friendly environment.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To experiment with assembly language programming on 8085 microprocessor (addition, subtraction, multiplication &division). CO 2 - To apply assembly language programming on microprocessor (data manipulation, square of numbers, counters). CO 3 - To analyse the interfacing of microprocessor 8085 with I/O devices (AD& D/A, stepper motor). CO 4 - To apply assembly language programs for 8051 microcontroller.
210	PP20S2	Self Learning Course: Physics for Lectureship Examination – II			PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFFL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the physical construction, working and operational characteristics of semiconductor devices. CO 2 - To attain knowledge on the structure and dynamics of the molecules through various theories. CO 3 - To develop analytical tinking to understand the phenomenon that decide various properties of solids. CO 4 - To know the scientific, environmental and technological applications of nuclear Physics. CO 5 - To study the fundamentals of wave mechanics.
						2020-2021	
211	PC2011	Major Core I - Mechanics			[PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand and define the laws involved in mechanics. CO 2 - To apply conservation laws in collision experiments. CO 3 - To interpret the principles of gravitation and moment of inertia through theory and experiments. CO 4 - To analyze the fundamentals of center of mass and rocket motion. CO 5 - To apply pressure velocity relation in fluid flow in the field of fluid dynamics. CO 6 - To understand and define the laws involved in mechanics. CO 7 - To apply conservation laws in collision experiments.
212	AP2011	Allied I- Allied Physics I for Mathematics	Y		IPO 1- To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze their berverved experimental data and relate the results with theoretical expectations.	CO 1 - To acquire knowledge on elementary ideas of electricity and magnetism, electronics, optics and nuclear Physics. CO 2 - To analyze the concepts and study their applications in the field of electricity and magnetism, electronics, optics and nuclear Physics. CO 3 - To apply their depth knowledge of Physics in day today life. CO 4 - To analyze the fundamentals of center of mass and rocket motion. CO 5 - To develop their knowledge and carry out the practical by a construction.

213	PNM201	Non Major Elective (NME) – Physics in Everyday Life I				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To nalyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To understand their knowledge of basic scientific principles and fundamental concepts in Physics. CO 2 - To recall the various phenomena of sound waves applied in day today life. CO 3 - To understand the basic laws of Physics and different forces involved in nature. CO 4 - To explain the Physics concepts behind the sports. CO 5 - To categorize different characteristic nature of light and its properties like refraction, reflection and diffraction.
214	PC2021	Major Core II —Properties of matter and Sound				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2- To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To identify the materials suitable for construction of buildings, based on the moduli of elasticity. CO 2 - To paraphrase the properties of liquids and its determination. CO 3 - To analyze the Physics of sound and its applications. CO 4 - To integrate the concepts of acoustic comfort and better understanding of the theories used in building acoustics.
215	AP2021	Allied II – Allied Physics II for Mathematics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To acquire knowledge on elementary ideas of electricity and magnetism, electronics, optics and nuclear Physics. CO 2 - To analyze the concepts and study their applications in the field of electricity and magnetism, electronics, optics and nuclear Physics. CO 3 - To apply their depth knowledge of Physics in day today life. CO 4 - To develop their knowledge and carry out the practical by applying these concepts.
216	PNM202	Non Major Elective (NME)– Physics in Every Day Life II				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze physics.PSO 5 - To nanlyze their local experimental data and relate the results with theoretical expectations.	CO 1 - To understand the principle and working of simple devices used in day to day life. CO 2 - To identify the symbols used for various electronic components and infer the electronic tools. CO 3 - To distinguish different heavenly bodies (star.planet.comets, galaxies). CO 4 - To recall various applications of Physics concepts in everyday life.
217	PC20P1	Major Practical I - Physics Lab I				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 4 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.	CO 1 - To acquire knowledge on elementary ideas of electricity and magnetism, electronics, optics and nuclear Physics. CO 2 - To analyze the concepts and study their applications in the field of electricity and magnetism, electronics, optics and nuclear Physics. CO 3 - To apply their depth knowledge of Physics in day today life. CO 4 - To develop their knowledge and carry out the practical by applying these concepts.
218	AP20P1	Allied Practical – General Physics Lab				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects in collaboration with other institution. PO 7 - To equip students with hands on training through various courses to enhance entrepreneurship skills.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To nanlyze their observed experimental data and relate the results with theoretical expectations.	CO 1 - To acquire knowledge on elementary ideas of electricity and magnetism, electronics, optics and nuclear Physics. CO 2 - To analyze the concepts and study their applications in the field of electricity and magnetism, electronics, optics and nuclear Physics. CO 3 - To apply their depth knowledge of Physics in day today life. CO 4 - To develop their knowledge and carry out the practical by applying these concepts.
219	PC1731	Major Core III – Electricity and Magnetism	V]	PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To explain the concept and features of the electrostatic force (coulomb force), magnetic field, flux, force, the electric force field, gauss's Law and its application (charged sphere, cylinder, plane sheet). CO 2 - To analyse the presence of electric potential and potential difference, within a framework of distributed symmetric charge distributions. CO 3 - To understand the laws of electromagnetic induction as applied to self and mutual induction. CO 4 - To analyse AC circuit behavior. (LR,CR and LCR). CO 5 - To apply kirchoff's laws and network theorems to electrical circuits.
220	PC1732	Major – Elective - I (a) Non – Conventional Energy Sources		N		PO 1- To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To understand the utilization of solar energy for generating the power. CO 2 - To apply the solar energy in various sectors. CO 3 - To explain the basic principles of wind energy conversion, its components and its classification. CO 4 - To explain the various biomass conversion Processes. CO 5 - To discuss the geothermal energy resources and chemical energy resources. CO 6 - To outline the extraction of useful energy from earth, ocean, wind and sun. CO 7 - To design the various pollution-free energy resources.(solar heater, solar cooker, wind mill etc).
221	PC1733	Major – Elective - I (b Medical Physics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entropreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To understand the anatomical terms of the body. CO 2 - To explain the physical dynamics of the body. CO 3 - To analyse the heat and pressure system of the body. CO 4 - To discuss the optical, electrical and acoustical behavior of the human body. CO 5 - To gain knowledge and application ideas regarding radiations and diagnostic systems. CO 6 - To identify the radiation units and will be able to measure the radiation dose.

222	PC1734	Major - Elective - I (c)			PO 1 - To apply the acquired scientific knowledge	PSO 1 - To understand the core theories and principles of Physics which	CO 1 - To understand the scientific ideas of how the universe
222	101154	Physics of Earth			10 1 - 10 app) in a equite scenario knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	100 14 To that's multiplication in the core means and principles of triples which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	$CO_{-1} = Volucies and the settermine decises of now the universe formed and how in its expanding. CO_{-2} = To discuss the general characteristics and origin of universe. CO_{-3} = To explain the physical dimensions and the internal structure of the earth. CO_{-4} = To discuss the various regions in earth (hydrosphere, atmosphere, cryosphere and bio-sphere). CO_{-5} = To explain the dynamical processes that happen in earth. CO_{-6} = To explain the dynamical processes that happen in earth. CO_{-6} = To explain the dynamical processes that happen in earth. CO_{-6} = To explain the dynamical processes that happen in earth. CO_{-6} = To explain the dynamical processes at local to global scales. CO_{-7} = To discuss the evolution of life on earth and its role in the set of th$
223	PC17P3	Major Practical III - Physics Lab III			PO 1- To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To understand the scientific method and an ability to apply the scientific method in practice. CO 2 - To understand the theory of ballistic galvanometer by doing experiments. CO 3 - To recall the basic experiments. CO 4 - To improve the basic skills and attitude which help them to apply these skills in their field of Physics. CO 5 - To understand the practical knowledge of various bridges (desauty's and owen's bridge) by demonstration of experiments. CO 6 - To understand the practical knowledge of various bridges (desauty's and owen's bridge) by demonstration of experiments. CO 6 - To determine the resonant frequency and Q value of a series and parallel LCR circuit and be able to verify thethevinins and nortons theorem. CO 7 - To compile a record of an experiment in a clear and logical written form (e.g., lab manual report, Record) augmented with
224	AP1731	Allied II – Allied Physics - I (for II B.Sc Chemistry)			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneural skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To interpret simple systems undergoing simple harmonic motion and derive equations of motion. CO 2 - To demonstrate the bending moment diagrams (distinguish different type of bending). CO 3 - To explain the properties and behavior of fluids undervarious conditions. CO 4 - To distinguish between the characteristics and features of various phenomena of light, (interference, diffraction, polarization, double refraction, specific rotation). CO 5 - To analyze and study the applications of dispersion and refraction through a prism.
225	PC1741	Major Core IV – Analog System and Application	D		PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To understand the basics of semiconductor physics for intrinsic and extrinsic materials. CO 2 - To examine the operation, features and parameters related to diodes, transistor, and interpret their applications. (P-N diode, zener diode, transistor). CO 3 - To justify the function of semiconductor diodes in filter and bridge circuits. CO 4 - To design amplifier circuits with and without feedback. CO 5 - To analyse the different types of oscillators based on their circuit design LC,RC,RC phase shift, wien bridge, crystal. CO 6 - To analyse the characteristics and various applications of the op-amp.
226	PC1742	Major – Elective - II (a) Fibre Optics			PO 1- To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To explain the various methods of propagation of light waves through various types of fibres. CO 2 - To explain the structure and performance of LEDS and lasers. CO 3 - To classify the optical sources and detectors and to discuss their principle. CO 4 - To discuss the channel impairments such as losses and dispersion and analyse various coupling losses. CO 5 - To understand and compare operation, principles, characteristics, design architecture of modulators and detectors of light.
227	PC1743	Major – Elective - II (b) Microprocessor			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To explain the architecture of 8085 microprocessor. CO 2 - To analyze the instruction set of 8085 microprocessor. CO 3 - To develop skill in writing simple programs for 8085 microprocessor. CO 4 - To examine the programming techniques with additional instructions. CO 5 - To analyze the 8085 microprocessor applications. (counters and generation of waves forms).
228	PC1744	Major – Elective - II (c) Communication System			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To understand the basic ideas regarding modulation in communication system. CO 2 - To understand the frequency and pulse modulation and explain its detection. CO 3 - To identify and apply appropriate techniques, resources and to solve problems in mobile communication system. CO 4 - To develop the ideas in satellite communication. CO 5 - To apply the technical skills and modern tools in electronic communication systems.
229	PC17P4	Major Practical IV - Physics Lab IV			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneural skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To develop the basic experiments. CO 2 - To improve basic skills and attitude which help them to apply these skills in their field of Physics. CO 3 - To understand the principle and working of analog electronic circuits (zener diode, bridge rectifier) through some basic experiments. CO 4 - To analyze the physical principle involved in the various instruments and design simple circuits for amplifiers (single stage CE amplifier with and without feedback). CO 5 - To construct simple circuits containing operational amplifiers to a adder and subtractor, differentiator and integrator. CO 6 - To apply conceptual understanding of the Physics to general real-world situations.

220	A D17D2	Allia J Denstiant	1	1	1	PO 1 To apply the convict design of the second day	DEC 1 To understand the same theories and existing to the Division which	CO 1. To demonstrate the observation of the small conductivity in
230	AP17P3	Ained Practical – General Physics Lab				PO 1 - 10 apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - 10 understand une core theories and principies of rhysics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - 10 demonstrate the phenomena of thermal conductivity in good and bad conductor. (forbs' method, Lee' s discrenethod). CO 2 - To apply the laws of transverse vibration and estimate the frequency of A.C mains using sonometer. CO 3 - To interpret the principle involved in the formation of lissajous figures using oscillators. CO 4 - To understand the concept and characteristics of sound through experiments. CO 5 - To organize and present the performed experiments in graphical format.
231	AP1741	Allied II – Allied Physics - II (for II B.Sc Chemistry)				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To demonstrate the phenomena of thermal conductivity in good and bad conductor. (Forbe's method, Lee's discrenthod). CO 2 - To apply the laws of transverse vibration and estimate the frequency of A.C mains using sonometer. CO 3 - To interpret the principle involved in the formation of Lissajous figures using scillators. CO 4 - To understand the concept and characteristics of sound through experiments. CO 5 - To organize and present the performed experiments in graphical format.
232	PC1751	Major Core V - Element of Modern Physics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To explain the theories and experiment related to particle and wave nature of particles. CO 2 - To identify particle nature experiments (photo electric effect, planks law, compton effect, photoelectric effect) and wave nature experiments, (thomson experiment, division germer experiment). CO 3 - To define uncertainty principle. CO 4 - To analyse various models of atomic spectra. CO 5 - To solve schrodinger equation in different dimensional stages. CO 6 - To estimate lorentz transformation for length contraction, time dilation.
233	PC1752	Major Core VI - Optics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To explain the fundamental principle of optics. CO 2 - To determine the behavior of a ray at any optical surface (lenses, Prisms). CO 3 - To explain the types of waves and its characteristics. CO 4 - To analyze the intensity variation of light due to polarization, interference and diffraction. CO 5 - To distinguish interference, diffraction and polarization. CO 6 - To measure the various optical parameters. (focal length, power, refractive index, radius of curvature, dispersive power) using optical components (prism, lenses, glass plate, grating). CO 8 - To understand the interference and diffraction from wave optics concepts and know its applications.
234	PC1753	Major Core VII - Solid State Physics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To illustrate various types of bonding present in solids withexample. CO 2 - To explain the various crystal parameters and structures. CO 3 - To discuss the various theories involved in magnetic materials. (dia, para, ferro, ferri and antiferro magnetism). CO 4 - To describe polarization processes and analyze the information contained in the temperature and frequency dependence of dielectic materials. CO 5 - To analyze the structure and physical properties of semiconductors. CO 6 - To describe and discuss the theory of superconductivity and superconducting materials.
235	PC1754	Major – Elective - III (a) Programming with C++			D	PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To describe the principles of object oriented program. CO 2 - To apply object oriented programming techniques to solve computing problems. CO 3 - To develop programs using functions and classes. CO 4 - To develop programs using constructor, destructor, operator overloading and inheritance. CO 5 - To formulate the applications of pointers and virtual functions. CO 6 - To distinguish formatted and unformatted I/O operations.
236	PC1755	Major – Elective - III (b) Applied Physics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	$\begin{array}{l} {\rm CO}\ 1 - {\rm To}\ understand the general Physics principles of instruments used in the medical field. \\ {\rm CO}\ 2 - {\rm To}\ explain the use of non ionizing radiation in imaging the body. \\ {\rm CO}\ 3 - {\rm To}\ outline various features and behavioral activity of the sun and heavenly bodies of solar system. \\ {\rm CO}\ 4 - {\rm To}\ discuss the transformation and characteristics of fiber and its manufacturing techniques. \\ {\rm CO}\ 5 - {\rm To}\ interpret the technique involved in camera, television, etc. \\ {\rm CO}\ 6 - {\rm To}\ explain the principles, concepts and operation of satellite communication. \end{array}$
237	PC1756	Major – Elective - III (c) Bio Physics				[PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To explain atomic and molecular structure of biomolecules. CO 2 - To interpret the structure of cells and the major components within a cell. CO 3 - To discuss the importance of diffusion, random walks, entropyand self-assembly in biological systems. CO 4 - To illustrate the models of cellular dynamics. CO 5 - To describe stem cell and brain structure: Explain the core concepts of biological literacy. (evolution,biological structure- function relationships, information flow pathways and transformations of energy and matter).

