



SRI Y. N. COLLEGE (AUTONOMOUS)-NARSAPUR

(Affiliated to Adikavi Nannaya University) Thrice Accredited by

NAAC at „A“ Grade

Recognized by UGC as „College with Potential for Excellence“

DEPARTMENT OF PHYSICS For the Academic year 2018-19



## PROGRAMME OUTCOMES

Programme	Combination	Programme Outcomes	Programme Specific outcomes
B.Sc.	B.Sc. – MPE (EM)	<p>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</p> <p>After the completion of UG program the student gets eligibility to join PG programme, MBA, Student will be eligible to write bank PO/Clerk examinations, Civil services and other group services examinations.</p>	<p><b>Mathematics:</b> Develop proficiency in high level mathematical methods, Acquire analytical and logical thinking skills</p> <p><b>Physics:</b> Master a broad set of knowledge concerning the fundamentals in the basic areas of Physics</p> <p><b>Electronics:</b> Master a broad set of knowledge concerning the fundamentals in the basic areas of Electronics. Hands-on experience in various practical aspects of problem solving/ programming/ experimental techniques, and data analysis and presentation competence.</p>
B.Sc.	B.Sc. – MPC (TM & EM)	<p>Posses 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</p> <p>After the completion of UG program 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.</p>	<p><b>Mathematics:</b> Develop proficiency in high level mathematical methods, Acquire analytical and logical thinking skills</p> <p><b>Physics:</b> Master a broad set of knowledge concerning the fundamental in the basic areas of Physics</p> <p><b>Chemistry:</b> understand the fundamental theories, the concepts and applications of chemistry. Gains knowledge of important laboratory techniques, methods, and instrumentation.</p>

<p><b>B.Sc.</b></p>	<p>B.Sc (MPCs) Mathematics, Physics, Computer science</p>	<p>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</p>	<p><b>Mathematics:</b> Develop proficiency in high level mathematical methods, Acquire analytical and logical thinking skills <b>Physics:</b> Master a broad set of knowledge concerning the fundamentals in the basic areas of Physics. <b>Computer Science:</b> Hands-on experience in various practical aspects of problem solving/programming/ experimental techniques, and data analysis and presentation competence. Effectively use the software - MS Excel and R-Programming.</p>
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**DEPARTMENT OF PHYSICS**  
**COURSE OUTCOMES**  
**MECHANICS & PROPERTIES OF MATTER**

**Course Outcomes**

**CO1:** Describe the physical significance of gradient of scalar field, divergence and curl of vector field. Applications of Gauss's & Green's theorems. (K2)

**CO2:** Describe the working of multi stage rockets, collisions in 2D & 3D. concept of Rutherford's scattering experiment and its importance. (K2)

**CO3:** Apply Euler equations and Analyse of precessional velocity of symmetric top. (K3)(K4)

**CO4:** Demonstrate central force with examples. Verification of Kepler's laws, application to Planetary system. (K3)

**CO5:** Deduce the concepts of relativity, frame of reference, Lorentz transformations, length contraction and time dilation. (K4)

**WAVES & OSCILLATIONS**

**Course Outcomes**

**CO1:** Analysing the simple Harmonic Motion, characteristics. Determination of acceleration due to gravity 'g' by Compound pendulum & rigidity modulus by Torsion pendulum. (K5)

**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. (K4)

**CO3:** Analyse the periodic functions like square wave, Saw tooth wave by using Fourier's theorem.(K5)

**CO4:** Basic understanding of Ultrasonics, different production methods and applications. (K3)

**PRACTICAL**

**Course Outcomes:**

**CO1:** Determine the acceleration due to gravity(g) and radius of gyration(k) by compound pendulum. (K3)

**CO2:** Determine the moment of Inertia(I) of a regular rectangular body by bifilar pendulum. (K3)

**CO3:** Determine the Rigidity modulus ( $n$ ) of the material of wire by Torsional pendulum.(K3)

**CO4:** Justify the laws of vibration of stretched string - Sonometer. (K5)

**CO5:** Estimate standard errors - simple pendulum. (K4)

**CO6:** Measure the Young's modulus of the material of a bar - Non-Uniform bending. (K5)

**THERMODYNAMICS & WAVE OPTICS**

**Course Outcomes**

**CO1:** Describe the basic concepts of Thermodynamics and the kinetic theory of gases, transport phenomenon.(K2)

**CO2:** Deduce the thermodynamic potentials and deriving the Maxwell's equations, and their application to different thermodynamic systems. (K4)

