

## Program Outcomes

1. **PO-1: Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialisation to the solution of complex engineering problems.
2. **PO-2: Problem analysis:** Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **PO-3: Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **PO-4: Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **PO-5: Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. **PO-6: The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **PO-7: Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of need for sustainable development.
8. **PO-8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **PO-9: Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **PO-10: Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **PO-11: Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **PO-12: Life-long learning:** Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

## Course Outcomes

### Course outcome (Undergraduate Course outcome) for 2021 Scheme

**Course Name: Calculus And Differential Equations**

**Sub. Code:21MAT11**

|             |   |
|-------------|---|
| <b>CO-1</b> | Apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bentness of a curve.                            |
| <b>CO-2</b> | Learn the notion of partial differentiation to calculate rate of change of multivariate functions and solve problems related to composite functions and Jacobian. |
| <b>CO-3</b> | Solve first-order linear/nonlinear ordinary differential equations analytically using standard methods.   |
| <b>CO-4</b> | Demonstrate various models through higher order differential equations and solve such linear ordinary differential equations.                                     |
| <b>CO-5</b> | Test the consistency of a system of linear equations and to solve them by direct and iterative methods.   |

**Course Name: Engineering Physics**

**Sub. Code:21PHY12**

|             |   |
|-------------|---|
| <b>CO-1</b> | Interpret the types of mechanical vibrations and their applications, the role of Shock waves in various fields. |
| <b>CO-2</b> | Demonstrate the quantisation of energy for microscopic system   |
| <b>CO-3</b> | Apply LASER and Optical fibers in opto electronic system.   |
| <b>CO-4</b> | Illustrate merits of quantum free electron theory and applications of Hall effect.                              |
| <b>CO-5</b> | Analyse the importance of XRD and Electron Microscopy in Nano material characterization.                        |

**Course Name: BASIC ELECTRICAL ENGINEERING**

**Sub. Code:21ELE13**

|             |  |
|-------------|--|
| <b>CO-1</b> | Analyse basic DC and AC electric circuits  |
| <b>CO-2</b> | Explain the working principles of transformers and electrical machines.  |
| <b>CO-3</b> | Explain the concepts of electric power transmission and distribution of power.   |
| <b>CO-4</b> | Understand the wiring methods, electricity billing, and working principles of circuit protective devices and personal safety measures. |

**Course Name: ELEMENTS OF CIVIL ENGINEERING AND MECHANICS**  
**Sub. Code:21CIV14**

|             |  |
|-------------|--|
| <b>CO-1</b> | Understand the various fields of civil engineering.  |
| <b>CO-2</b> | Compute the resultant of a force system and resolution of a force.   |
| <b>CO-3</b> | Comprehend the action for forces, moments, and other types of loads on rigid bodies and compute the reactive forces. |
| <b>CO-4</b> | Locate the centroid and compute the moment of inertia of regular and built-up sections.                              |
| <b>CO-5</b> | Analyze the bodies in motion.  |

**Course Name: Engineering Visualization** **Sub. Code:21EV15**

|             |  |
|-------------|--|
| <b>CO-1</b> | Understand and visualize the objects with definite shape and dimensions                                |
| <b>CO-2</b> | Analyze the shape and size of objects through different views  |
| <b>CO-3</b> | Develop the lateral surfaces of the object   |
| <b>CO-4</b> | Create a 3D view using CAD software.   |
| <b>CO-5</b> | Identify the interdisciplinary engineering components or systems through its graphical representation. |

**Course Name: ENGINEERING PHYSICS LABORATORY** **Sub. Code:21PHYL16**

|             |   |
|-------------|---|
| <b>CO-1</b> | Understand the measuring techniques   |
| <b>CO-2</b> | Operate different instruments and be capable to Analyse the experimental results. |
| <b>CO-3</b> | Construct the circuits and their analysis.  |

**Course Name: BASIC ELECTRICAL ENGINEERING LABORATORY**

**Sub. Code:21ELE17**

|             |   |
|-------------|---|
| <b>CO-1</b> | Verify KCL and KVL and maximum power transfer theorem for DC circuits.                                      |
| <b>CO-2</b> | Compare power factors of different types of lamps.  |
| <b>CO-3</b> | Demonstrate the measurement of the impedance of an electrical circuit and power consumed by a 3-phase load. |
| <b>CO-4</b> | Analyze two-way and three-way control of lamps.   |
| <b>CO-5</b> | Explain the effects of open and short circuits in simple circuits.  |
| <b>CO-6</b> | Interpret the suitability of earth resistance measured.   |

**Course Name: Communicative English**

**Sub. Code:21EGH18**

|      |   |
|------|---|
| CO-1 | Understand and apply the Fundamentals of Communication Skills in their communication skills.  |
| CO-2 | Identify the nuances of phonetics, intonation and enhance pronunciation skills.               |
| CO-3 | Understand and apply the Fundamentals of Communication Skills in their communication skills.  |
| CO-4 | To impart basic English grammar and essentials of language skills as per present requirement. |
| CO-5 | Understand and use all types of English vocabulary and language proficiency.                  |
| CO-6 | Adopt the Techniques of Information Transfer through presentation.                            |

**Course Name: INNOVATION and DESIGN THINKING**

**Sub. Code:21IDT19**

|      |   |
|------|---|
| CO-1 | Appreciate various design process procedure                             |
| CO-2 | Generate and develop design ideas through different technique           |
| CO-3 | Identify the significance of reverse Engineering to Understand products |
| CO-4 | Draw technical drawing for design ideas                                 |