238	PSK175	Skill Based Course -				PO 1 - To apply the acquired scientific knowledge	PSO 1 - To understand the core theories and principles of Physics which	CO 1 - To recall the basic definitions and units of electrical
238	P3N173	Shin Basic electric circuits Basic electric circuits and Applications	D			PO 1- 10 apply the acquired schedule to the day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	FSO 1 - 10 understand une core incortes and principles of Physics Winch include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To feed the ossic deminions and units of electrical quantities. CO 2 - To analyze the circuit elements and their connections. CO 3 - To understand various power generation methods. CO 4 - To develop their own circuitus using electrical wiring. CO 5 - To compare the Physics concepts behind various electrical instruments and appliances. (Voltmeter, Ammeter, Multimeter, Incandescent lamp, Fluorescent bulb, Choke and Starter, Electric Iron). CO 6 - To demonstrate uses of tester & multimeter, LDR, microphone, Loudspeaker, etc.
239	PC1761	Major Core VIII - Mathematical Methods of Physics	Ø			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To illustrate linear dependence and combination of vectors as quantities in Physics. CO 2 - To evaluate problems in matrices. CO 3 - To solve ordinary and partial differential equations related to physical science. CO 4 - To adapt fourier transform technique to obtain the fourier series of periodic functions of Physics. CO 5 - To understand and manipulate random variables using the theory of probability including tools of probability transformation and characteristic functions.
240	PC1762	Major Core IX - Digital System and Application			V	PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To understand the fundamental concepts and techniques used in digital electronics. CO 2 - To perform conversions among different number systems and apply in digital designing. CO 3 - To infer the basic logic gates, understand boolean algebra and simplify simple boolean functions by using basic boolean properties. CO 4 - To understand, analyse and design various combinational and sequential circuits. (Flip flop, counters, MUX, DEMUX, encoder, decoder etc.) CO 5 - To understand the architecture and operations of microprocessor 8085.
241	PC1763	Major Core X - Nuclear Physics			V	PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To expendent appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To define the fundamentals of nuclear matter. (properties of nuclear indicate forces). CO 2 - To apply the principles of Physics in the measurements of nuclear size, nuclear spin, nuclear energy levels and nuclear magnetic moment. CO 3 - To assess radioactivity and various nnuclear reactions. (nuclear fission and fusion). CO 4 - To explain the decay modes, radiation detectors and particle accelerators. (ionisation chamber, proportional counter, geiger muller counter, linear accelerator, cyclotron, synchro cyclotron, betatron). CO 5 - To discuss the classification of elementary particles and quark model. CO 6 - To analyse the characteristics and behavior of elementary
242	PC1764	Major – Elective - IV (a) Nanomaterials and its applications		R)) 2	PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To infer the history of nanotechnology and explain the various dimensions of nanostructures. CO 2 - To apply the characterization techniques of nanomaterials.(XRD,SEM,TEM and analytical electron microscope). CO 3 - To explain the synthesis of nanomaterials and categorize their properties. CO 4 - To interpret quantum well, quantum wires and quantum dots. CO 5 - To explain the carbon nanotubes and its applications. CO 6 - To discuss the applications of nanotechnology in various fields.
243	PC1765	Major – Elective - IV (b) Basic AstroPhysics		R		PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To identify the historical evolution of sun and planets. CO 2 - To apply the principles of Physics in the measurements of distances, mass, radius, density and luminosity of stars. CO 3 - To compare the resolving power and light gathering power of an astronomical telescope. CO 4 - To explain the physical characteristics of sun and other stars. CO 5 - To analyse the structure of the universe and milky way galaxy. CO 6 - To discuss the observations of galaxies, dark matter, quasars and pulsars. CO 7 - To develop a deeper understanding of some important
244	PC1766	Major – Elective - IV (c) Digital Signal Processing		N		PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To formulate discrete time signals, evaluate their energy and power, check for periodicity and evaluate the period of a signal. CO 2 - To identify properties of discrete time systems. (stability, causality, invertibility). CO 3 - To evaluate discrete-time fourier transform (DTFT) of a sequence. CO 4 - To compute the linear and circular convolution of discrete- time sequences. CO 5 - To estimate the z-transform of a sequence, identify its region of convergence and compute the inverse Z- transform. CO 6 - To evaluate the discrete Fourier transform (DFT) of a sequence, relate it to the DTFT and use the DFT to compute the
245	PC17P5	Major Practical V - Physics Lab V				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To demonstrate the experimental techniques and develop competence in handling optical instruments. CO 2 - To demonstrate an understanding of the scientific method and apply it in practice. CO 3 - To analyse the diffraction and dispersion phenomena in optical elements (grating or prism) using spectrometer. CO 4 - To measure the various optical parameters. CO 5 - To develop practical hands-on experience applying widely used techniques to investigate optical phenomena. CO 6 - To record, analyze, interpret and critically evaluate cauchy's constant and hartmann's interpolation formula experimentally.

246	PC17P6	Major Practical VI - Physics Lab VI			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.	CO 1 - To demonstrate the experimental techniques and develop competence in handling optical instruments. CO 2 - To demonstrate an understanding of the scientific method and apply it in practice. (a familiarity with optics).
					PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 3 - To analyse the diffraction and dispersion phenomena in optical elements (grating or prism) using spectrometer. CO 4 - To measure the various optical parameters (focal length, dispersive power, refractive index, radius of curvature, minimum deviation etc) using optical elements. CO 5 - To develop practical hands-on experience applying widely used techniques to investigate optical phenomena. CO 6 - To record, analyze, interpret and critically evaluate cauchy's constant and hartmann's interpolation formula experimentally.
247	PC17P7	Major Practical VII - Physics Lab VII			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To understand the principles of object oriented program to construct computer programs and modeling of experimental data for the solution of problems in Physics. CO 2 - To develop programs using functions and classes. CO 3 - To formulate the applications of pointers and virtual functions . CO 4 - To distinguish formatted and unformatted I/O operations. CO 5 - To develop programs using constructor, destructor, operator overloading and inheritance. CO 6 - To analyze the concepts trained in the computer lab activities and provide an understanding of data acquisition and analysis.
248	PSK176	SBC -Project			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To explore new areas of research in Physics . CO 2 - To analyze a research problem and construct tools for data collection. CO 3 - To write research reports and present results in the scientific community. CO 4 - To develop skills to serve in science related industries and agencies. CO 5 - To develop skills to publish articles in reputed journals.
249	PC17S1	Self Learning Course - Physics for Competitive Examination - I			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To recall the principles of mechanics and conservation laws; understand the concept of fluid dynamics. CO 2 - To examine the various aberrations and geometry involved in optics. CO 3 - To apply the laws of thermodynamics on heat phenomena.
250	PC17S2	Self Learning Course - Physics for Competitive Examination - II			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop emergeneerural skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To recall the principles of mechanics and conservation laws; understand the concept of fluid dynamics. CO 2 - To examine the various aberrations and geometry involved in optics; apply the laws of thermodynamics on heat phenomena.
251	PP2011	Core I – Classical Mechanics		6	PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Niteroprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the basic mechanical concepts related to single and system of particles. CO 2 - To apply various mechanical principles to find solution for physical problems. CO 3 - To obve the equations of motion using lagrangian, hamiltonian and hamilton– jacobi equations. CO 4 - To explain the origin of coriolis and centrifugal terms in the equation of motion in a rotating frame. CO 5 - To understand and develop a scientific knowledge in central force problems and relativity.
252	PP2012	Core II – Mathematical Physics			PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, ManoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To apply the various theorems in complex analysis to evaluate definite integrals. CO 2 - To determine the series solutions and the recurrence relations (bessel, legendre and hermite differential equations) and solve problems associated with them. CO 3 - To discuss the basic principles and methods used for the analysis of partial differential equations and apply the techniques to related problems. CO 4 - To discuss the concepts of fourier, haplace and inverse laplace transform, tensors, group theory and their properties. CO 5 - To develop expertise in mathematical techniques required in Physics and to enhance problem solving skills.

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253	PP2013	Core III – Quantum Mechanics- I	Ŋ		PO 1 - 10 recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - 10 have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - 10 summarze the concept of wave function and the postulates of quantum mechanics. CO 2 - To formulate time dependent and time independent equation and solve them for simple potentials. CO 3 - To evaluate the eigen values and eigen function spin and total angular momenta and determine the matrices. CO 4 - To analyze the principles of quantum theory, equation of motion, scattering theory and angular momentum.
254	PP2014	Elective I – (a)		☑	PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To understand the basic knowledge on nuclei and neutron to know other factors like properties and contraining
		Physics			Indust a precontens. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	experimental interious of avoinced mysics. (Classical mytechnics, Mathematical Physics, Quantum Mechanics, Sold State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	60 Know Onlier lactors into properties and scattering. CO 2 - To examine the neutron interactions to formulate probability.diffusion, fermi- age equations. CO 3 - To analyse the working of nuclear reactors and its reaction to produce nuclear energy. CO 4 - To study the nuclear fusion reaction and apply its principle for stellar energy.
255	PP2015	Elective I – (b) Molecular Physics			PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, MonePhysics, Microprocessore etc.), PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To understand the chemical bonding of molecules and various theories of homo and hetero nuclear diatomic molecules. CO 2 - To analyze the symmetry operations and molecular orbital theory. CO 3 - To analyze the electronic properties of molecules, newtonian and hamiltonian dynamics and phase space trajectories. CO 4 - To understand the molecular collisions and different energies caused by reactive collisions. CO 5 - To evaluate the transport of electron and the formation of electronic bands and spectra.
256	PP2016	Elective I – (c) Numerical Methods			PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1- To have vell-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Nicorporcessor etc.).PSO 2- To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations.PSO 3- To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, PSO 4- To apply and interpret Physics principles in various physical observations.PSO 4- To denonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7- To understand the impact of Physics in a global, economic,	CO 1 - To apply various interpolation methods and finite difference concepts. CO 2 - To analyze the numerical solutions of linear and non linear equations. CO 3 - To utilize various numerical methods for differentiation and integration. CO 4 - To solve ordinary differential equations whenever and wherever routine methods are not applicable.
257	PP2021	Core IV – Electromagnetic Theory			PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have vell-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Nicorprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To summarize the fundamental laws of electrodynamics based on maxwell's equations . CO 2 - To enumerate the concept of energy in electrostatic and magnetostatic fields. CO 3 - To illustrate the electrical properties of materials. CO 4 - To solve the wave equation as plane waves in source. CO 5 - To analyze the wave polarization and reflection / transmission of plane waves in homogenous media.
258	PP2022	Core V – Quantum Mechanics– II			PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To enumerate time independent perturbation theory and use approximation methods. CO 2 - To analyze time dependent perturbation theory to discuss absorption and emission of radiation for harmonic perturbation. CO 3 - To interpret quantum theory of atomic and molecular structure. CO 4 - To formulate klein – gordan and dirac equations and discuss the applications.
259	PP2023	Core VI – Condensed MatterPhysics– I			PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To differentiate between different lattice types and explain the concepts of reciprocal lattice and crystal diffraction. CO 2 - To analyze various crystal imperfections and ordered phases of crystal. CO 3 - To explain the theory of lattice vibrations and analyze the thermal properties of solids. CO 4 - To formulate the problem of electrons in a periodic potential.

