DEPARTMENT OF PHYSICS AND ELECTRONICS
For the Academic year 2018-19

PROGRAMME OUTCOMES			
Programme	**Combination**	**Programme Outcomes**	**Programme Specific outcomes**
B.Sc.	B.Sc. – MPC Mathematics, Physics, Chemistry (TM & EM)	Possess a sound understanding of the theoretical foundation of various core subjects. Acquire analytical and logical thinking Skills necessary to pursue higher Education. Gain employment at entry level positions based on program curriculum. After the completion of UG Programme the student gets eligibility to join in PG programme, MBA, Student will be eligible to write bank PO/Clerk examinations, Civil services and other group services examinations.	**Mathematics:** Develop proficiency in high level mathematical methods, Acquire analytical and logical thinking skills **Physics:** Master a broad set of knowledge concerning the fundamental in the basic areas of Physics **Chemistry:** understand the fundamental theories, the concepts and applications of chemistry. Gains knowledge of important laboratory techniques, methods, and instrumentation.

B.Sc.	B.Sc (MPCs) Mathematics, Physics, Computer science	Expertise in the basic sciences provides the students with opportunities to go for Higher Education 2. Promotes an in- depth exploration in specificfield, current ways of thinking, new discoveries, and methodologies of the discipline. Gain employment at entry level positions based on program curriculum	**Mathematics:** Develop proficiency in high level mathematical methods, Acquire analytical and logical thinking skills **Physics:** Master a broad set of knowledge concerning the fundamentals in the basic areas of Physics. **Computer Science**: Hands-onexperience in various practical aspects of problem solving/ programming/ experimental techniques, and data analysis and presentation competence. Effectivelyuse the software - MS Excel and R-Programming.

PROGRAMME OUTCOMES			
Programme	**Combination**	**Programme Outcomes**	**Programme Specific outcomes**
B.Sc.	B.Sc (MECs) Mathematics, Physics, Computer science	Expertise in the basic sciences provides the students with opportunities to go for Higher Education 2. Promotes an in-depth exploration in specific field, current ways of thinking, new discoveries, and methodologies of the discipline. Gain employment at entry level positions based on program curriculum	**Mathematics:** Develop proficiency in high level mathematical methods, Acquireanalytical and logical thinking skills **Electronics:** Master a broad set of knowledge concerning the fundamentals in the basic areas of Electronics. **Computer Science**: Hands-on experience in various practicalaspects of problem solving/ programming/ experimental techniques, and data analysis and presentation competence. Effectively use the software - MS Excel and R- Programming.

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DEPARTMENT OF PHYSICS AND ELECTRONICS
COURSE OUTCOMES

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MECHANICS & PROPERTIES OF MATTER

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Course Outcomes

On successful completion of this course, students will be able to

CO1: Describe the physical significance of gradient of scalar field, divergence and curl of vector field. Applications of Gauss's & Green's theorems.

CO2: Describe the working of multi stage rockets, collisions in 2D & 3D. Concept of Rutherford's scattering experiment and its importance.

CO3: Apply Euler equations and analyse the processional velocity of symmetric top.

Co4:   Understand the elastic constants Y, n and K and their relatios, Classification of beams types of bending and bending moment.

CO5: Demonstrate central force with examples. Verification of Kepler's laws, application to planetary system.

CO6: Deduce the concepts of relativity, frame of reference, Lorentz transformations, length contraction and time dilation.

PRACTICAL Course Outcomes:

On successful completion of this Practical Course, students will be able to

CO1: Determine the surface tension of the liquid by capillary raise method.

CO2: Determine the viscosity of liquid by poiseuille's method.

CO3: Determine the moment of inertia of a body about an axis using Bifilar suspension.

CO4: Determine the moment of inertia of a fly wheel about an axis.

CO5: Determine the unknown frequency of the given tuning fork using the Volume resonator.

CO6: Determine the Young's modulus of the material of a rod with non-uniform bending.

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WAVES & OSCILLATIONS

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Course Outcomes

On successful completion of this course, students will be able to

CO1: Analyse the simple Harmonic Motion and its characteristics. They can also determine acceleration due to gravity 'g' by Compound pendulum & rigidity modulus by Torsion pendulum.

CO2: Apply the concept of damping to determine logarithmic decrement & quality factor. Differential equation of forced harmonic oscillator and its equation and applied in daily life.

CO3: Analyse the periodic functions like square wave, Saw tooth wave by using Fourier's theorem.