**Course Name: ADVANCED CALCULUS AND NUMERICAL METHODS**

**Sub. Code:21MAT21**

|      |   |
|------|---|
| CO-1 | Apply the concept of change of order of integration and change of variables to evaluate multiple integrals and their usage in computing the area and volume.                            |
| CO-2 | Illustrate the applications of multivariate calculus to understand the solenoidal and irrotational vectors and also exhibit the interdependence of line, surface, and volume integrals. |
| CO-3 | Formulate physical problems to partial differential equations and to obtain solutions for standard practical PDE's.   |
| CO-4 | Apply the knowledge of numerical methods in modeling various physical and engineering phenomena.  |
| CO-5 | Solve first-order ordinary differential equations arising in engineering problems.  |

**Course Name: ENGINEERING CHEMISTRY**

**Sub. Code:21CHE22**

|      |   |
|------|---|
| CO-1 | Discuss the electrochemical energy systems such as electrodes and batteries.  |
| CO-2 | Explain the fundamental concepts of corrosion, its control and surface modification methods namely electroplating and electroless plating |
| CO-3 | Enumerate the importance, synthesis and applications of polymers. Understand properties and application of nanomaterials.                 |
| CO-4 | Describe the principles of green chemistry, understand properties and application alternative fuels.                                      |
| CO-5 | Illustrate the fundamental principles of water chemistry, applications of volumetric and analytical instrumentation.                      |

**Course Name: PROBLEM-SOLVING THROUGH PROGRAMMING****Sub. Code:21PSP23**

|      |   |
|------|---|
| CO-1 | Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts.         |
| CO-2 | Apply programming constructs of C language to solve the real world problem  |
| CO-3 | Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting |
| CO-4 | Explore user-defined data structures like structures, unions and pointers in implementing solutions               |
| CO-5 | Design and Develop Solutions to problems using modular programming constructs using functions                     |

**Course Name: BASIC ELECTRONICS & COMMUNICATION ENGINEERING****Sub. Code:21ELN24**

|      |   |
|------|---|
| CO-1 | Describe the concepts of electronic circuits encompassing power supplies, amplifiers and oscillators.   |
| CO-2 | Present the basics of digital logic engineering including data representation, circuits and the microcontroller system with associated sensors and actuators. |
| CO-3 | Discuss the characteristics and technological advances of embedded systems.   |
| CO-4 | Relate to the fundamentals of communication engineering spanning from the frequency spectrum to the various circuits involved including antennas.             |
| CO-5 | Explain the different modes of communications from wired to wireless and the computing involved   |

**Course Name: ELEMENTS OF MECHANICAL ENGINEERING****Sub. Code:21EME25**

|      |   |
|------|---|
| CO-1 | Understand basic concepts of mechanical engineering in the fields of energy and its utilization, materials technology, manufacturing techniques and transmission systems through demonstrations.                                      |
| CO-2 | Understand the application of energy sources in Power generation and utilization, Engineering materials, manufacturing, and machining techniques leading to the latest advancements and transmission systems in day to day activities |
| CO-3 | Apply the skills in developing simple mechanical elements and processes   |

**Course Name: ENGINEERING CHEMISTRY LABORATORY**

**Sub. Code:21CHEL26**

|             |  |
|-------------|--|
| <b>CO-1</b> | Determine the pKa and coefficient of Viscosity of a given organic liquid.  |
| <b>CO-2</b> | Estimate the amount of substance present in the given solution using Potentiometer Conductometric and Colorimetric.        |
| <b>CO-3</b> | Determine the total hardness and chemical oxygen demand in the given solution by volumetric analysis method                |
| <b>CO-4</b> | Estimate the percentage of Nickel, copper and Iron in the given analyte solution by titration method.                      |
| <b>CO-5</b> | Demonstrate flame photometric estimation of sodium & potassium and the synthesis of nanomaterials by Precipitation method. |

**Course Name: COMPUTER PROGRAMMING LABORATORY**

**Sub. Code: 21CPL27**

|             |  |
|-------------|--|
| <b>CO-1</b> | Define the problem statement and identify the need for computer programming                                      |
| <b>CO-2</b> | Make use of C compiler, IDE for programming, identify and correct the syntax and syntactic errors in programming |
| <b>CO-3</b> | Develop algorithm, flowchart and write programs to solve the given problem                                       |
| <b>CO-4</b> | Demonstrate use of functions, recursive functions, arrays, strings, structures and pointers in problem solving.  |
| <b>CO-5</b> | Document the inference and observations made from the implementation.  |

**Course Name: Professional Writing Skills in English**

**Sub. Code: 21EGH28**

|             |  |
|-------------|--|
| <b>CO-1</b> | To understand and identify the Common Errors in Writing and Speaking.                      |
| <b>CO-2</b> | To Achieve better Technical writing and Presentation skills.                               |
| <b>CO-3</b> | To read Technical proposals properly and make them to Write good technical reports.        |
| <b>CO-4</b> | Acquire Employment and Workplace communication skills.                                     |
| <b>CO-5</b> | To learn about Techniques of Information Transfer through presentation in different level. |

**Course Name: Scientific Foundations of Health**

**Sub. Code: 21SFH29**

|             |   |
|-------------|---|
| <b>CO-1</b> | To understand Health and wellness (and its Beliefs)   |
| <b>CO-2</b> | To acquire Good Health & Its balance for positive mindset   |
| <b>CO-3</b> | To inculcate and develop the healthy lifestyle habits for good health.  |
| <b>CO-4</b> | To Create of Healthy and caring relationships to meet the requirements of MNC and LPG world                         |
| <b>CO-5</b> | To adopt the innovative & positive methods to avoid risks from harmful habits in their campus & outside the campus. |
| <b>CO-6</b> | To positively fight against harmful diseases for good health through positive mindset.                              |