260	PP2024	Elective II (a)			6	RO 1 To recognize the scientific facts behind	PSO 1 To have well defined knowledge on theoretical concents and	CO 1 To understand the principle and working of transducars
200	FF2024	Excerve II = (a) Experimental design				PO 1 - 10 recognize the scientific facts benind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	FSO 1 - 10 nave visual methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, MonoPhysics, Microprocessor etc.).FSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations.FSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics.FSO 4 - To apply and interpret Physics principles in various physical observations.FSO 4 - To ademonstrate proficiency in analyzing, applying and solving scientific problems.FSO 7 - To understand the impact of Physics in a global, economic, anvironmented, and context.	CO 1 - 10 inderstand the principle and working of transduces. CO 2 - To examine the measurement systems and errors in it. CO 3 - To analyse the X ray measurements and to find TEM, SEM,EDS, FESEM, AFM, UV Vis, IR, FTIR characterizations. CO 4 - To get an introduction and idea on optical fibres.
261	PP2025	Elective II – (b) Introductory Astronomy, Astro Physics& Cosmology		6		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To perceive the historical evolution of solar system and universe. CO 2 - To describe the principles of Physics in the formation of astronomical objects like planets, satellites, asteroids and comets. CO 3 - To gain experience with measurement techniques and equipment and develop the ability to assess certainties and assumptions. CO 4 - To interpret the observations of galaxies, dark matter, quasars and pulsars. CO 5 - To achieve a good understanding of physical laws and principles in cosmology.
262	PP2026	Elective II - (c) Laser Physics			b	(PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.).PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To acply and interpret Physics principles in various physical observations.PSO 4 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To develop knowledge in the basics of lasers. CO 2 - To enhance comprehension in the principles of lasers . CO 3 - To analyse the control of laser operties. CO 4 - To familiarize with the diverse applications of lasers.
263	PP20P1	Practical I – Advanced Physics Lab – I (General Physics)	6			PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 6 - To utilize the obtained scientific knowledge to create eco- friendly environment.	PSO 1- To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Niteroprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To demonstrate practical skills to work with complex problems and advanced experimental equipment. CO 2 - To develop a practical knowledge in hall effect and in determination of magneto resistance. CO 3 - To develop practical experience in LASER experiments. CO 4 - To measure and compare the dielectric constant of various liquids. CO 5 - To apply ultrasonic interferometers to determine the velocity of sound.
264	PP20P2	Practical II – Advanced Physics Lab – II (Programming with C++)				PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 6 - To utilize the obtained scientific knowledge to create eco- friendly environment.	PSO 1- To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Niteroprocessor etc.). PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 6 - To demonstrate proficiency in analyzing, applying and solving scientific problems. PSO 7 - To understand the impact of Physics in a global, economic,	CO 1 - To understand the basic concept of Object Oriented Programming (OOP). CO 2 - To interpret the theoretical formulation for physical phenomena and apply experimental numerical. CO 3 - To simulations methods to find the solution. CO 4 - To apply computational methods and numerical algorithms to problems in advanced Physics using C++ programming. CO 5 - To develop a basic knowledge in high level programming languages.
265	PP1731	Core VII - Integrated Electronics Core VIII - Microprocessor and Microcontroller				 PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and research projects to develop scientific skills and problemomena. PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. 	PSO 1- To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Molecular Spectroscopy etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics, experiments and projects using modern technology and numerical simulations. PSO 3 - To acquire skills in performing advanced Physics, PSO 3 - To acquire skills in performing interpret Physics, PSO 4 - To apply and interpret Physics principles in various physical observations.	 CO 1 - To understand the basic operation, features and parameters related to diodes, transistor, switching devices and interpret their applications. (FET, JFET, D-MOSFET, EMOSFET, SCR, DIAC, TRIAC). CO 2 - To explain about the internal circuitry and logic behind any digital system (AND, OR, NOT, NAND, NOR, RTI, TTL, J2L). CO 3 - To assess the working of combinational circuits.(flip flops, counters). CO 4 - To design various synchronous and asynchronous sequential circuits. CO 5 - To understand the characteristics of op-amps and the applications of op-amps. CO 1 - To identify / explain the operation of various components of the microprocessor 8085. CO 2 - To relate and explain the various addressing modes and the instruction set of 8085 microprocessor. CO 3 - To understand the various interrupts of 8085 microprocessor. CO 4 - To understand the various interrupts of 8085 microprocessor. CO 5 - co syntemment with the common applications of microprocessor.
						POFEL PO 5 - To carry out internship programme and research projects to develop scientific skills and	FSO 4 - 10 apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving	CO 6 - To explain the architecture of 8051 microcontro

267	PP1733 PP1734	Elective III – (a) Physics of the Cosmos Elective III – (b) Radiation Physics				PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and innovative ideas. PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 5 - To demonstrate proficiency in analyzing, applying and solving scientific problems.PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics. (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, NanoPhysics, Microprocessor etc.)	CO 1 - To perceive the historical evolution of solar system and universe. CO 2 - To describe the principles of Physics in the formation of astronomical objects like planets-satellites – asteroids and comets. CO 3 - To examine the requirements and limitations of instrumentation for modern astrophysical observations(optical telescopes and radio telescopes). CO 4 - To explain the basic issues involved in present day astrophysical investigations(red shift and the expansion of the universe). CO 5 - To analyse the formation of binary stars, multiple stars, neutron stars and black holes. CO 6 - To interpret the observations of galaxies, dark matter, CO 1 - To understand the various radiation sources and its interaction with matter. CO 2 - To understand the Design features of the radiation detectors and the accelerators. CO 3 - To acquire skills and apply it in diagnostic technology .
						industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and	PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving	CO 4 - 10 interpret the radiation dosimeter principles. CO 5 - To apply the various radiations in industrial field for scientific development. CO 6 - To identify and apply the radiation for therapy and for diagnosis purposes.
269	PP17P4	Research Project	Ø			PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.	CO 1 - To explore new areas of research in Physics . CO 2 - To analyze a research problem and construct tools for data collection. CO 3 - To write research reports and present results in the scientific community. CO 4 - To develop skills to serve in science related industries and agencies. CO 5 - To develop skills to publish articles in reputed journals.
270	PP17S1	Self Learning Course - Physics for Lectureship Examination – I				PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 5 - To demonstrate proficiency in analyzing, applying and solving	CO 1 - To familiarize with a range of mathematical methods that are essential for solving advanced problems in theoretical Physics. CO 2 - To model mechanical systems, both in inertial and rotating frames, using Lagrange and Hamilton equations. CO 3 - To gain insight into the physical nature of electric and magnetic phenomena. CO 4 - To use quantum mechanical principles to analyze advanced physical phenomena of nature. CO 5 - To understand the theory and methods of statistical Physics and thermodynamics.
271	PP1741	Core IX – Material Science				PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.), PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 2 - To demonstrate proficiency in analyzing, applying and solving	CO 1 - To understand phase diagrams and relate to the design and control of heat treating procedures. CO 2 - To analyze the elastic behavior of materials. CO 3 - To recognize the nature of dislocations in materials and the role they play in the deformation processes. CO 4 - To review the mechanisms involved in oxidation and corrosion of materials. CO 5 - To compare the different types of composites to design materials having property combinations that are better than those found in the metal alloys, ceramics and polymeric materials.
272	PP1742	Core X - Nuclear and Particle Physics				PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.)PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 5 - To demonstrate proficiency in analyzing, applying and solving	CO 1 - To understand the properties of Nuclear forces and outline their behavioral formulation. CO 2 - To interpret the behavior and properties of the deuteron in the ground and excited state. CO 3 - To analyze the different nuclear models of the nucleus and examine the application of the shell model of nucleus. CO 4 - To explain the characteristics and effect of radioactive decay phenomena. CO 5 - To discuss the outcome of various types of nuclear reactions. CO 6 - To analyse the working of nuclear reactors. CO 6 - To analyse the working of nuclear reactors.
273	PP1743	Core X1 - Molecular Spectroscopy Physics for Lectureship Examination – 1		Ø		PrO 1 - 10 recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurical pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFFL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFFL. PO 5 - To carry out internship programme and research projects to develop scientific skills and	PSO 1 - 10 nave welt-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and project using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics, Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics, PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics, PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving	CU 1 - 10 apply basic spectroscopic techniques (Microwave, IR, Raman and NMR). CO 2 - To infer basic spectroscopic techniques (Microwave, IR, Raman, ESR, NQR and NMR). CO 3 - To understand the molecular interactions in different spectroscopic methods. CO 4 - To analyze the characteristics of rotational spectra and vibrational energy of diatomic molecules. CO 4 - To analyze the characteristics of rotational spectra and vibrational energy of diatomic molecules. CO 4 - To analyze the characteristics of rotational spectra and vibrational energy of diatomic molecules. CO 4 - To analyze the characterize (Microwave, IR, Raman and NMR) for characterization of molecules. CO 6 - To utilize various spectroscopic methods suitable for characterizing a molecule. CO 1 - To familiarize with a range of mathematical methods that are essential for solving advanced problems in theoretical Physics. CO 2 - To model mechanical systems, both in inertial and rotating frames, using Lagrange and Hamilton equations. CO 3 - To understand the physical nature of electric and magnetic phenomena. CO 4 - To use quantum mechanical principles to analyze advanced Physical phenomena of nature. CO 5 - To understand the theory and methods of statistical Physics and thermodynamics.

275	PP1744	Elective IV – (a) Nano		ſ		PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concents and	CO 1 - To identify how basic Physics can be used to describe the
215	111/44	Physics		6	5	natural phenomena.	experimental methods of advanced Physics (Classical Mechanics,	behaviour of electrons in nano-scale materials.
						PO 2 - To relate the theory and practical knowledge	Mathematical Physics, Quantum Mechanics, Solid State Physics,	CO 2 - To explain the variation in the density of states in
						to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	nanostructures for different dimensions.
						industry, government, academia, research.	NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments	Nanotechnology in various fields.
						entrepreneurial pursuits and consulting firms.	and projects using modern technology and numerical simulations.	CO 4 - To explain Laser effect in Quantum well, Quantum wires
						PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	& quantum dots.
						competitive examinations like NET, GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	CO 5 - To compare the structure and properties of Carbon
						PO 5 - To carry out internship programme and	observations.	CO 6 - To discuss the applications of Quantum Hetro structures
						research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	and super lattices.
						innovative ideas.	scientific problems.	CO 7 - To develop key concepts in Single electron transistor,
276	PP1745	Elective IV – (b)			R	PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To explain the need for a classical theoretical approach to
		Quantum Field Theory				natural phenomena.	experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Machanics, Solid State Physics	quantum theory.
						to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	theories characteristics by patterns of symmetric breaking.
						PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	CO 3 - To examine the significance of Neopher's theorem.
						industry, government, academia, research,	PSO 2 - To acquire skills in performing advanced Physics experiments	CO 4 - To solve problems based on Feynman diagrams.
						PO 4 - To face and succeed in high level	and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from	CO 5 - 10 solve problems based on Feynman diagrams.
						competitive examinations like NET, GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	CO 7 - To design calculation techniques for quantum
						TOFEL.	PSO 4 - To apply and interpret Physics principles in various physical	electrodynamics.
						PO 5 - To carry out internship programme and	observations.	CO 8 - To survey the quantization around non perturbative
077	001702	D C III		_	-	PO 1 T	PSO 5 = 10 demonstrate proficiency in analyzing, apprying and solving	CO 1 T 1 1 1 1 1 C 1 C 1 C C C C C
2//	PP1/P3	Advanced Physics Lab			⊵	PO 1 - To recognize the scientific facts benind natural phenomena.	experimental methods of advanced Physics (Classical Mechanics.	excess 3).
		- III (Electronics)				PO 2 - To relate the theory and practical knowledge	Mathematical Physics, Quantum Mechanics, Solid State Physics,	CO 2 - To design various synchronous and asynchronous
						to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	sequential circuits and study their working.
						PO 3 - To prepare successful professionals in industry, government, academia, recearch	NanoPhysics, Microprocessor etc.)	CO 3 - To analyse the applications of op- amps (sine, triangular
						entrepreneurial pursuits and consulting firms.	and projects using modern technology and numerical simulations.	CO 4 - To analyse the behavior of counters (up/down, mod, ring).
						PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	CO 5 - To analyse the working of electronic circuits (multiplexer,
						competitive examinations like NET, GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	demultiplexer, adder, subtractor).
						PO 5 - To carry out internship programme and	observations.	
						research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	
278	PP17P4	Practical IV -		t	⊵	PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To experiment with assembly language programming on
		Advanced Physics Lab				natural phenomena.	experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Machanics, Solid State Physics	8085 microprocessor (Addition, Subtraction, Multiplication
		and Micro Controller)				to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	CO 2 - To apply assembly language programming on
						PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	microprocessor (Data Manipulation, square of numbers, counters).
						industry, government, academia, research, entrepreneurial pursuits and consulting firms	PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations	CO 3 - To Analyse the interfacing of microprocessor 8085 with I/O devices (A/D& D/A. Stepper motor)
						PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	CO 4 - To apply assembly language programs for 8051
						competitive examinations like NET, GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	microcontroller.
						TOFEL. BO 5 To carry out internship programma and	PSO 4 - To apply and interpret Physics principles in various physical	
						research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	
279	PP17S2	Self Learning Course -	ſ	7		PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To understand the physical construction, working and
		Physics for Lectureship				natural phenomena.	experimental methods of advanced Physics (Classical Mechanics,	operational characteristics of semiconductor devices.
		Examination – II				PO 2 - To relate the theory and practical knowledge to solve the problems of the society	Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics	CO 2 - To attain knowledge on the structure and dynamics of the molecules through various theories
						PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	CO 3 - To develop analytical thinking to understand the
						industry, government, academia, research,	PSO 2 - To acquire skills in performing advanced Physics experiments	phenomenon that decide various properties of solids.
						PO 4 - To face and succeed in high level	and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from	CO 4 - To know the scientific, environmental and technological applications of nuclear Physics
						competitive examinations like NET, GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	CO 5 - To study the fundamentals of wave mechanics.
						TOFEL.	PSO 4 - To apply and interpret Physics principles in various physical	
						PO 5 - To carry out internship programme and research projects to develop scientific skills and	observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving	
280	MPP191	C1 Profesional		_		PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concents and	CO 1 - To acquire practical skills (in subject) aiming at gaining
200	MIT 191	Skillsfor Teaching -			Ľ	natural phenomena.	experimental methods of advanced Physics (Classical Mechanics,	confidence to handle practical classes.
		Learning				PO 2 - To relate the theory and practical knowledge	Mathematical Physics, Quantum Mechanics, Solid State Physics,	CO 2 - To develop teaching skills and gain confidence in teaching.
						to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.)	
						industry, government, academia, research,	PSO 2 - To acquire skills in performing advanced Physics experiments	
						entrepreneurial pursuits and consulting firms.	and projects using modern technology and numerical simulations.	
						PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	
						TOFEL.	PSO 4 - To apply and interpret Physics principles in various physical	
						PO 5 - To carry out internship programme and	observations.	
						research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	
281	MPP182	C2:ResearchMethodolo				PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To assess the fundamentals of thin film preparation and
		БУ				PO 2 - To relate the theory and practical knowledge	Mathematical Physics, Quantum Mechanics, Solid State Physics.	and mechanical properties.
						to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	CO 2 - To understand the basic concepts of research and its
					1	PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	methodologies of scholarly writing and evaluate its quality.
						industry, government, academia, research, entrepreneurial pursuits and consulting firms	PSO 2 - 10 acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations	of mathematical Physics.
						PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	CO 4 - To demonstrate an understanding of the basic features and
						competitive examinations like NET, GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	concepts of the Sun and other stars.
						PO 5 - To carry out internship programme and	observations.	applications of photonic cystals.
						research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	11
282	MPP183	C3:Advanced Physics		\dagger		PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To interpret the band structure of metals, semiconductors
						natural phenomena.	experimental methods of advanced Physics (Classical Mechanics,	and insulators.
						to solve the problems of the society	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	2 - 10 analyze the structure, preparation methods and applications of high temperature cuprate superconductors
						PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	CO 3 - To describe the various crystal growth techniques and
						industry, government, academia, research,	PSO 2 - To acquire skills in performing advanced Physics experiments	determine the growth parameters of crystals.
						PO 4 - To face and succeed in high level	and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from	characteristics.
						competitive examinations like NET, GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	
						TOFEL.	PSO 4 - To apply and interpret Physics principles in various physical	
1						research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	

