

# GROUP A

## Engineering Mathematics-I

### Course Objectives:

1. To know the application of the matrix technique (Linear algebra) to find solutions of system of linear equations arising in many engineering problems.
2. To know and apply the concept partial derivatives and their applications to Maxima/ Minima, series expansion of multi valued functions.
3. To understand Computation of Jacobian of functions of several variables and their applications to engineering problems.

### Course Outcomes:

**After completion of this course, students will be able to**

**CO1:** Apply the matrix technique (Linear algebra) to find solutions of system of linear equations arising in many engineering problems.

**CO2:** Demonstrate the concept partial derivatives and their applications to Maxima/ Minima, series expansion of multi valued functions.

**CO3:** Compute Jacobian of functions of several variables and their applications to engineering problems.

**CO4:** Identify and sketch of curves in various coordinate system.

**CO5:** Evaluate multiple integrals and their applications to area and volume.

## Engineering Chemistry

### Course Objectives:

1. To impart the knowledge of Chemistry in the area of Engineering and Technology.
2. To capable the student to explain the importance of chemistry in various fields of Engineering.
3. To identify the concept of Chemistry to lay the ground work for subsequent studies.

### Course Outcomes:

**It is expected that by the end semester, student will develop the following competencies.**

**CO1:** Students should be able to understand and explain the basic concepts of Water treatment and capable to explain softening processes and water characteristics..

**CO2:** Students should be able to explain analysis, Calorific value of fuel and explain lubricants, its properties and industrial importance.

**CO3:** Students should know the concepts of Electrochemistry and its importance.

**CO4:** Student should be able to understand and explain various instrumental methods of Analysis.

**CO5:** Student should be able to understand and explain properties and uses of engineering materials such as Cement, Gypsum plaster, Rubber etc.

## **Engineering Mechanics**

### **Course Objectives:**

1. To understand the resolving forces and moments for a given force system.
2. To know and apply Conditions of static equilibrium to analyze given force system.
3. To compute Centre of gravity and Moment of Inertia of plane surfaces.
4. To compute the motion characteristics of a body/particle for a Rectilinear Motion.
5. To know and discuss relation between force and motion characteristics.

### **Course Outcomes:**

#### **Students with be able to:**

**CO1:** Apply fundamental Laws of Engineering Mechanics

**CO2:** Apply Conditions of static equilibrium to analyze given force system

**CO3:** Compute Centre of gravity and Moment of Inertia of plane surfaces

**CO4:** Compute the motion characteristics of a body/particle for a Rectilinear Motion

**CO5:** Know and discuss relation between force and motion characteristics

## **Programming for Problem Solving**

### **Course Objectives:**

1. To develop logical skills and programming skills to solve basic and advanced computing problems.
2. To learn the c-programming language concepts for problem solving

### **Course Outcomes:**

#### **After completion of this course, students will be able to:**

**CO1:** Gain a broad perspective about the uses of computers in engineering industry and C Programming.

**CO2:** Understand the use of Types, operators and expressions in programming.

**CO3:** Apply the knowledge of flow statements and functions for control based computational algorithms.

**CO4:** Understand the concepts of arrays and pointers in C.

**CO5:** Apply the knowledge of structure in OS file management.

## **Workshop Practices**

### **Course Objectives:**

1. To impart knowledge and skills to use tools, machines, equipment and measuring instruments
2. To develop general machining skills

3. To educate about safe handling of machines and tools
4. To develop a skill in dignity of labour, precision, safety at workplace, team working and development of right attitude.

**Course Outcomes:**

**CO1:** Prepare simple wooden joints and parts using wood working tools and machines (Apply)

**CO2:** Apply the fitting and plumbing skills and produce a job with specified dimensions (Apply)

**CO3:** Practice sheet metal tools and machine to develop the sheet metal articles (Apply)

**CO4:** Practice edge preparation for simple Lap, Butt, T joint using Arc/Gas/Resistance welding equipment (Understand)

**CO5:** Demonstrate machining processes including turning, facing, step turning drilling and parting (Understand)

## **Communication Skills**

**Course Objectives:**

1. Groom the students to use correct English
2. Enhance the linguistic abilities with the help of language learning skills LSRW
3. Revision of basic grammar units in English
4. Prepare the students for competitive examinations and the examinations required for higher studies in Indian and foreign universities
5. Ability to develop well-worded communications and resumes
6. Improve listening, note-taking and observational skills