CO4: Understand the propagation of transverse waves in a stretched string and its modes of

vibration in different cases and can calculate the speed of the transverse wave in the stretched string.

CO5: Understand the propagation of longitudinal waves in a bar and its modes of vibration in different cases and can calculate the speed of the longitudinal waves in the bar.

CO6: Basic understanding of Ultrasonics, different production methods and applications.

PRACTICAL Course Outcomes:

On successful completion of this Practical Course , students will be able to
CO1: Determine the acceleration due to gravity(g) and radius of gyration(k) by compound pendulum.
CO2: Determine the coefficient of viscosity of a highly viscous liquids using searl's viscometer.
CO3: Determine the Rigidity modulus (n) of the material of wire by Torsional pendulum.
CO4: Justify the laws of vibration of stretched string - Sonometer. (K5)
CO5: Estimate standard errors - simple pendulum.
CO6: Determine the frequency of an electric vibrator using Melde's apparatus.

WAVE OPTICS

Course Outcomes:

On successful completion of this course, students will be able to
CO1: Explain about the different aberrations in lenses and their minimization methods.
CO2: Explain interference and its applications.
CO3: Distinguish between Fresnel's diffraction and Fraunhoffer diffraction and observe the diffraction patterns in the case of single slit and the diffraction grating.
CO4: Describe the construction and working of zone plate and make the comparison of zone plate with convex lens.
CO5: Explain the various methods of production of plane, circularly and polarized light and their detection and the concept of optical activity.
CO6: Comprehend the basic principle of laser, the working of He-Ne laser and Ruby lasers and their applications in different fields.
CO7: Understand the basic principle of Holography and its applications.
CO8: Understand the basic principles of fibre optic communication and its advantages.

PRACTICAL Course Outcomes:

On successful completion of this Practical Course, students will be able to

CO1: Determine the radius of curvature of a given convex lens - Newton's Rings.

CO2: Determine the dispersive power of a prism using spectrometer.

CO3: Determine wave length of light using diffraction grating – Minimum deviation method.

CO4: Estimate the resolving power of a telescope.

CO5: Determine the refractive Index of liquid - Boye's method.

CO6: Determine the refractive Index of the material of a convex lens.

THERMODYNAMICS & RADIATION PHYSICS

Course Outcomes:

On successful completion of this course, students will be able to

CO1: Understand the basic concepts of and the kinetic theory of gases, Maxwell's law of distribution of molecular speeds and transport phenomenon.

CO2: Understand Isothermal and adiabatic processes, carnot's engine and its efficiency, refrigerator, concept of entropy and T-S diagram.

CO3: Gain knowledge on Thermodynamic potentials, the formulation of Maxwell's equations and its applications.

CO4: Differentiate between principles and methods to produce low temperature and liquefy air and also understand the practical applications of substances at low temperatures.

CO5: Determine different laws and formulae in Quantum theory of radiation and measurement of radiation by using different Pyrometers.

PRACTICAL Course Outcomes:

On successful completion of this Practical Course, students will be able to

CO1: Determine heating efficiency of electric kettle by varying voltages.

CO2: Estimate the Temperature, characteristics of Thermister.

CO3: Thermal conductivity of rubber.

CO4: Measure Thermal conductivity of a bad conductor by Lee's Methods.

CO5: Determine the specific heat of a liquid by using Newton's law of cooling.

CO6: Determine the specific heat of a liquid with Joule's calorimeter by Barton's radiation method.

ELECTRICITY, MAGNETISM & ELECTRONICS

Course Outcomes

On successful completion of this course, students will be able to

CO1: Understand Gauss's law and its applications to calculate the electric field intensities in the electric fields due to various charged bodies.

CO2: Gain knowledge on Electric polarization, Electric displacement, Dielectric constant, Dielectric susceptibility and their relations.

CO3: Understand Biot-Savart's law and its applications to calculate the magnetic induction field intensities due to various current carrying conductor.

CO4: Gain knowledge on Hall effect and its applications.

CO5: Understand Faradays laws of electromagnetic induction and working of a transformer

CO6: Understand the basic laws of electricity and magnetism, deduce Maxwell equations and analyse the production of electromagnetic waves.

CO7: Gain knowledge on the working of p-n junction diode, Zener diode and BJTs and their characteristics.

CO8: Understand different number systems and their algebra, the working of different logic gates

PRACTICAL Course Outcomes:

On successful completion of this Practical Course, students will be able to

CO1: Determine the cutin voltage of given p-n junction by drawing its characteristics.

CO2: Determine the breakdown voltage of Zener diode.