			r r		N		
283	MPP184	C3:Principles and Methods of Crystal Growth			[PO 1 - 10 recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To reground the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1. To bey sudd defined knowledge on theoretical concents and	CO 1 - To categorize the various crystal growth methods. CO 2 - To understand the various theories of nucleation process involved in crystal growth. CO 3 - To discuss the theories of crystal growth and familiarize in choosing an apt method for growing materials. CO 4 - To Discuss the methods of melt growth technique for both conventional and non-conventional growth processes. CO 5 - To compile the various crystal growth techniques.
204	MIT 10J	Concessator Frends in Nano science and Technology			FO 1- to recognze the scientific tacks behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and	130 1 * 10 have working of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving	CO 1 = 10 inclue toxics properties on nanoparticles (size, shape, density melting, boiling point). CO 2 - To explain the technique involved in measuring different properties of nanoparticles. CO 3 - To explain the characteristics and behaviour of nanoparticles in dispersed system. CO 4 - To explain the characteristics and behaviour of system. CO 5 - To utilise different characteristics networks to estimate physical properties of nanoparticles.
285	MPP186	C3: Electronic Structure Calculations for Solids			PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms, PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL PO 5 - To carry out internship programme and research projects to develop scientific skills and innovative ideas.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To identify the eigen values and eigen functions of materials using theoretical calculations. CO 2 - To discuss the probability of occupancy of an electron in an energy state at various pressures by electronic structure calculation. CO 3 - To analyse the crystal parameters to investigate electronic and structural phase transition in crystalline materials. CO 4 - To apply the FP-LMTO method in the Basic theories of electronic structure. CO 5 - To explain the phenomenon of Metallization, superconductivity and Fermi surface in materials. CO 6 - To compare the various band structure methods suitable for metals, semiconductors and insulators using recent reprints (KLRbI, CJ, CBr and alkali haides). CO 7 - To develop a deeper research experience in electronic
286	MPP19D	Dissertation and Viva Voce			PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physical observations.	CO 1 - To explore new areas of research in Physics. CO 2 - To analyze a research problem and construct tools for data collection. CO 3 - To write research reports and present results in the scientific community. CO 4 - To develop skills to serve in science related industries and agencies. CO 5 - To develop skills to publish articles in reputed journals.
					research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	
				_	research projects to develop scientific skills and	2019-2020	
287	PC1711	Major Core I -		20	research projects to develop scientific skills and PO 1 - To apply the acquired scientific knowledge	PSU 5 - 10 demonstrate proficiency in analyzing, applying and solving 2019-2020 PSO 1 - To understand the core theories and principles of Physics which	CO 1 - To undersand the fundamentals of dynamics .
287	PC1711	Major Core I - Mechanics and Properties of Matter			PO 1 - To apply the acquired scientific skills and PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 5 - 10 demonstrate proticiency in analyzing, applying and solving 2019-2020 PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To undersand the fundamentals of dynamics . CO 2 - To explain the conservation laws. CO 3 - To apply the concept of moment of inertia to objects of different shapes . CO 4 - To distinguish elastic and inelastic collisions and discuss the centre of pressure and Bernoulli's theorem. CO 5 - To explain the different moduli of elasticity. CO 6 - To analyze the various properties of liquids through theory and experiments.
287	PC1711	Major Core I - Mechanics and Properties of Matter Allied I – Allied Physics – I (for I B.Sc Maths)			PO 1 - To apply the acquired scientific skills and PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	 PSO 5 - 10 demonstrate proficiency in analyzing, applying and solving D1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 1 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 1 - To avelop extensive comprehension of fundamental and diverse applications of Physics. PSO 2 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply howedge of principles, concepts in Physics and analyze their local, antional and global impact. PSO 4 - To apply hysics. PSO 4 - To apply hysics. PSO 4 - To apply hysics. PSO 4 - To apply here entrical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To apply here entrical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To apply here entrical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To apply here entrical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entreprenerular skills, empowered according to the professional requirement and become self-d	 CO 1 - To undersand the fundamentals of dynamics . CO 2 - To explain the conservation laws. CO 3 - To apply the concept of moment of inertia to objects of different shapes . CO 4 - To distinguish elastic and inelastic collisions and discuss the centre of pressure and Bernoulli's theorem. CO 5 - To explain the different moduli of elasticity. CO 6 - To analyze the various properties of liquids through theory and experiments. CO 1 - To interpret simple systems undergoing simple harmonic motion and derive equations of motion. CO 2 - To demonstrate the bending moment Diagrams. CO 4 - To distinguish between the characteristics and features of various phenomena of light. CO 5 - To analyze and study the applications of dispersion and refraction through a prism.
287 288 288	PC1711 AP1711 PNM171	Major Core I - Mechanics and Properties of Matter Allied I - Allied Physics - I (for I B.Sc Maths) NMEC - Everyday Physics I			 PO 1 - To apply the acquired scientific skills and PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To arry out field works and projects independently and in collaboration with other institution. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. 	 PSO 5 - 10 demonstrate proficiency in analyzing, applying and solving 2019-2020 PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 1 - To inderstand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 1 - To advelop entrepreneurial skills, empowered according to the professional requirement and become self-dependent. PSO 4 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply horvical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent. PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 1 - To understand the core theories and principles of Physics and analyze their local, national and global impact. PSO 1 - To understand the core theories and principles of Physics and analyze their local, national and global impa	 CO 1 - To undersand the fundamentals of dynamics . CO 2 - To explain the conservation laws. CO 3 - To apply the concept of moment of inertia to objects of different shapes . CO 4 - To distinguish elastic and inelastic collisions and discuss the centre of pressure and Bernoulli's theorem. CO 5 - To explain the different moduli of elasticity. CO 6 - To analyze the various properties of liquids through theory and experiments. CO 1 - To interpret simple systems undergoing simple harmonic motion and derive equations of motion. CO 2 - To demonstrate the bending moment Diagrams. CO 3 - To explain the different south of elasticity and experiments. CO 4 - To distinguish between the characteristics and features of various phenomena of light. CO 5 - To analyze and study the applications of dispersion and refraction through a prism. CO 1 - To understand their knowledge of basic scientific principles and fundamental concepts in Physics. CO 3 - To explain safety measure for using electricity. CO 3 - To explain add evices(thermometer, refrigerator). CO 4 - To oidentify basic Physics principles of instruments (vena, violinguitar, drum, flute) and devices(thermometer, refrigerator). CO 5 - To eahorate the ropecties and application of light properties like refraction, reflection and diffraction. CO 5 - To inderstand their knowledge of basic scientific principles like refraction, reflection and diffraction of light properties like refraction applies in Physics.

291	AP1721	Allied I – Allied	J	1	PO 1 - To apply the acquired scientific knowledge	PSO 1 - To understand the core theories and principles of Physics which	CO 1 - To discuss the conduction convection and
291	AF1/21	Anteel 1 – Alleed Maths) II (for I B.Sc Maths)	2	J	FO 1- TO appy ue acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	13-05 1-70 understand une core uncortes and principles of rhysics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - 10 unccutss the conduction, convection and radiatiophenomenon in heat transfer processes. CO 2 - To determine the significance of steady current and alternating current. CO 3 - To explain the fundamental concepts of electromagnetism and apply it to determine the mutual inductance. CO 4 - To understand the basic ideas in diodes and transistors. CO 5 - To discuss the basic digital operations. CO 6 - To apply Kirchoff's laws to simple electrical circuits.
292	PNM172	NMEC – Every Day Physics II			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	 CO 1 - To understand the principle and working of simple devices in Physics. CO 2 - To elaborate various energy sources (hydro, wind, biomass, geothermal). CO 3 - To explain the physical principles used in instruments. CO 4 - To distinguish different heavenly bodies (star, planet, comets.galaxies). CO 5 - To recall various concepts in Physics.
293	PC17P1	Major Practical I - Physics Lab I			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To apply the theory of elasticity in determining the Young's Modulus of the given material by bending experiments. CO 2 - To revise the perpendicular axes theorem using biflar pendulum. CO 3 - To illustrate the principle of fluid dynamics by demonstration of experiments (Poiscuille's method and Stoke's method). CO 4 - To evaluate the rigidity modulus of torsion pendulum through a simple experiment. CO 5 - To design a record of an experiment in written form with required figures .
294	PC17P2	Major Practical II - Physics Lab II			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To demonstrate the phenomena of thermal conductivity in good and bad conductor. CO 2 - To apply the laws of transverse vibration and estimate the frequency of A.C mains using sonometer. CO 3 - To interpret the principle involved in the formation of Lissajous figures using Oscillators. CO 4 - To understand the concept and characteristics of sound through experiments. CO 5 - To organize and present the performed experiments in graphical format.
295	AP17P1	Allied Practical – General Physics Lab			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To understand the basic principles of Physics through experiments. CO 2 - To measure and determine the various physical parameters. CO 3 - To develop an idea about the handling of variousinstruments. CO 4 - To get an idea about basic Scientific knowledge and implications of its broad working principle. CO 5 - To analysing, interpreting and evaluating data. CO 6 - To build a foundation in Scientific Career.
296	PC1731	Major Core III – Electricity and Magnetism		1	PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - 10 understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CU 1 - To explain the concept and features of the electrostatic force (Coulomb force), magnetic field, flux, force, the electric force field, Gauss's Law and its application (charged sphere, cylinder, plane sheet). CO 2 - To analyse the presence of electric potential and potential difference, within a framework of distributed symmetric charge distributions. CO 3 - To understand the laws of electromagnetic induction as applied to self and mutual induction. CO 4 - To analyse AC circuit behavior. CO 5 - To apply kirchoff's laws and network theorems to electrical circuits.
297	PC1732	Major – Elective - I (a) Non – Conventional Energy Sources			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurula skills, empowered according to the professional requirement and become self-dependent.	 CO 1 - To understand the utilization of solar energy for generating the power. CO 2 - To apply the solar energy in various sectors. CO 3 - To explain the basic principles of wind energy conversion, its components and its classification. CO 4 - To explain the various Biomass conversion Processes. CO 4 - To explain the various Biomass conversion Processes. CO 5 - To discuss the geothermal energy resources and chemical energy resources. CO 6 - To outline the extraction of useful energy from Earth, Ocean, Wind and Sun. CO 7 - To design the various pollution-free energy resources. CO 8 - To solve the present and future energy crisis.
298	PC1733	Major – Elective - I (b Medical Physics			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To understand the Anatomical terms of the body. CO 2 - To explain the physical dynamics of the body. CO 3 - To analyse the heat and pressure system of the body. CO 4 - To discuss the optical, electrical and acoustical behavior of the human body. CO 5 - To gain knowledge and application ideas regarding radiations and diagnostic systems. CO 6 - To identify the radiation units and will be able to measure the radiation dose.

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299	PC1734	Major – Elective - I (c) Physics of Earth			[PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To understand the scientific ideas of how the universe formed and how it is expanding. CO 2 - To discuss the general characteristics and origin of Universe. CO 3 - To explain the physical dimensions and the internal structure of the earth . CO 4 - To discuss the various regions in earth (Hydrosphere, Atmosphere, Cryosphere and Bio-sphere). CO 5 - To explain the dynamical processes that happen in earth. CO 6 - To analyse the earth's temperature change processes at locat to global scales. CO 7 - To discuss the evolution of life on earth and its role in
300	PC17P3	Major Practical III - Physics Lab III			PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply how relicate assoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To understand the scientific method and an ability to apply the scientific method in practice. CO 2 - To understand the theory of Ballistic galvanometer by doing experiments. CO 3 - To recall the basic experiments. CO 4 - To improve the basic skills and attitude which help them to apply these skills in their field of Physics. CO 5 - To understand the practical knowledge of various bridges (Desauty's and Owen's bridge) by demonstration of experiments. CO 6 - To determine the resonant frequency and Q value of a series and parallel LCR circuit and be able to verify the Thevinins and Nortons theorem. CO 7 - To compile a record of an experiment in a clear and logical writen form (e.g., lab manual report, Record) augmented with
301	AP1731	Allied II – Allied Physics - I (for II B.Sc Chemistry)		0	PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To interpret simple systems undergoing simple harmonic motion and derive equations of motion. CO 2 - To demonstrate the bending moment diagrams (Distinguish different type of bending). CO 3 - To explain the properties and behavior of fluids undervarious conditions. CO 4 - To distinguish between the characteristics and features of various phenomena of light. CO 5 - To analyze and study the applications of dispersion and refraction through a prism.
302	PC1741	Major Core IV – Analog System and Application	R		PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop emergeneerula skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To understand the basics of semiconductor Physics for intrinsic and extrinsic materials. CO 2 - To examine the operation, features and parameters related to diodes, transistor, and interpret their applications. CO 3 - To justify the function of semiconductor diodes in filter and bridge circuits. CO 4 - To design amplifier circuits with and without feedback. CO 5 - To analyse the different types of oscillators based on their circuit design LC, RC, RC phase shift, Wien bridge, crystal. CO 6 - To analyse the characteristics and various applications of the op-amp.
303	PC1742	Major – Elective - II (a) Fibre Optics			PO 1- To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To explain the various methods of propagation of light waves through various types of fibres. CO 2 - To explain the structure and performance of LEDS and LASERs. CO 3 - To classify the optical sources and detectors and to discuss their principle . CO 4 - To discuss the channel impairments such as losses and dispersion; Analyse various coupling losses . CO 5 - To understand and compare operation, principles, characteristics, design architecture of modulators and detectors of light.
304	PC1743	Major – Elective - II (b) Microprocessor			PO 1- To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply how relical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To explain the architecture of 8085 microprocessor. CO 2 - To analyze the instruction set of 8085 microprocessor. CO 3 - To develop skill in writing simple programs for 8085 microprocessor. CO 4 - To examine the programming techniques with additional instructions. CO 5 - To analyze the 8085 microprocessor applications. (counters and generation of waves forms).
305	PC1744	Major – Elective - II (c) Communication System		2 2	PO 1- To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2- To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3- To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4- To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7- To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To understand the basic ideas regarding modulation in communication system . CO 2 - To understand the frequency and pulse modulation and explain its detection. CO 3 - To identify and apply appropriate techniques, resources and to solve problems in mobile communication system. CO 4 - To develop the ideas in Satellite Communication. CO 5 - To apply the technical skills and modern tools in electronic communication systems .
306	PC17P4	Major Practical IV - Physics Lab IV			PO 1- To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1- To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneural akills, empowered according to the professional requirement and become self-dependent.	CO 1 - To develop the basic experiments. CO 2 - To improve basic skills and attitude which help them to apply these skills in their field of Physics. CO 3 - To understand the principle and working of analog electronic circuits (zener diode, bridge rectifier) through some basic experiments. CO 4 - To analyze the physical principle involved in the various instruments and design simple circuits for amplifiers (single stage CE amplifier with and without feedback). CO 5 - To Construct simple circuits containing operational amplifiers to as adder and subtractor, differentiator and integrator. CO 6 - To apply conceptual understanding of the Physics to general real-world situations.

