M.E.S MAMPAD COLLEGE (AUTONOMOUS)

MAMPAD COLLEGE P.O, MALAPPURAM, KERALA, INDIA, 676542

Affiliated to University of Calicut
Accredited by NAAC with A grade

Syllabus Year	2019-20
Department	Physics
Programme	BSc Physics

Programme outcome

Sl.No	Programme Outcome
PO1	Learn, design and perform experiments in the labs to demonstrate the concepts, principles and theories learned in the classrooms.
PO2	Emphasize the discipline of Physics to be the most important branch of science for pursuing the interdisciplinary and multidisciplinary higher education and/or research in interdisciplinary and multidisciplinary areas.
PO3	To emphasize the importance of Physics as the most important discipline for sustaining the existing industries and establishing new ones to create job opportunities at all levels of employment.

Programme specific out come

Sl.No	Programme Specific Outcome.
PSO1	Understand the basic concepts of methodology of science and the fundamentals of mechanics, properties of matter and electrodynamics
PSO2	Understand the theoretical basis of quantum mechanics, nuclear physics, optics, spectroscopy, solid state physics, astrophysics, statistical physics, and thermodynamics
PSO3	Understand and apply the concepts of electronics in the designing of different analog and digital circuits
PSO4	Apply and verify theoretical concepts through laboratory experiments

Continue adding rows till the POs are completely added

Course Out come (add sufficient Number of rows in each semester)

Semester	Course Code	Course Name	Course out come
I	PHY1B01	METHODOLOGY OF SCIENCE AND BASIC MECHANICS	Understand the features, methods and limitations of science
			Understand and apply the basic concepts of Newtonian Mechanics to physical systems
			Understand and apply the basic idea of work-energy theorem to physical systems
			Understand and apply the rotational dynamics of rigid bodies
			Understand the basic ideas of elasticity
II	**PHY2B02**	**MECHANICS**	Understand the features of non-inertial systems and fictitious forces
			Understand and analyze the features of central forces with respect to planetary motion
			Understand the basics ideas of harmonic OSCILLATIONS
			Understand and analyze the basics concepts of wave motion
III	PH3B03	MECHANICS	Understand the features of non-inertial systems and fictitious forces
			Understand and analyze the features of central forces with respect to planetary motion,
			Understand and apply the basic idea of work-energy theorem to physical systems
			Understand special relativity
			Understand the basic concepts of classical mechanics
IV	PH4B04	ELECTRODYNAMICS 1	Understand and apply the fundamentals of vector calculus
			Understand and analyze the electrostatic properties of physical systems
			Understand the mechanism of electric field in matter.
			Understand and analyze the magnetic properties of physical systems
			Understand the mechanism of magnetic field in matter.
V	PHY5B06	ELECTRODYNA	Understand the basic concepts of electrodynamics

		MICS II	Understand and analyze the properties of electromagnetic waves
			Understand the behavior of transient currents
			Understand the basic aspects of ac circuits
			Understand the concepts of network theorems
	PHY5B07	QUANTUM MECHANICS	Understand the particle properties of electromagnetic radiation
			Describe Rutherford – Bohr model of the atom
			Understand the wavelike properties of particles
			Understand and apply the Schrödinger equation to simple physical systems
			Apply the principles of wave mechanics to the Hydrogen atom
	PH5B08	Physical OPTICS and modern optics	Understand the fundamentals of Fermat‟s principles and geometrical optics
			Understand and apply the basic ideas of interference of light
			Understand and apply the basic ideas of diffraction of light
			Understand the basics ideas of polarization of light
			Describe the basic principles of holography and fibre optics
	PHY5B09	ELECTRONICS (ANALOG & DIGITAL)	Understand the basic principles of rectifiers and dc power supplies
			Understand the principles of transistor
			Understand the working and designing of transistor amplifiers and oscillators
			Understand the basic operation of Op – Amp and its applications
			Understand the basics of digital electronics
VI	PHY6B10	Thermal and Statistical Physics	Understand the zero and first laws of thermodynamics
			Understand the thermodynamics description of the ideal gas
			Understand the second law of thermodynamics and its applications
			Understand the basic ideas of entropy
			Understand the concepts of thermodynamic potentials and phase transitions
			Understand the basic principles of statistical physics and its applications
	PHY6B11	SOLID STATE PHYSICS, SPECTROSCOP	Understand the basic aspects of crystallography in solid state physics Understand the basic elements of spectroscopy