**CO3:** Explain interference and its applications. (K3)

**CO4:** Demonstrate the concept of aberrations, their importance in camera and other lens systems. (K3) practice

**THERMODYNAMICS & RADIATION PHYSICS**

**Course Outcomes**

**CO1:** Explain the concept of low temperature Physics and its applications. (K3)

**CO2:** Determine different laws and formulae in Quantum theory of radiation and measurement of radiation by using different Pyrometers. (K3)

- CO3:** Explain diffraction and basic understanding of Holography. (K3)  
**CO4:** Demonstrate the polarization and different methods of conversion of unpolarized light into polarized light. Basics of Fiber optics. (K3)

### **PRACTICAL FOR THERMODYNAMICS & RADIATION PHYSICS**

#### **Course Outcomes:**

- CO1:** Determine heating efficiency of electric kettle by varying voltages. (K3)  
**CO2:** Estimate the Temperature, characteristics of Thermister. (K4)  
**CO3:** Determine Plank's Constant. (K3)  
**CO4:** Determine Stefan's constant. (K3)  
**CO5:** Measure Thermal conductivity of a bad conductor by Lee's Methods. (K5)

### **ELECTRICITY, MAGNETISM & ELECTRONICS**

#### **Course Outcomes**

- CO1:** Deduce Gauss's law and its applications of electrostatics & basics of dielectrics.  
**CO2:** Analyse the electric & magnetic fields and understand the Biot savart's law and apply it to long straight wire & solenoid. (K4)  
**CO3:** Define the basic laws of electricity and magnetism, deduce Maxwell equations and analyse the production of electromagnetic waves. (K1)(K4)  
**CO4:** Describe basic concepts of electronics, working of p-n junction diodes and analysis of transistor configurations. (K2)

### **ELECTRICITY, MAGNETISM & ELECTRONICS PRACTICAL**

#### **Course Outcomes:**

- CO1:** Determine the figure of merit of Moving Coil Galvanometer. (K3)  
**CO2:** Measure Q-factor using L-C-R Series resonance.(K5)  
**CO3:** Frequency of AC Sonometer.  
**CO4:** Magnetic field along the axis of a circular coil carrying current.  
**CO5:** Measure the specific resistance of the material of a given wire using Garey Foster's Bridge. (K5).  
**CO6:** Justify Kirchoff's Laws. (K4)

### **MODERN PHYSICS**

#### **Course Outcomes**

- CO1:** Describe evolution of atomic models spectra of different elements, the effect of electric and magnetic field on the spectra. (K2)  
**CO2:** Describe properties of the nucleus and the models associated with it. (K2)  
**CO3:** Explain the theories behind the alpha and beta decays. Different detectors used to detect alpha, beta & gamma radiations. (K3)  
**CO4:** Describe the crystal structure and also experimental study of it. (K2)  
**CO5:** Explain the basic theories of superconductivity. (K3)

### **MODERN PHYSICS LAB**

#### **Course Outcomes:**

- CO1:** Determination of specific charge  $e/m$  of an electron – Thomson method.  
**CO2:** Determination of Plank's Constant by using Photo voltaic cell.  
**CO3:** Determination of M and H by using deflection magneto meter and vibration magnetometer  
**CO4:** Energy gap of semiconductor by using junction diode.  
**CO5:** Verification of De'Morgans theorem.  
**CO6:** Determination of Mutual Inductance by using ballistic Galvanometer.