207	101702	AU: 10 C 1	1	1	1			
307	AP17P3	Allied Practical – General Physics Lab				PO 1 - 10 apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - 10 understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To demonstrate the phenomena of thermal conductivity in good and bad conductor. CO 2 - To apply the laws of transverse vibration and estimate the frequency of A.C mains using sonometer. CO 3 - To interpret the principle involved in the formation of Lissajous figures using scillators. CO 4 - To understand the concept and characteristics of sound through experiments. CO 5 - To organize and present the performed experiments in graphical format.
308	AP1741	Allied II – Allied Physics - II (for II B.Sc Chemistry)				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the ortifical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To demonstrate the phenomena of thermal conductivity in good and bad conductor. CO 2 - To apply the laws of transverse vibration and estimate the frequency of A.C mains using someter. CO 3 - To interpret the principle involved in the formation of Lissajous figures using scillators. CO 4 - To understand the concept and characteristics of sound through experiments. CO 5 - To organize and present the performed experiments in graphical format.
309	PC1751	Major Core V - Element of Modern Physics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entropremential skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To explain the theories and experiment related to particle and wave nature of particles. CO 2 - To identify particle nature experiments and wave nature experiments. CO 3 - To define uncertainty principle. CO 4 - To analyse various models of atomic spectra. CO 5 - To solve Schrodinger equation in different dimensional stages. CO 6 - To estimate Lorentz transformation for length contraction, time dilation.
310	PC1752	Major Core VI - Optics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To explain the fundamental principle of optics. CO 2 - To determine the behavior of a ray at any optical surface. CO 3 - To explain the types of waves and its characteristics. CO 4 - To analyze the intensity variation of light due to polarization.interference and diffraction. CO 5 - To distinguish Interference, diffraction and polarization. CO 6 - To test the optical planeness of any optical surface. CO 7 - To measure the various optical parameters. CO 8 - To understand the interference and diffraction from wave opticsconcepts and know its applications. CO 9 - To understand polarization of light and its applications
311	PC1753	Major Core VII - Solid State Physics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To illustrate various types of bonding present in solids withexample. CO 2 - To explain the various crystal parameters and structures. CO 3 - To discuss the various theories involved in magnetic materials. CO 4 - To describe polarization processes and analyze the information contained in the temperature and frequency dependence of dielectric materials. CO 5 - To analyze the structure and physical properties of semiconductors. CO 6 - To describe and discuss the theory of superconductivity and superconducting materials.
312	PC1754	Major – Elective - III (a) Programming with C++			S	PO 1- To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	 CO 1 - To describe the principles of object oriented program. CO 2 - To apply object oriented programming techniques to solve computing problems. CO 3 - To develop programs using functions and classes. CO 4 - To develop programs using constructor, destructor, operator overloading and inheritance. CO 5 - To formulate the applications of pointers and virtual functions. CO 6 - To distinguish formatted and unformatted I/O operations.
313	PC1755	Major – Elective - III (b) Applied Physics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	$ \begin{array}{l} {\rm CO}\ 1 - {\rm To\ understand\ the\ general\ Physics\ principles\ of}\\ {\rm instruments\ used\ in\ the\ medical\ field.}\\ {\rm CO}\ 2 - {\rm To\ explain\ the\ use\ of\ non\ ionizing\ radiation\ in\ imaging\ the}\\ {\rm body.}\\ {\rm CO}\ 3 - {\rm To\ outline\ various\ features\ and\ behavioral\ activity\ of\ the}\\ {\rm Sun\ and\ heavenly\ bodies\ of\ solar\ system.}\\ {\rm CO}\ 3 - {\rm To\ outline\ various\ features\ and\ behavioral\ activity\ of\ the}\\ {\rm Sun\ and\ heavenly\ bodies\ of\ solar\ system.}\\ {\rm CO}\ 4 - {\rm To\ discuss\ the\ transformation\ and\ characteristics\ of\ fiber\ and\ that\ tha$
314	PC1756	Major – Elective - III (c) Bio Physics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To explain atomic and molecular structure of biomolecules. CO 2 - To interpret the structure of cells and the major components within a cell. CO 3 - To discuss the importance of diffusion, random walks, entropyand self-assembly in biological systems. CO 4 - To illustrate the models of cellular dynamics. CO 5 - To describe stem cell and brain structure; Explain the core concepts of biological literacy.

315	PSK175	Skill Based Course -			រាជ	PO 1 - To apply the acquired scientific knowledge	PSO 1 - To understand the core theories and principles of Physics which	CO(1 - To recall the basic definitions and units of electrical
313	P3K173	SAIL Base Course		0		PO 1 - 10 apply the acquired scientific kilowiedge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 = 10 understand une core incortes and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To creat the basic demintions and thirds of electrical quantities. CO 2 - To analyze the circuit elements and their connections . CO 3 - To understand various power generation methods. CO 4 - To develop their own circuits using electrical wiring. CO 5 - To compare the Physics concepts behind various electrical instruments and appliances. CO 6 - To demonstrate uses of tester & multimeter, LDR, microphone, loudspeaker, etc. CO 7 - To test for the working of electrical circuits and appliances. music bell, electric fan, lamp controlled by switch, etc.
316	PC1/61	Major Core VIII - Mathematical Methods of Physics	V			 IPO 1 - 10 apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. 	PSO 1-10 understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2- To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - 10 illustrate linear dependence and combination of vectors as quantities in Physics. CO 2 - To evaluate problems in matrices . CO 3 - To solve ordinary and partial differential equations related to Physical Science. CO 4 - To adapt Fourier transform technique to obtain the Fourier series of periodic functions of Physics. CO 5 - To understand and manipulate random variables using the theory of probability including tools of probability transformation and characteristic functions.
317	PC1762	Major Core IX - Digital System and Application			 V	PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and hecome self-demendent.	CO 1 - To understand the fundamental concepts andtechniques used in Digital Electronics. CO 2 - To perform conversions among different number systems and apply in digital designing. CO 3 - To infer the basic logic gates, understand Boolean algebra and simplify simple Boolean functions by using basic Boolean properties. CO 4 - To understand, analyse and design variouscombinational and sequential circuits. CO 5 - To understand the architecture and operations ofmicroprocessor 8085.
318	PC1763	Major Core X - Nuclear Physics				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To define the fundamentals of nuclear matter. CO 2 - To apply the principles of Physics in the easurements of Nuclear size, Nuclear spin, Nuclear energy levels and Nuclear magneticmoment. CO 3 - To assess radioactivity and various nnuclear reactions. CO 4 - To explain the decay modes, Radiation Detectors and Particle Accelerators. CO 5 - To discuss the classification of elementary particles and Quark model. CO 6 - To analyse the characteristics and behavior of elementary particles and their fundamental interactions. CO 7 - To develop a deeper understanding of some important
319	PC1764	Major – Elective - IV (a) Nanomaterials and its applications				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To infer the history of nanotechnology and explain the various dimensions of nanostructures. CO 2 - To apply the characterization techniques of nanomaterials. CO 3 - To explain the synthesis of nanomaterials and categorize their properties. CO 4 - To interpret quantum well, quantum wires and quantum dots. CO 5 - To explain the carbon nanotubes and its applications. CO 6 - To discuss the applications of nanotechnology in various fields.
320	PC1765	Major – Elective - IV (b) Basic AstroPhysics				 PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. 	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To oronumnicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneutial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To identify the historical evolution of sun and planets. CO 2 - To apply the principles of Physics in the measurements of distances, mass, radius, density and luminosity of stars. CO 3 - To compare the resolving power and light gathering power of an astronomical telescope. CO 4 - To explain the physical characteristics of sun and other stars. CO 5 - To analyse the structure of the universe and milky way galaxy. CO 6 - To discuss the observations of galaxies, dark matter, quasars and pulsars. CO 7 - To develop a deeper understanding of some important
321	PC1766	Major – Elective - IV (c) Digital Signal Processing				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the oritical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To formulate discrete time signals, evaluate their energy and power, check for periodicity and evaluate the period of a signal. CO 2 - To identify properties of discrete time systems. CO 3 - To evaluate discrete-time Fourier transform of a sequence. CO 4 - To compute the linear and circular convolution of discrete- time sequences. CO 5 - To estimate the z-transform of a sequence, identify its region of convergence and compute the inverse Z- transform. CO 6 - To evaluate the discrete Fourier transform (DFT) of a sequence, relate it to the DTFT and use the DFT to compute the linear convolution of two equences.
322	PC17P5	Major Practical V - Physics Lab V				PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To demonstrate the experimental techniques and develop competence in handling optical instruments. CO 2 - To demonstrate an understanding of the scientific method and apply it in practice. CO 3 - To analyse the diffraction and dispersion phenomena in optical elements using spectrometer. CO 4 - To measure the various optical parameters using optical elements. CO 5 - To develop practical hands-on experience applying widely used techniques to investigate optical phenomena. CO 6 - To record, analyze, interpret and critically evaluate Cauchy'sconstant and artmann's interpolation formula experimentally.

323	PC17P6	Major Practical VI - Physics Lab VI Major Practical VII - Physics Lab VII		 PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 3 - To create innovative ideas through laboratory experiments. PO 3 - To face challenging competitive examinations that offer rewarding careers in science and education. 	 PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply havorledge of principles, concepts in Physics and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 3 - To apply hkowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the ortical reasoning and computing skills to analyze and solve problems in Physics. PSO 4 - To apply the critical reasoning and computing skills to analyze their local, national and global impact. PSO 4 - To apply the observed experimental data and relate the results with theoretical expectations. PSO 4 - To apply the critical reasoning and computing skills to analyze they observed experimental data and relate the results with theoretical expectations. PSO 4 - To actolop onterprenenturial skills, empowered according to the PSO 4 - To covelop onterprenenturial skills, empowered according to the PSO 4 - To covelop onterprenenturial skills, empowered according to the PSO 4 - To cov	CO 1 - To demonstrate the experimental techniques and develop competence in handling optical instruments. CO 2 - To demonstrate an understanding of the scientific method and apply it in practice. CO 3 - To analyse the diffraction and dispersion phenomena in optical elements using spectrometer. CO 4 - To measure the various optical parameters using optical elements. CO 5 - To revelop practical hands-on experience applying widely used techniques to investigate optical phenomena. CO 6 - To revelop practical phands-on experience applying widely used techniques to investigate optical phenomena. CO 6 - To revelop tractical hands-on experience applying widely used techniques to investigate optical phenomena. CO 6 - To revelop tractical hands-on experience applying widely used techniques to investigate optical phenomena. CO 6 - To revelop tractical hands-on experience applying widely used techniques to investigate optical phenomena. CO 1 - To understand the principles of object oriented program to construct computer programs and modeling of experimental data for the solution of problems in Physics. CO 3 - To formulate the applications of pointers and virtual functions . CO 4 - To distinguish formatted and unformatted I/O operations. CO 5 - To develop programs using constructor, destructor, operator overloading and inheritance. CO 6 - To analyze the concepts trained in the computer lab activities and provide an understanding of data acquisition and analysis.
325	PSK176	SBC -Project		PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education.	INO 7 To develop underpetitional status, tupowteed according of the professional requirement and become self-dependent. PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 5 - To analyze the observed experimental data and relate the results with theoretical expectations. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To explore new areas of research in Physics . CO 2 - To analyze a research problem and construct tools for data collection. CO 3 - To write research reports and present results in the scientific community. CO 4 - To develop skills to serve in science related industries and agencies. CO 5 - To develop skills to publish articles in reputed journals.
326	PC17S1	Self Learning Course - Physics for Competitive Examination - I		 PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. 	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics.PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics.PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology.PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To recall the principles of mechanics and conservation laws;understand the concept of fluid dynamics. CO 2 - To examine the various aberrations and geometry involved in optics. CO 3 - To apply the laws of thermodynamics on heat phenomena.
327	PC17S2	Self Learning Course - Physics for Competitive Examination - II		 PO 1 - To apply the acquired scientific knowledge to face day to day needs. PO 2 - To create innovative ideas through laboratory experiments. PO 3 - To carry out field works and projects independently and in collaboration with other institution. PO 5 - To face challenging competitive examinations that offer rewarding careers in science and education. 	PSO 1 - To understand the core theories and principles of Physics which include mechanics, thermodynamics, electronics, material science, etc. PSO 2 - To develop extensive comprehension of fundamental and diverse applications of Physics. PSO 3 - To apply knowledge of principles, concepts in Physics and analyze their local, national and global impact. PSO 4 - To apply the critical reasoning and computing skills to analyze and solve problems in Physics. PSO 6 - To communicate appropriately and effectively, in a scientific context using present technology. PSO 7 - To develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	CO 1 - To recall the principles of mechanics and conservation laws;understand the concept of fluid dynamics. CO 2 - To examine the various aberrations and geometry involved in optics;apply the laws of thermodynamics on heat phenomena.
328	PP1711	Core I - Classical and Statistical Mechanics	6	2 PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and innovative ideas.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.)PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 5 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To define the basic mechanical concepts related to single and system of particles. CO 2 - To apply various conservation laws in solution of physical problems . CO 3 - To discuss and understand the motion of a mechanical system using Lagrange and Hamiltonian Formulation. CO 4 - To explain the origin of coriolis and centrifugal terms in the equation of motion in a rotating frame. CO 5 - To distinguish between stable and unstable equilibrium. CO 6 - To develop a fundamental knowledge of classical and quantum statistical mechanics and relate the macroscopic thermodynamics and microscopicstatistical mechanics using mathematical methods. CO 8 - To explain different statistical resmbles, their distributions and kinetic process leading to equilibrium.
329	PP1712	Core II - Electromagnetic Theory Methods		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL PO 5 - To carry out internship programme and research projects to develop scientific skills and	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.), PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 2 - To demonstrate proficiency in analyzing, applying and solving	CO 1 - To outline the fundamental laws of electrodynamics based on Maxwell's equations. CO 2 - To define and derive expressions for the energy of electrostatic and magnetostatic fields. CO 3 - To explain the Poyntings theorem based on Maxwells equations and interpret the terms in the theorem physically . CO 4 - To solve potential problems in simple geometries using separation of variables and the method of images. CO 5 - To determine the electrical properties of materials and solve the solutions of the wave equation as plane waves in source. CO 6 - To analyze the wave polarization, and reflection/transmission of plane waves in homogenous Media.
330	PP1713	Core III – Numerical and Computational methods		PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and	PSO 1 - To have vell-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, MonoPhysics, Microprocessor etc.)PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 5 - To demonstrate proficiency in analyzing, applying and solving	CO 1 - To understand the theoretical and practical aspects of the use of numerical methods. CO 2 - To explain theory, algorithms, implementations and analysis of output for numerical methods. CO 3 - To choose appropriate numerical methods to apply for various problems in science. CO 4 - To infer numerical method for various mathematical operations and tasks. CO 5 - To evaluate a function using the appropriatenumerical method . CO 6 - To make use of numerical packages such as MATLAB.