**Course Outcomes:**

**CO1:** Students would be more confident while using English

**CO2:** Engage in analysis of speeches or discourses and several articles

**CO3:** Identify and control anxiety while delivering speech

**CO4:** Write appropriate communications (Academic/Business)

**CO5:** Prepared to take the examinations like GRE/TOFEL/IELTS

**CO6:** Identify and control the tone while speaking

**CO7:** Develop the ability to plan and deliver the well-argued presentations

# GROUP B

## Engineering Mathematics-II

### Course Objectives:

1. To know and discuss the need and use of complex variables to find roots, to separate complex quantities, and to establish a relation between circular and hyperbolic functions.
2. To understand and solve first and higher-order differential equations and apply them as a mathematical modeling in electric and mechanical systems.
3. To determine Fourier series representation of periodic functions over different intervals.
4. To demonstrate the concept of vector differentiation and interpret the physical and geometrical meaning of gradient, divergence & curl in various engineering streams.
5. To know and apply the principles of vector integration to transform line integral to surface integral, surface to volume integral & vice versa using Green's, Stoke's and Gauss divergence theorems.

### Course Outcomes:

**After completion of this course, students will be able to:**

**CO1:** Discuss the need and use of complex variables to find roots, separate complex quantities, and to establish relation between circular and hyperbolic functions.

**CO2:** Solve first and higher order differential equations and apply them as mathematical modeling in electric and mechanical systems.

**CO3:** Determine Fourier series representation of periodic functions over different intervals.

**CO4:** Demonstrate the concept of vector differentiation and interpret the physical and geometrical meaning of gradient, divergence & curl in various engineering streams.

**CO5:** Apply the principles of vector integration to transform line integral to surface integral, surface to volume integral & vice versa using Green's, Stoke's and Gauss divergence theorems.

## Engineering Physics

### Course Objectives:

1. To provide a firm grounding in the basic physics principles and concept to resolve many Engineering and Technological problems.
2. To understand and study the Physics principles behind the developments of engineering materials.

### Course Outcomes:

**After completion of this course, students will be able to:**

**CO1:** Familiar with the principles of acoustic design of a hall and also methods of production of ultrasonic and its applications in various fields and also understand the concept of dielectric and polarization types.

**CO2:** Acquire the basic knowledge of interference, polarization. Students are able to understand the light propagation in fibre and use of Laser in Science and Engineering.

**CO3:** Apply the knowledge of quantum mechanics to set Schrödinger's equations.

**CO4:** Understand key principle and application of nuclear physics. Identify planes in crystal and characteristics measurements of cubic system.

**CO5:** Assimilate wide scope of advanced materials in modern developments and its role in emerging innovating applications.

## **Engineering Graphics**

### **Course Objectives:**

1. To prepare you to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
2. To prepare you to communicate effectively
3. To prepare you to use the techniques, skills, and modern engineering tools necessary for engineering practice.

### **Course Outcomes:**

**CO1:** Understand the basics of engineering graphics and its applications.

**CO2:** Describe the common terms used in design and drawing

**CO3:** Construct the positions of line for given conditions

**CO4:** Visualize the 2D and 3D views of the object

**CO5:** Ability to apply orthographic, sectional, auxiliary and isometric view in engineering drawing

**CO6:** Understand the geometries of development of engineering projects

## **Basic Electrical and Electronics Engineering**

### **Course Objectives:**

1. To equip the students with an understanding of the fundamental principles of DC and AC electrical circuits.
2. To introduce the working principles and applications of fundamental electronic devices and circuits.
3. To identify various measurement instruments and their use in electric and electronic measurements.

### **Course Outcomes:**

**After completion of this course, students will be able to:**

**CO1:** Apply fundamental concepts and circuit laws to solve simple DC and AC circuits

**CO2:** Interpret the construction and working of different types of electrical machines

**CO3:** Analyze building blocks of basic dc power supply.

**CO4:** Outline the principle of BJT as an amplifier.

**CO5:** Apply the knowledge of measuring instruments in electronic instrumentation system.

## **Basic Civil and Mechanical Engineering**

### **Course Objectives:**

1. To identify various Civil Engineering materials and choose suitable material among various options.
2. To know and apply principles of surveying to solve engineering problem
3. To identify various Civil Engineering structural components and select appropriate structural system among various options
4. To Explain and define various properties of basic thermodynamics, materials and manufacturing processes.
5. To know and discuss the working principle of various power consuming and power developing devices.