		Y &Lasers	Understand the basics ideas of microwave and infra red spectroscopy Understand the fundamental ideas of laser
	PHY6B12	NUCLEAR PHYSICS, PARTICLE PHYSICS and astrophysics	Understand the basic aspects of nuclear structure and fundamentals of radioactivity
			Describe the different types of nuclear reactions and their applications
			Understand the principle and working of particle detectors
			Describe the principle and working of particle accelerators
			Understand the basic principles of elementary particle physics Describe the structure and classification of galaxies
	PHY6B13	MATERIAL SCIENCE	Understand the basic ideas of bonding in materials
			Describe crystalline and non crystalline materials
			Understand the types of imperfections nad diffusion mechanisms in solids
			Describe the different properties of ceramics and polymers
			Describe the different types of material analysis rechniques
	PHY4B05	PRACTICAL I	Apply and illustrate the concepts of properties of matter through experiments
			Apply and illustrate the concepts of electricity and magnetism through experiments
			Apply and illustrate the concepts of optics through experiments
			Apply and illustrate the principles of electronics through experiments
	PHY6B15	PRACTICAL II	Apply and illustrate the concepts of properties of matter through experiments
			Apply and illustrate the concepts of electricity and magnetism through experiments
			Apply and illustrate the concepts of optics and spectroscopy through experiments
			Apply and illustrate the principles of heat through experiments
	PHY6B16	PRACTICAL III	Apply and illustrate the principles of semiconductor diode and transistor through experiments
			Apply and illustrate the principles of transistor amplifier and oscillator through experiments
			Apply and illustrate the principles of digital electronics through experiments
			Analyze and apply computational techniques in Python programming
	PHY6B17 (P)	PROJECT	Understand research methodology
			Understand and formulate a research project
			Design and implement a research project

			Identify and enumerate the scope and limitations of a research project
	PHY5D01 (3)	ELEMENTARY MEDICAL PHYSICS	Understand the basic aspects of physics of nuclear medicine
			Recognize different bioelectric signals and their instrumentation
			Understand the basic elements of X-ray imaging
			Understand the basic elements of ultrasound imaging and its advantages and disadvantages

Complementary Courses

Semester	Course Code	Course Name	Course Outcome
I	**PHY1C01**	**Properties of matter & Thermodynamics**	• Understand the basic principles of Elasticity • Understand the concepts of surface tension • Understand the aspects of viscosity • Understand the basic principles of thermodynamics
II	**PHY2C02**	**Optics, Laser & Electronics**	• Understand the basic concepts of interference and diffraction • Understand the concepts of polarization • Understand the fundamentals of electronics • Understand the important principles of laser physics
III	**PHY2C03**	**Optics, Laser & Electronics**	• Understand the basic concepts of interference and diffraction

			• Understand the concepts of polarization • Understand the fundamentals of electronics • Understand the important principles of laser physics
IV	**PHY4C04**	**Electricity, Magnetism and Nuclear physics**	• Understand the basic ideas of static and current electricity • Understand the concepts of magnetism • Describe the fundamental concepts of nuclear physics • Understand the basic ideas of cosmic rays and elementary particles
IV	**PHY4C05**	**PRACTICALS I**	Apply and illustrate the concepts of properties of matter through experiments Apply and illustrate the concepts of electricity and magnetism through experiments Apply and illustrate the concepts of optics through experiments Apply and illustrate the principles of electronics through experiments