331	PP1714	Elective I – (a) Experimental Techniques Elective I – (b) Photonics			N	PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurila pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Multematical Physics, Quantum Mechanics, Solid State Physics, NonePhysics, Nicroprocessor etc.)PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy. Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.)PSO 2 - To acquire skills in performing advanced Physics, NanoPhysics, Microprocessor etc.)PSO 2 - To acquire skills in performing advanced Physics, NanoPhysics, Microprocessor etc.)PSO 2 - To acquire skills in performing advanced Physics, SPSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, PSO 4 - To apply and interpret Physics principles in various physical observations.PSO 4 - To apply and interpret Physics principles in various physical observations.	 CO 1 - To understand the different types of error and curve fitting techniques involved in physical measurement. CO 2 - To relate signal to noise ratio and analyse signal to noise enhancement. CO 3 - To analyse the functioning of various types of nuclear radiation measurement and thermal analysis techniques. CO 4 - To assess the method of measurement of mass and pressure using mass spectrometers, and gauges and vacuum production techniques. CO 5 - To understand the spectroscopic behaviour of molecules and working/application ofkifferent types of lasers. CO 4 - To aissty different methods of interaction approxements. CO 1 - To list the optical properties of solids. CO 2 - To explain the theories of different optical properties. CO 4 - To compare different types of laser and their application. CO 5 - To apply new developments in laser technology .
333	PP1721	Core IV – Condensed Matter Physics				PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Muhtematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.	CO 1 - To understand the importance of Solid State materials and classify them based on basic concepts. (atomic arrangement, microstructure and crystal binding). CO 2 - To explain the theory of lattice vibrations and thermal properties of solids;Formulate the problem of electrons in a periodic potential. CO 3 - To understand the physical characteristics of solids in terms of their band-structure. CO 4 - To discuss the physical principles of different types of electric and magnetic phenomena in solid materials and relate this to macroscopically measured physical quantities. CO 5 - To elaborate the properties and applications of
334	PP1722	Core V - Mathematical Physics				PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and	PSO 1 - To have vell-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.	CO 1 - To explain cauchy's theorem and its consequences including cauchy's integral formula. CO 2 - To evaluate residues and apply the residue theorem to evaluate integrals. CO 3 - To determine the series solutions and the recurrence relations and solve problems associated with them. CO 4 - To discuss the basic principles and methods used for the analysis of partial differential equations and apply the techniques to related problems. CO 6 - To discuss the concepts of various tensors and their applications.
335	PP1723	Core VI – Quantum Mechanics		Y		IPO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and innovative ideas.	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Chassical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving scientific problems.	CO 1 - To understand the concept of wave function and thepostulates of quantum mechanics. CO 2 - To deduce time dependent and time independent equation and solve them for simple potentials. CO 3 - To evaluate the eigen values and eigen function spin and total angular momenta and determine the matrices. CO 4 - To develop time independent perturbation theory and use approximation methods. CO 5 - To utilize time dependent perturbation theory to discuss absorption and emission of radiation for harmonic perturbation. CO 6 - To understand the concepts of scattering and derive expressions for scattering amplitude using Born approximation and partial wave analysis;Formulate Klein-Gordan and Dirac equations and discuss the applications.
336	PP1724	Elective II – (a) Crystal Growth Techniques and Thin Films Technology				PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and	PSO 1 - To have vell-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Niteroprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physical observations. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving	CO 1 - To understand the various theories and formulation related to crystal growth. CO 2 - To analyse the different methods of crystal growth. CO 3 - To apply the advanced crystal growth techniques. CO 4 - To assess the nature/characteristics and deposition technology of thin film. CO 5 - To explain the process of conduction in films and to examine the various applications of thin film.
337	PP1725	rElective II – (b) Communication Physics	_			IFO 1-10 recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and	PSO 1 - 10 nave well-detined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills narging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving etc.	CO 1 - 10 understand the basic concepts of modulation techniques in analog and digital communications. CO 2 - To knowledge about the technologies used in wireless, satellite, fiber optics communication systems. CO 3 - To evaluate fundamental communication system parameters. CO 4 - To outline the basic concepts and characters of a digital communication system. CO 5 - To apply Physics principles in communication technology.
338	PP17P1	Practical I - Advanced Physics Lab - I (General Physics)				PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL PO 5 - To carry out internship programme and research projects to develop scientific skills and	PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, MonoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving	CO 1 - To demonstrate practical skills to work with complex problems and advanced experimental equipment. CO 2 - To develop a practical knowledge in Hall Effect and in determination of Magneto resistance. CO 3 - To develop experiments practical experience in LASER. CO 4 - To measure and compare the dielectric constant of various liquids. CO 5 - To apply Ultrasonic Interferometers to determine the velocity of sound. CO 6 - To analyse the parameters of dielectric crystals experimentally.