## **RENEWABLE ENERGY**

### **Course Outcomes**

**CO1:** Demonstrate different forms of energy resources and its role in economic development. (K3)

**CO2:** Describe the effects of environmental degradation, global warming, nuclear power generation. (K2)

**CO3:** Correlate Solar, Wind, Ocean, Hydrogen energy conversions. (K4)

**CO4:** Analyse the conversion of bio mass into fuels, biomass plants types and design. (K4)

### **RENEWABLE ENERGY PRACTICAL**

#### **Course Outcomes:**

**CO1:** Measure V-I characteristics of Solar cell. (K5)

**CO2:** Illustrate the effect of input light intensity of the performance of solar cell. (K4)

**CO3:** Determine the constant of Ballistic Galvonameter by standard condenser method. (K3)

**CO4:** Measure resonance frequency of Phase Shift Oscillator. (K5)

**CO5:** Illustrate characteristics of Wind. (K4)

**CO6:** Evaluate the performance of Solar cooker. (K5)

### **SOLAR THERMAL AND PHOTOVOLTAIC ASPECTS**

#### **Course Outcomes**

**CO1:** Explain basics of solar radiations and solar intensity measurements. (K2)

**CO2:** Classify design and performance parameters of concentrating collectors. (K4)(K6)

**CO3:** Analyze the fabrication of different types of solar cells. (K5)

### **SOLAR THERMAL & PHOTOVOLTAIC ASPECTS – PRACTICAL**

#### **Course Outcomes:**

**CO1:** Measure Solar constant using Angstrom Pyrheliometer. (K5)

**CO2:** Measure Tilt angle using Solar Photo voltaic panel. (K5)

**CO3:** Determine Voltage & Current Solar Photo Voltaic panel in series. (K3)

**CO4:** Determine Voltage & current Solar Photo Voltaic panel in Parallel. (K3)

### **WIND, HYDRO & OCEAN ENERGIES**

#### **Course Outcomes**

**CO1:** Describe wind generation, meteorology of wind and classify wind energy convertors. (K2)(K4)

**CO2:** Demonstrate construction and working of wind turbine and its characteristics. (K3)

**CO3:** Classify the technology process of Ocean, thermal and tidal energy conversion. (K4)

### **WIND HYDRO & OCEAN ENERGIES**

#### **Course Outcomes:**

**CO1:** Estimate wind speed using anemometer. (K4)

**CO2:** Determine the characteristics of wind generator turbine. (K3)

**CO3:** Evaluate performance of vertical and horizontal axis wind turbine. (K5)

**CO4:** Estimate electric power output using Wind turbine. (K4)

### **ENERGY STORAGE DEVICES**

#### **Course Outcomes**

**CO1:** Analyse different modes of energy storage. (K4)

**CO2:** Analyse different types of electro chemical energy storage systems. (K4)

**CO3:** Demonstrate fuel cell components, principle and it's working. (K3)

**CO4:** Classify different types of fuel cells and the problems with fuel cells and their applications. (K4)

### **ENERGY STORAGE DEVICES – PRACTICAL**

#### **Course Outcomes:**

- 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 photovoltaic cell. (K4)  
**CO4:** Evaluate the performance of Solar cooker. (K5)

### **WAVE OPTICS I**

#### **Course Outcomes:**

- CO1:** Determine the radius of curvature of a given convex lens - Newton's Rings. (K3)  
**CO2:** Estimate power of a prism. (K4)  
**CO3:** Determine wave length of light using diffraction grating - Minimum deviation method. (K3)  
**CO4:** Estimate the resolving power of a telescope. (K4)  
**CO5:** Determine the refractive Index of liquid - Boye's method. (K3)  
**CO6:** Determine the refractive Index of the material of a convex lens. (K3)

### **WAVE OPTICS II**

#### **Course Outcomes:**

- CO1:** Determine refractive Index of liquid - Boye's method. (K3)  
**CO2:** Determine the Resolving power of a telescope. (K3)  
**CO3:** Determine the wave length of light using diffraction grating - Minimum deviation method. (K3)  
**CO4:** Determine radius of curvature of a given convex lens - Newton's Rings. (K3) **CO5:** Determine the spherical and Chromatic aberrations produced by a thick lens. (K4) **CO6:** Determine Dispersive power of prism by using spectrometer. (K3)