### **Course Outcomes:**

#### **Students will be able to:**

**CO1:** Identify various Civil Engineering materials and choose suitable material among various options.

**CO2:** Apply principles of surveying to solve engineering problem

**CO3:** Identify various Civil Engineering structural components and select appropriate structural system among various options

**CO4:** Explain and define various properties of basic thermodynamics, materials and manufacturing processes.

**CO5:** Know and discuss the working principle of various power consuming and power developing devices

## **Energy and Environmental Engineering**

### **Course Objectives**

1. To impart the knowledge of Environmental education to the students of Engineering and Technology.
2. To explain basic concepts of sources, causes, effects and control measures of environmental pollution
3. To impart the knowledge of energy sources and power generation
4. To understand the role of individual for the protection of Environment.

## **Course Outcomes**

### **Student should able to:**

**CO1:** Know and understand about components and segments of environment, ecosystem and its types.

**CO2:** Understand power consuming and power developing devices for the effective utilization

**CO3:** Understand and to explain types of Energies such as wind energy, solar energy, hydro energy etc.

**CO4:** Understand and explain various types of air pollution, their effects and control measures.

**CO5:** Know the various types of water pollution, sources, waste water treatment, effect of water pollution on health and soil pollution

## **Design Thinking**

### **Course Objective:**

The objective of this Course is to provide the new ways of creative thinking and Learn the innovation cycle of Design Thinking process for developing innovative products which useful for a student in preparing for an engineering career.

### **Course Outcomes (CO):**

#### **After completion of this course, students will be able to:**

**CO1:** Compare and classify the various learning styles and memory techniques and apply them in their engineering education.

**CO2:** Analyze emotional experience and Inspect emotional expressions to better understand users while designing innovative products.

**CO3:** Develop new ways of creative thinking and learn the innovation cycle of Design Thinking process for developing innovative products.

**CO4:** Propose real-time innovative engineering product designs and Choose appropriate frameworks, strategies, techniques during prototype development.

**CO5:** Perceive individual differences and its impact on everyday decisions and further create a better customer experience.

## **Integrated Personality Development**

### **Course Introduction:** The Need for Values

Students will learn about the need for values as part of their holistic development to become successful in their many roles - as ambitious students, reliable employees, caring family members, and considerate citizens.

### **Course Outcomes:**

#### **After completion of this course, students will be able to:**

1. To provide students with soft skills that complement their hard skills, making them more marketable when entering the workforce.
2. To enhance awareness of India's glory and global values, and to create considerate citizens who strive for the betterment of their family, college, workforce, and nation.
3. To inspire students to strive for a higher sense of character by learning from role models who have lived principled, disciplined, and value-based lives.

## **Health and Wellness**

### **Course Objectives:**

1. To systematically addresses the issues of health, adjustment and well-being.
2. To provide insights from the field of psychology to make your life more satisfying and meaningful.

### **Course Outcomes:**

#### **Students will be able to:**

**CO1:** Learn how to deal with mental distress and disorders.

**CO2:** Understand and enhance positive mental health and wellbeing particularly in the field of psychology.

**CO3:** Gain happiness and well-being theory and research to enrich the understanding of both negative and positive side of human behavior.

## **IKS-Indian Astronomy**

### **Course Objectives:**

1. To provide information about great astronomers who given significant contribution in Indian astronomy.
2. To help students to trace, identify, practice and develop the significant Indian astronomical knowledge.
3. To help to understand the astronomic significance with the human holistic development of physical, mental and spiritual wellbeing.

### **Course Outcomes:**

#### **Students will be able to:**

**CO1:** Understand the fundamentals of spherical co-ordinate system and planetary motion.

**CO2:** Familiar with Vedic and Siddhantic astronomy

**CO3:** Read and understand Indian calendar (Panchanga)

**CO4:** Recognize the fact of Solar eclipse and Lunar Eclipse

**CO5:** Recognize Diurnal problems