1 1 1 1	PP17P2	Practical II - Advanced			Т	PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To understand the basic concent of Object Oriented
559	111/12	Physics I ab - II		Ľ		natural phenomena	experimental methods of advanced Physics (Classical Mechanics	Programming
		(Programming with				PO 2 - To relate the theory and practical knowledge	Mathematical Physics, Quantum Mechanics, Solid State Physics,	CO 2 - To interpret the theoretical formulation for physical
		C++)				to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	phenomena and apply experimental numerical simulations
						PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	methods to find the solution.
						industry, government, academia, research,	PSO 2 - To acquire skills in performing advanced Physics experiments	CO 3 - To apply computational methods and numerical algorithms
						entrepreneurial pursuits and consulting firms.	and projects using modern technology and numerical simulations.	to problems in advanced Physics using C++ programming.
						PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	CO 4 - To develop a basic knowledge in high level programming
						competitive examinations like NET, GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	languages.
						PO 5 - To carry out internship programme and	PSO 4 - To apply and interpret Physics principles in various physical observations	
						research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing applying and solving	
				_	_		To be to demonstrate protected in analyzing, apprying and borring	
340	PP1731	Core VII - Integrated		21	ᆀ	PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To understand the basic operation, features and parameters
		Electronics				PO 2 To relate the theory and practical knowledge	Mathematical Physics, Quantum Machanics, Solid Stata Physics	applications
						to solve the problems of the society	Molecular Spectroscopy Integrated Electronics, AstroPhysics,	applications.
						PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	digital system.
						industry, government, academia, research,	PSO 2 - To acquire skills in performing advanced Physics experiments	CO 3 - To assess the working of combinational circuits.
						entrepreneurial pursuits and consulting firms.	and projects using modern technology and numerical simulations.	CO 4 - To design various synchronous and asynchronous
						PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	sequential circuits.
						competitive examinations like NET, GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	CO 5 - To understand the characteristics of op-amps and the
						TOFEL.	PSO 4 - To apply and interpret Physics principles in various physical	applications of op-amps.
						PO 5 - To carry out internship programme and	observations.	CO 6 - To analyse the behavior of active filters and IC555.
						research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	
341	PP1732	Core VIII -			6	PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To identify/ Explain the operation of various components
		Microprocessor and				natural phenomena.	experimental methods of advanced Physics (Classical Mechanics,	of the microprocessor 8085.
		Microcontroller				PO 2 - To relate the theory and practical knowledge	Mathematical Physics, Quantum Mechanics, Solid State Physics,	CO 2 - To relate and explain the various addressing modes and the
						to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	instruction set of 8085 microprocessor.
						PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	CO 3 - To develop skill in writing simple programs for 8085
						industry, government, academia, research,	PSO 2 - To acquire skills in performing advanced Physics experiments	microprocessor.
						PO 4. To free and succeed in high level	and projects using modern technology and numerical simulations.	cO 4 - To understand the various interrupts of 8085
						competitive examinations like NET GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics	CO 5 - To experiment with the common applications of
	1					TOFEL.	PSO 4 - To apply and interpret Physics principles in various physical	microprocessor.
	1					PO 5 - To carry out internship programme and	observations.	CO 6 - To explain the architecture of 8051 microcontroller .
						research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	
342	PP1733	Elective III - (a)			5	PO 1 - To recomize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concents and	CO 1 - To perceive the historical evolution of solar system and
542	111/55	Physics of the Cosmos			6	natural phenomena	experimental methods of advanced Physics (Classical Mechanics	universe
		r nysies or the cosmos				PO 2 - To relate the theory and practical knowledge	Mathematical Physics, Quantum Mechanics, Solid State Physics,	CO 2 - To describe the principles of Physics in the formation of
						to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	astronomical objects like planets-Satellites - Asteroids and
						PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	Comets.
						industry, government, academia, research,	PSO 2 - To acquire skills in performing advanced Physics experiments	CO 3 - To examine the requirements and limitations of
						entrepreneurial pursuits and consulting firms.	and projects using modern technology and numerical simulations.	instrumentation for modern astrophysical observations. (Optical
						PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	telescopes and Radio telescopes).
						competitive examinations like NET, GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	CO 4 - To explain the basic issues involved in present day
						TOFEL.	PSO 4 - To apply and interpret Physics principles in various physical	astrophysical investigations. (Red shift and the expansion of the
						PO 5 - To carry out internship programme and	observations.	universe).
						research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	CO 5 - To analyse the formation of binary stars, multiple stars,
					_			
343	PP1734	Elective III – (b)		Ŀ	ᆀヒ	PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To understand the various Radiation sources and its
		Radiation Physics				natural phenomena.	experimental methods of advanced Physics (Classical Mechanics,	interaction with matter.
						PO 2 - To relate the theory and practical knowledge	Mathematical Physics, Quantum Mechanics, Solid State Physics,	CO 2 - To understand the Design features of the radiation
						to solve the problems of the society.	Molecular Spectroscopy, integrated Electronics, AstroPhysics,	detectors and the accelerators.
						industry government academia research	PSO 2 To acquire skills in performing advanced Physics experiments	CO 4 To interpret the Rediction designator principles
						entrepreneurial pursuits and consulting firms	and projects using modern technology and numerical simulations	CO 5 - To apply the various radiations in industrial field for
						PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	co 5 To upply the various radiations in medistrial field for
							1	scientific development.
						competitive examinations like NET, GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	scientific development. CO 6 - To identify and apply the radiation for therapy and for
						competitive examinations like NET, GATE and TOFEL.	nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical	scientific development. CO 6 - To identify and apply the radiation for therapy and for diagnosis purposes.
						competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and	nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations.	scientific development . CO 6 - To identify and apply the radiation for therapy and for diagnosis purposes.
						competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and	nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving	scientific development . CO 6 - To identify and apply the radiation for therapy and for diagnosis purposes.
344	PP17P4	Research Project	Q			competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind	nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and	scientific development . CO 6 - To identify and apply the radiation for therapy and for diagnosis purposes. CO 1 - To explore new areas of research in Physics .
344	PP17P4	Research Project	Ø		20	competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena.	nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics,	scientific development . CO 6 - To identify and apply the radiation for therapy and for diagnosis purposes. CO 1 - To explore new areas of research in Physics . CO 2 - To analyze a research problem and construct tools for data
344	PP17P4	Research Project	Ø		20	competitive examinations like NET, GATE and TOFFL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge	nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics,	scientific development . CO 6 - To identify and apply the radiation for therapy and for diagnosis purposes. CO 1 - To explore new areas of research in Physics . CO 2 - To analyze a research problem and construct tools for data collection.
344	PP17P4	Research Project	Ø		26	competitive examinations like NET, GATE and TOFFL PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society.	nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	scientific development . CO 6 - To identify and apply the radiation for therapy and for diagnosis purposes. CO 1 - To explore new areas of research in Physics . CO 2 - To analyze a research problem and construct tools for data collection. CO 3 - To write research reports and present results in the
344	PP17P4	Research Project	Ø		26	competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in	nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.)	scientific development . CO 6 - To identify and apply the radiation for therapy and for diagnosis purposes. CO 1 - To explore new areas of research in Physics . CO 2 - To analyze a research problem and construct tools for data collection. CO 3 - To write research reports and present results in the scientific community.
344	PP17P4	Research Project	Ø		20	competitive examinations like NET, GATE and TOFFL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research,	nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments	scientific development . CO 6 - To identify and apply the radiation for therapy and for diagnosis purposes. CO 1 - To explore new areas of research in Physics . CO 2 - To analyze a research problem and construct tools for data collection. CO 3 - To write research reports and present results in the scientific community. CO 4 - To develop skills to serve in science related industries and
344	PP17P4	Research Project	Ø		26	competitive examinations like NET, GATE and TOFFL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms.	nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Mathematical Physics, Quantum Mechanics, Solid State Physics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations.	scientific development . CO 6 - To identify and apply the radiation for therapy and for diagnosis purposes. CO 1 - To explore new areas of research in Physics . CO 2 - To analyze a research problem and construct tools for data collection. CO 3 - To write research reports and present results in the scientific community. CO 4 - To develop skills to serve in science related industries and agencies.
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344 345 346	PP17P4	Research Project Self Learning Course - Physics for Lectureship Examination – I Core IX – Material Science	S			competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 1 - To recognize the scientific skills and PO 1 - To recognize the scientific skills and	nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscoy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontires of Physics, PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics, Solid State Physics, ManoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics, NanoPhysics, Microprocessor etc.) PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, ManoPhysics, Microprocessor etc.)	scientific development . CO 6 - To identify and apply the radiation for therapy and for diagnosis purposes. CO 1 - To explore new areas of research in Physics . CO 2 - To analyze a research problem and construct tools for data collection. CO 3 - To write research reports and present results in the scientific community. CO 4 - To develop skills to serve in science related industries and agencies. CO 5 - To develop skills to publish articles in reputed journals. CO 1 - To familiarize with a range of mathematical methods that are essential for solving advanced problems in theoretical Physics. CO 2 - To model mechanical systems, both in inertial and rotating frames, using Lagrange and Hamilton equations. CO 3 - To understand the theory and methods of statistical Physics advanced Physical phenomena of nature. CO 4 - To understand the theory and methods of statistical Physics and thermodynamics. CO 1 - To understand phase diagrams and relate to the design and control of heat treating procedures. CO 2 - To analyze the elastic behavior of materials.
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344 345 346	PP17P4 PP17S1 PP1741	Research Project Self Learning Course - Physics for Lectureship Examination - 1 Core IX – Material Science				competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To recognize the scientific facts behind natural phenomena. PO 1 - To recognize the scientific facts behind natural phenomena. PO 1 - To recognize the scientific facts behind natural phenomena.	nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscoy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics, Solid State Physics, Molecular Spectroscoy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quan	 scientific development . CO 6 - To identify and apply the radiation for therapy and for diagnosis purposes. CO 1 - To explore new areas of research in Physics . CO 2 - To analyze a research problem and construct tools for data collection. CO 3 - To write research reports and present results in the scientific community. CO 4 - To develop skills to serve in science related industries and agencies. CO 5 - To develop skills to publish articles in reputed journals. CO 1 - To familiarize with a range of mathematical methods that are essential for solving advanced problems in theoretical Physics. CO 2 - To develop skills to publish articles in and rotating frames, using Lagrange and Hamilton equations. CO 3 - To gain insight into the physical nature of electric and magnetic phenomena. CO 4 - To to understand the theory and methods of statistical Physics and thermodynamics. CO 1 - To understand phase diagrams and relate to the design and control of heat treating procedures. CO 2 - To analyze the elastic behavior of materials. CO 3 - To review the mechanical size of materials. CO 4 - To use the mechanical size of materials. CO 4 - To use description of materials. CO 4 - To to welf the theory of materials. CO 4 - To to welf the theory of materials. CO 4 - To to welf the mechanisms involved in oxidation and corrosion of materials.
344	PP17P4	Research Project Self Learning Course - Physics for Lectureship Examination – I Core IX – Material Science				competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level	nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscoy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontires of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontires of Physics, NSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electro	scientific development . CO 6 - To identify and apply the radiation for therapy and for diagnosis purposes. CO 1 - To explore new areas of research in Physics . CO 2 - To analyze a research problem and construct tools for data collection. CO 3 - To write research reports and present results in the scientific community. CO 4 - To develop skills to serve in science related industries and agencies. CO 5 - To develop skills to publish articles in reputed journals. CO 1 - To familiarize with a range of mathematical methods that are essential for solving advanced problems in theoretical Physics. CO 2 - To nodel mechanical systems, both in inertial and rotating frames, using Lagrange and Hamilton equations. CO 3 - To autoextand the physical nature of electric and magnetic phenomena. CO 4 - To use quantum mechanical principles to analyze advanced Physical phenomena of nature. CO 5 - To understand the theory and methods of statistical Physics and thermodynamics. CO 1 - To unalyze the elastic behavior of materials. CO 1 - To unalyze the nature of dislocations in materials and the role they play in the deformation processes. CO 4 - To review the mechanisms involved in oxidation and corrosion of materials.
344	PP17P4	Research Project Self Learning Course - Physics for Lectureship Examination – 1 Core IX – Material Science				competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific facts behind natural phenomena. PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. 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347	PP17/2	Core X - Nuclear and	T		I.	PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concents and	CO 1 - To understand the properties of Nuclear forces and outline
547	111/42	Particle Physics			e	natural phenomena.	experimental methods of advanced Physics (Classical Mechanics.	their behavioral formulation.
						PO 2 - To relate the theory and practical knowledge	Mathematical Physics, Quantum Mechanics, Solid State Physics,	CO 2 - To interpret the behavior and properties of the deuteron in
						to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	the ground and excited state.
						PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	CO 3 - To analyze the different nuclear models of the nucleus and
						industry, government, academia, research, entrepreneurial pursuits and consulting firms	PSO 2 - 10 acquire skills in performing advanced Physics experiments	examine the application of the shell model of nucleus. CO(4) To explain the characteristics and effect of radioactive
						PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	decay phenomena.
						competitive examinations like NET, GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	CO 5 - To discuss the outcome of various types of nuclear
						TOFEL.	PSO 4 - To apply and interpret Physics principles in various physical	reactions.
						PO 5 - To carry out internship programme and	observations.	CO 6 - To analyse the working of nuclear reactors.
				,		research projects to develop scientific skrifs and	PSO 5 - To demonstrate proticiency in analyzing, applying and solving	CO 7 - 10 examine the Particle Physics phenomena and their
348	PP1743	Core XI - Molecular		ŀ	ᆀビ	O PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To apply basic spectroscopic techniques.
		specifoscopy				PO 2 - To relate the theory and practical knowledge	Mathematical Physics, Quantum Mechanics, Solid State Physics,	CO 3 - To understand the molecular interactions in different
						to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	spectroscopic methods.
						PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	CO 4 - To analyze the characteristics of rotational spectra and
						industry, government, academia, research,	PSO 2 - To acquire skills in performing advanced Physics experiments	vibrational energy of diatomic molecules.
						PO 4 - To face and succeed in high level	and projects using modern technology and numerical simulations.	NMR) for characterization of molecules
						competitive examinations like NET, GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	CO 6 - To utilize various spectroscopic methods suitable for
						TOFEL.	PSO 4 - To apply and interpret Physics principles in various physical	characterizing a molecule .
						PO 5 - To carry out internship programme and	observations.	
						research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	
349	PP17S1	Physics for Lectureship		\square		PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To familiarize with a range of mathematical methods that
		Examination – I				natural phenomena.	experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Machanics, Solid State Physics	are essential for solving advanced problems in theoretical Physics.
						to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	frames, using Lagrange and Hamilton equations.
						PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	CO 3 - To gain insight into the physical nature of electric and
						industry, government, academia, research,	PSO 2 - To acquire skills in performing advanced Physics experiments	magnetic phenomena.
						entrepreneurial pursuits and consulting firms.	and projects using modern technology and numerical simulations.	CO 4 - To use quantum mechanical principles to analyze
						PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	advanced Physical phenomena of nature.
						TOFEL.	PSO 4 - To apply and interpret Physics principles in various physical	and thermodynamics.
						PO 5 - To carry out internship programme and	observations.	u u
						research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	
350	PP1744	Elective IV - (a) Nano		ſ	26	PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To identify how basic Physics can be used to describe the
		Physics				natural phenomena.	experimental methods of advanced Physics (Classical Mechanics,	behaviour of electrons in nano-scale materials.
						PO 2 - To relate the theory and practical knowledge to solve the problems of the society.	Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, ActroPhysics	CO 2 - To explain the variation in the density of states in
						PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	CO 3 - To analyze magneto electronics and applications of
						industry, government, academia, research,	PSO 2 - To acquire skills in performing advanced Physics experiments	Nanotechnology in various fields.
						entrepreneurial pursuits and consulting firms.	and projects using modern technology and numerical simulations.	CO 4 - To explain Laser effect in Quantum well, Quantum wires
						PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	& quantum dots.
						Competitive examinations like NET, GATE and TOFEL	nuclear to cosmology to progress in the expanding frontiers of Physics.	CO 5 - To compare the structure and properties of Carbon
						PO 5 - To carry out internship programme and	observations.	CO 6 - To discuss the applications of Ouantum Hetro structures
						research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	and super lattices.
						innovative ideas.	scientific problems.	CO 7 - To develop key concepts in Single electron transistor,
351	PP1745	Elective IV - (b)			Ŀ	PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To explain the need for a classical theoretical approach to
		Quantum Field Theory				natural phenomena.	experimental methods of advanced Physics (Classical Mechanics,	quantum theory.
						PO 2 - To relate the theory and practical knowledge	Mathematical Physics, Quantum Mechanics, Solid State Physics,	CO 2 - To interpret combinations in different phases of field
						PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	CO 3 - To examine the significance of Neopher's theorem.
						industry, government, academia, research,	PSO 2 - To acquire skills in performing advanced Physics experiments	CO 4 - To solve problems based on Feynman diagrams.
						entrepreneurial pursuits and consulting firms.	and projects using modern technology and numerical simulations.	CO 5 - To solve problems based on Feynman diagrams.
						PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	CO 6 - To understand the concepts of field quantization.
						competitive examinations like NET. GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	CO / - To design calculation techniques for quantum
						TOFFI	PSO 4 - To apply and interpret Physics principles in various physical	electrodynamics
						TOFEL. PO 5 - To carry out internship programme and	PSO 4 - To apply and interpret Physics principles in various physical observations.	electrodynamics. CO 8 - To survey the quantization around non perturbative
352						TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and	PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving	electrodynamics. CO 8 - To survey the quantization around non perturbative solutions of quantum field theory.
	PP17P3	Practical III -				TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind	PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and	electrodynamics. CO 8 - To survey the quantization around non perturbative solutions of quantum field theory. CO 1 - To analyse the working of code converters.
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353	PP17P3	Practical III - Advanced Physics Lab – III (Electronics) Practical IV –			3	TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To recognize the scientific facts behind	PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Nicorprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and	electrodynamics. CO 8 - To survey the quantization around non perturbative solutions of quantum field theory. CO 1 - To analyse the working of code converters. CO 2 - To design various synchronous and asynchronous sequential circuits and study their working. CO 3 - To analyse the applications of op- amps. CO 4 - To analyse the behavior of counters. CO 5 - To analyse the behavior of electronic circuits. CO 1 - To experiment with assembly language programming on