CO3: Determine the frequency of AC using Sonometer.

CO4: Verify Kirchoff's laws in the electric circuits

CO5: Determine the impedance and power factor of a circuit.

CO6: study the resonance curve of LCR Series/Parallel circuit for its Resonance frequency and Q- factor.

MODERN PHYSICS

Course Outcomes

On successful completion of this course, students will be able to

CO1: Gain knowledge on Vector atom model, coupling schemes, Zeeman effect, Raman effect and its applications.

CO2: Understand the concept of matter waves and uncertainity principle.

CO3: Get familiarized with the principles of quantum mechanics and the formulation of Schrodinger wave equation and its applications.

CO4: Understand the basic properties of Nuclei, characteristics of Nuclear forces, salient features of Nuclear models and magic numbers.

CO5: Explain the theories behind the alpha and beta decay

CO4: Describe the crystal structure

CO5: Explain the basic theories of superconductivity.

PRACTICAL Course Outcomes:

On successful completion of this Practical Course, students will be able to

CO1: Determine e/m of an electron by Thomson method.

CO2: Determination of Plank's Constant by using Photo voltaic cell.

CO3: Determination of M and H by using deflection and vibration magneto meters.

CO4: Study of the operation of logic gates

CO5: Verification of De'Morgans theorem.

CO6: Design the basic logic gates with universal logic gates.

Course Outcomes

On successful completion of this course, students will be able to

CO1: Demonstrate different forms of energy resources and its role in economic development.

CO2: Describe the effects of environmental degradation, global warming, nuclear power generation

CO3: Correlate Solar, Wind, Ocean, Hydrogen energy conversions.

CO4: Analyse the conversion of bio mass into fuels, biomass plants types and design.

PRACTICAL Course Outcomes:

On successful completion of this Practical Course, students will be able to

CO1: Measure V-I characteristics of Solar cell.

CO2: Illustrate the effect of input light intensity of the performance of solar cell.

CO3: study the characteristics of the wind.

CO4: Study the characteristics of Photocell

CO5: Evaluate the performance of Solar cooker.

SOLAR THERMAL AND PHOTOVOLTAIC ASPECTS

Course Outcomes

On successful completion of this course, students will be able to

CO1: Understand basics of Solar radiation.

CO2: Understand the radiative properties and Characteristics of Materials.

CO3: Describe Flat plate collectors, collector efficiency.

CO4: Gain knowledge on the working and equivalent circuit of Solar cell.

CO5: Study the characteristics of Solarcell

CO6: Gain knowledge on Solar thermal applications.

PRACTICAL Course Outcomes:

On successful completion of this Practical Course, students will be able to

CO1: Measure Solar constant using Angstron Pyrheliometer.

CO2: Measure the efficiency of solar plate collector.

CO3: Test the Solar air dryer unit.

CO4: Study the effect of tilt angle on the efficiency of PV panel.

CO5: Determine Voltage & Current Solar Photo Voltaic panel in series.

CO6: Determine Voltage & current Solar Photo Voltaic panel in Parallel.

WIND, HYDRO & OCEAN ENERGIES

Course Outcomes

On successful completion of this course, students will be able to

CO1: Understand wind energy generation, wind speed characteristics.

CO2: Gain knowledge on Wind energy conversion systems.

CO3: Understand small hydropower systems.

CO4: Gain knowledge on Wind energy applications.

CO5: Gain knowledge on Ocean thermal, Tidal and wave energy systems.

PRACTICAL Course Outcomes:

On successful completion of this Practical Course, students will be able to

CO1: Estimate wind speed using anemometer.

CO2: Determine the characteristics of wind generator turbine.

CO3: Evaluate performance of vertical and horizontal axis wind turbine.

CO4: Estimate electric power output using Wind turbine.

ENERGY STORAGE DEVICES

Course Outcomes

On successful completion of this course, students will be able to

CO1: Analyse different modes of energy storage.

CO2: Analyse different types of electro chemical energy storage systems.

CO3: Demonstrate fuel cell components, principle and it's working.

CO4: Classify different types of fuel cells and the problems with fuel cells and theirapplications.

PRACTICAL Course Outcomes:

On successful completion of this Practical Course, students will be able to

CO1: Analyse charge and discharge characteristics of a storage battery. (K4)

CO2: Analyse charge and discharge characteristics of a storage capacitor. (K4)

CO3: Analyse charge and discharge characteristics of NI-Cd battery using solar PV cell.

CO4: Evaluate the efficiency of DC-AC converter.