353	PP17P3	Practical III - Advanced Physics Lab – III (Electronics) Practical IV – Advanced Physics Lab			E	TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena.	PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, NanoPhysics, Niteroprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics,	electrodynamics. CO 8 - To survey the quantization around non perturbative solutions of quantum field theory. CO 1 - To analyse the working of code converters. CO 2 - To design various synchronous and asynchronous sequential circuits and study their working. CO 3 - To analyse the baphications of op- amps. CO 4 - To analyse the baphicro of counters. CO 5 - To analyse the working of electronic circuits. CO 1 - To experiment with assembly language programming on 8085 microprocessor.
353	PP17P3 PP17P4	Practical III - Advanced Physics Lab – III (Electronics) Practical IV – Advanced Physics Lab – IV (Microprocessor			E	 TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge 	PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics, Solid State Physics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Mathematical Physics, Version Physics, V	electrodynamics. CO 8 - To survey the quantization around non perturbative solutions of quantum field theory. CO 1 - To analyse the working of code converters. CO 2 - To design various synchronous and asynchronous sequential circuits and study their working. CO 3 - To analyse the applications of op- amps. CO 4 - To analyse the behavior of counters. CO 5 - To analyse the working of electronic circuits. CO 1 - To experiment with assembly language programming on 8085 microprocessor. CO 2 - To apply assembly language programming on
353	PP17P3 PP17P4	Practical III - Advanced Physics Lab – III (Electronics) Practical IV – Advanced Physics Lab – IV (Microprocessor and Micro Controller)			E E	 TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out intenship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To meange supceed the unchardeneous in the society. 	PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Qanturn Mechanics, Solid State Physics, NanoPhysics, Nitroprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To acquire skills in progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Qanturn Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, ManoPhysics, Microprocessor etc.)	electrodynamics. CO 8 - To survey the quantization around non perturbative solutions of quantum field theory. CO 1 - To analyse the working of code converters. CO 2 - To design various synchronous and asynchronous sequential circuits and study their working. CO 3 - To analyse the applications of op – amps. CO 4 - To analyse the behavior of counters. CO 5 - To analyse the working of electronic circuits. CO 1 - To experiment with assembly language programming on 8085 microprocessor. CO 2 - To apply assembly language programming on microprocessor.
353	PP17P3	Practical III - Advanced Physics Lab – III (Electronics) Practical IV – Advanced Physics Lab – IV (Microprocessor and Micro Controller)			E	 TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To repare successful professionals in industry, government, academia, research 	PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Molecular Spectroscopy etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in neforming advanced Physics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills on reforming advanced Physics, PSO 2 - To acquire skills on reforming advanced Physics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics, PSO 2 - To acquire skills in performing advanced Physics, PSO 2 - To acquire skills in performing advanced Physics, PSO 2 - To acquire skills in performing advanced Physics, PSO 2 - To acquire skills in performing advanced Physics, PSO 2 - To acquire skills in performing advanced Physics, PSO 2 - To acquire skills in performing advanced Physics, PSO 2 - To acquire skills in performing advanced Physics, PSO 2 - To acquire skills in performing advanced Physics, PSO 2 - To acquire skills in performing advanced Physics, PSO 2 - To acquire skills in performing advanced Physics, PSO 2 - To acqu	electrodynamics. CO 8 - To survey the quantization around non perturbative solutions of quantum field theory. CO 1 - To analyse the working of code converters. CO 2 - To design various synchronous and asynchronous sequential circuits and study their working. CO 3 - To analyse the baphications of op- amps. CO 4 - To analyse the baphications of counters. CO 5 - To analyse the working of electronic circuits. CO 1 - To experiment with assembly language programming on 8085 microprocessor. CO 2 - To analyse the interfacing of microprocessor 8085 with I/O devices.
353	PP17P3	Practical III - Advanced Physics Lab – III (Electronics) Practical IV – Advanced Physics Lab – IV (Microprocessor and Micro Controller)			E E	TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and antural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To grepare successful professionals in industry, government, academia, research, enterpreneurial pursuits and consulting firms.	PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical sillin ranging from nuclear to cosmology to progress in the expanding frontiers of Physical observations. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics, Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Nolocluar Spectroscopy. Integrated Electronics, AstroPhysics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics, experiments and projects using modern technology and numerical simulations.	electrodynamics. CO 8 - To survey the quantization around non perturbative solutions of quantum field theory. CO 1 - To analyse the working of code converters. CO 2 - To design various synchronous and asynchronous sequential circuits and study their working. CO 3 - To analyse the baphications of op- amps. CO 4 - To analyse the baphicro of counters. CO 5 - To analyse the working of electronic circuits. CO 1 - To experiment with assembly language programming on 8085 microprocessor. CO 3 - To analyse the interfacing of microprocessor 8085 with I/O devices. CO 4 - To analyse the interfacing of microprocessor 8085 with I/O devices.
353	PP17P3	Practical III - Advanced Physics Lab – III (Electronics) Practical IV – Advanced Physics Lab – IV (Microprocessor and Micro Controller)			6	 TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level 	PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics, Solid State Physics, ManePhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics, PSO, Winterprocessor etc.) PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics, Solid State Physics, ManePhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics, PSO 3 - To denomstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics, Solid State Physics, ManoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from	electrodynamics. CO 8 - To survey the quantization around non perturbative solutions of quantum field theory. CO 1 - To analyse the working of code converters. CO 2 - To design various synchronous and asynchronous sequential circuits and study their working. CO 3 - To analyse the applications of op- amps. CO 4 - To analyse the behavior of counters. CO 5 - To analyse the working of electronic circuits. CO 1 - To experiment with assembly language programming on 8065 microprocessor. CO 2 - To analyse the interfacing of microprocessor 8085 with I/O devices. CO 4 - To apply assembly language programs for 8051 microcontroller.
353	PP17P3	Practical III - Advanced Physics Lab – III (Electronics) Practical IV – Advanced Physics Lab – IV (Microprocessor and Micro Controller)			6	 TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succe of in high level competitive examinations like NET, GATE and TOFET. 	PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Qatturn Mechanics, Solid State Physics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics, Solid State Physics, Mathematical Physics, Classical Mechanics, Mathematical Physics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Molecular Spectroscopy, Integrated Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, NonoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using moderne technology and numerical sillit araging from nuclear to cosmology to progress in the expanding frontiers of Physics, PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, PSO 4 - To apple and buyed physics Physics Physics is provide to advanced Physics experiments Physics and projects using modern technology and numerical sillit ranging from nuclear to cosmology to progress in the expanding frontiers of Physics PSO 4 - To apple and intervent Physics Physics is Physics and projects using modern technology and numerical sillit ranging from nuclear to cosmology to progress in the expanding frontiers of Physics PSO 4 -	electrodynamics. CO 8 - To survey the quantization around non perturbative solutions of quantum field theory. CO 1 - To analyse the working of code converters. CO 2 - To design various synchronous and asynchronous sequential circuits and study their working. CO 3 - To analyse the applications of op- amps. CO 4 - To analyse the behavior of counters. CO 5 - To analyse the working of electronic circuits. CO 1 - To experiment with assembly language programming on 8085 microprocessor. CO 2 - To apply assembly language programming on microprocessor. CO 3 - To analyse the interfacing of microprocessor 8085 with IO devices. CO 4 - To apply assembly language programs for 8051 microcontroller.
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353	PP17P3	Practical III - Advanced Physics Lab – III (Electronics) Practical IV – Advanced Physics Lab – IV (Microprocessor and Micro Controller) Self Learning Course - Physics for Lectureship Examination – II			Ē	 TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 1 - To recognize the scientific facts behind natural phenomena. PO 1 - To recognize the scientific facts behind natural phenomena. PO 1 - To recognize the scientific facts behind natural phenomena. PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. 	 PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, ManoPhysics, Nicroprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physical observations. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and projects using moderne dePhysics. Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics, Solid State Physics, PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and projects using modern technology and numerical simulations. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical	electrodynamics. CO 8 - To survey the quantization around non perturbative solutions of quantum field theory. CO 1 - To analyse the working of code converters. CO 2 - To design various synchronous and asynchronous sequential circuits and study their working. CO 3 - To analyse the applications of op- amps. CO 4 - To analyse the baptive of counters. CO 5 - To analyse the working of electronic circuits. CO 1 - To experiment with assembly language programming on 8085 microprocessor. CO 2 - To analyse the interfacing of microprocessor 8085 with I/O devices. CO 3 - To analyse the interfacing of microprocessor 8085 with I/O devices. CO 4 - To apply assembly language programs for 8051 microprocessor. CO 1 - To understand the physical construction, working and operational characteristics of semiconductor devices. CO 2 - To atunk nowledge on the structure and dynamics of the molecules through various theories.
353	PP17P3 PP17P4 PP17P4	Practical III - Advanced Physics Lab – III (Electronics) Practical IV – Advanced Physics Lab – IV (Microprocessor and Micro Controller) Self Learning Course - Physics for Lectureship Examination – II			6	 TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research, projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, and projects to develop scientific skills and roteful. PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepares successful professionals in infurty. PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. 	 PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, NanoPhysics, Niteroprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and projects using moderne cell Physics (Classical Mechanics, MandPhysics, Microprocessor etc.) PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers, NanoPhysics, Nicroprocessor etc.) PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers, Niscoprocessor etc.) PSO 3 - To apply and interpret Physics principles in various physical observations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and mitterpret Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, NanoPhysics, Microprocessor etc.) PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Machanes, Solid State	electrodynamics. CO 8 - To survey the quantization around non perturbative solutions of quantum field theory. CO 1 - To analyse the working of code converters. CO 2 - To design various synchronous and asynchronous sequential circuits and study their working. CO 3 - To analyse the applications of op- amps. CO 4 - To analyse the behavior of counters. CO 5 - To analyse the working of electronic circuits. CO 1 - To experiment with assembly language programming on 8065 microprocessor. CO 2 - To analyse the interfacing of microprocessor 8085 with I/O devices. CO 4 - To analyse the interfacing of microprocessor 8085 with I/O devices. CO 4 - To analyse the interfacing of microprocessor 8085 with I/O devices. CO 4 - To analyse the interfacing of microprocessor 8051 microcontroller.
353	PP17P3	Practical III - Advanced Physics Lab – III (Electronics) Practical IV – Advanced Physics Lab – IV (Microprocessor and Micro Controller) Self Learning Course - Physics for Lectureship Examination – II			6	 TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To recognize the scientific facts behind natural phenomena. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. 	 PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mahematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical observations. PSO 5 - To demonstrate proficiency in analyzing, applying and solving PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, Mahematical Physics, Quantum Mechanics, Solid State Physics, NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations. PSO 3 - To develop and communicate analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics, NanoPhysics, Microprocessor etc.) PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Classical Mechanics, PSO 3 - To demonstrate proficiency in analytical skills ranging from nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 1 - To have well-defined knowledge on theoretical concepts and experimental methods of advanced Physics (Slassical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics, Molecular Spectroscopy, Integr	electrodynamics. CO 8 - To survey the quantization around non perturbative solutions of quantum field theory. CO 1 - To analyse the working of code converters. CO 2 - To design various synchronous and asynchronous sequential circuits and study their working. CO 3 - To analyse the applications of op- amps. CO 4 - To analyse the behavior of counters. CO 5 - To analyse the working of electronic circuits. CO 1 - To experiment with assembly language programming on 8085 microprocessor. CO 2 - To analyse the interfacing of microprocessor 8085 with I/O devices. CO 3 - To analyse the interfacing of microprocessor 8085 with I/O devices. CO 1 - To understand the physical construction, working and operational characteristics of semiconductor devices. CO 2 - To atink nowledge on the structure and dynamics of the molecules through various theories. CO 3 - To analyce therites, environmental and technolocical
353	PP17P3	Practical III - Advanced Physics Lab – III (Electronics) Practical IV – Advanced Physics Lab – IV (Microprocessor and Micro Controller) Self Learning Course - Physics for Lectureship Examination – II			E	 TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. PO 3 - To prepare successful professionals in industry, government, academia, research, entrepreneurial pursuits and consulting firms. PO 4 - To face and succeed in high level competitive examinations like NET, GATE and TOFEL. PO 5 - To carry out internship programme and research projects to develop scientific skills and atural phenomena. PO 1 - To recognize the scientific facts behind natural phenomena. PO 2 - To relate the theory and practical knowledge to solve the problems of the society. 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255	MDD101	C1.Desfauring al Shills			DO 1. To announce the existential factor backing	DEO 1 To have well defined be used as an descentional supremeter and	CO 1. To consider and shills similar at estimical and descent
555	MPP191	forr Teaching – Learning		⊵	natural phenomena. PO 2 - To relate the theory and practical knowledge	experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics,	handle practical classes. CO 2 - To develop teaching skills and gain confidence in teaching.
					to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	
					PO 3 - To prepare successful professionals in industry government academia research	NanoPhysics, Microprocessor etc.) PSO 2 - To acquire skills in performing advanced Physics experiments	
					entrepreneurial pursuits and consulting firms.	and projects using modern technology and numerical simulations.	
					PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	
					TOFEL.	PSO 4 - To apply and interpret Physics principles in various physical	
					PO 5 - To carry out internship programme and	observations.	
					research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	
356	MPP182	C2:ResearchMethodolo		⊵	PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To assess the fundamentals of thin film preparation and
		sy			PO 2 - To relate the theory and practical knowledge	Mathematical Physics, Quantum Mechanics, Solid State Physics,	and mechanical properties.
					to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	CO 2 - To understand the basic concepts of research and its
					PO 3 - To prepare successful professionals in industry, government, academia, recearch	NanoPhysics, Microprocessor etc.)	methodologies of scholarly writing and evaluate its quality.
					entrepreneurial pursuits and consulting firms.	and projects using modern technology and numerical simulations.	of mathematical Physics.
					PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	CO 4 - To demonstrate an understanding of the basic features and
					competitive examinations like NET, GATE and TOFFI	nuclear to cosmology to progress in the expanding frontiers of Physics.	concepts of the Sun and other stars.
					PO 5 - To carry out internship programme and	observations.	applications of photonic cystals.
					research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	
357	MPP183	C3:Advanced Physics		V	PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To interpret the band structure of metals, semiconductors
					natural phenomena. PO 2 - To relate the theory and practical knowledge	experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics	and insulators.
					to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	applications of high temperature cuprate superconductors.
					PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	CO 3 - To describe the various crystal growth techniques and
					industry, government, academia, research, entrepreneurial pursuits and consulting firms.	PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations.	determine the growth parameters of crystals. CO 4 - To categorize different types of sensors and their
					PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	characteristics.
					competitive examinations like NET, GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	
					PO 5 - To carry out internship programme and	observations.	
					research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	
358	MPP184	Principles and Methods		$\mathbf{\nabla}$	PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To categorize the various crystal growth methods.
		of Crystal Growth			natural phenomena.	experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics	CO 2 - To understand the various theories of nucleation process involved in crustal growth
					to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	CO 3 - To discuss the theories of crystal growth and familiarize in
					PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	choosing an apt method for growing materials
					industry, government, academia, research, entrepreneurial pursuits and consulting firms	PSO 2 - To acquire skills in performing advanced Physics experiments and projects using modern technology and numerical simulations	CO 4 - To discuss the methods of melt growth technique for both conventional and non-conventional growth processes
					PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	CO 5 - To compile the various crystal growth techniques
					competitive examinations like NET, GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	
					PO 5 - To carry out internship programme and	observations.	
					research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	
359	MPP185	C4: Research Trends in		$\mathbf{\nabla}$	PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To list the basic properties of nanoparticles.
		Nano science and Technology			natural phenomena. PO 2 - To relate the theory and practical knowledge	experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics	CO 2 - To explain the technique involved in measuring different properties of papoparticles
		reemonogy			to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	CO 3 - To apply different methods used to control the structure of
					PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	nanoparticles
					entrepreneurial pursuits and consulting firms.	and projects using modern technology and numerical simulations.	nanoparticles in dispersed system
					PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	CO 5 - To utilise different characterisation methods to estimate
					competitive examinations like NET, GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	physical properties of nanoparticles
					PO 5 - To carry out internship programme and	observations.	
					research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	
360	MPP186	C4: Electronic		$\mathbf{\nabla}$	PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To identify the eigen values and eigen functions of
		Structure Calculations for Solids			natural phenomena. PO 2 - To relate the theory and practical knowledge	experimental methods of advanced Physics (Classical Mechanics, Mathematical Physics, Quantum Mechanics, Solid State Physics	materials using theoretical calculations.
					to solve the problems of the society.	Molecular Spectroscopy, Integrated Electronics, AstroPhysics,	an energy state at various pressures by electronic structure
					PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	calculation.
					entrepreneurial pursuits and consulting firms.	and projects using modern technology and numerical simulations.	and structural phase transition in crystalline materials.
					PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	CO 4 - To apply the FP-LMTO method in the Basic theories of
					competitive examinations like NET, GATE and TOFEL	nuclear to cosmology to progress in the expanding frontiers of Physics. PSO 4 - To apply and interpret Physics principles in various physical	electronic structure CO 5 - To explain the phenomenon of Metallization
					PO 5 - To carry out internship programme and	observations.	superconductivity and Fermi surface in materials.
					research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	CO 6 - To compare the various band structure methods suitable
					mnovauve ideas.	scientific problems.	CO 7 - To develop a deeper research experience in electronic
361	MPP19D	<u> </u>	++	+	PO 1 - To recognize the scientific facts behind	PSO 1 - To have well-defined knowledge on theoretical concepts and	CO 1 - To explore new areas of research in Physics
					natural phenomena.	experimental methods of advanced Physics (Classical Mechanics,	CO 2 - To analyze a research problem and construct tools for data
					PO 2 - To relate the theory and practical knowledge to solve the problems of the society	Mathematical Physics, Quantum Mechanics, Solid State Physics, Molecular Spectroscopy, Integrated Electronics, AstroPhysics	collection. CO 3 - To write research reports and present results in the
					PO 3 - To prepare successful professionals in	NanoPhysics, Microprocessor etc.)	scientific community.
					industry, government, academia, research,	PSO 2 - To acquire skills in performing advanced Physics experiments	CO 4 - To develop skills to serve in science related industries and
					PO 4 - To face and succeed in high level	PSO 3 - To develop and communicate analytical skills ranging from	CO 5 - To develop skills to publish articles in reputed journals.
					competitive examinations like NET, GATE and	nuclear to cosmology to progress in the expanding frontiers of Physics.	
					TOFEL. PO 5 - To carry out internship programme and	PSO 4 - To apply and interpret Physics principles in various physical observations.	
					research projects to develop scientific skills and	PSO 5 - To demonstrate proficiency in analyzing, applying and solving	