DEPARTMENT OF FRESHMEN ENGINEERING

COURSE OUTCOMES (COs)

Course Outcomes (COs) describe what students can able to do after completion of the course.

Program : IB.Tech	Academic Year : 2023-24	Semester : I & II

S.No	Year-Sem	Course Code	Course Name	Course Outcomes After completion of the course student can able to
1	I-I	R231101	COMMUNICATIVE ENGLISH	CO1: Understand the context, topic, and pieces of specific information from social or Transactional dialogues.
				CO2: Apply grammatical structures to formulate sentences and correct word forms.
				CO3: Analyze discourse markers to speak clearly on a specific topic in informal discussions.
				CO4: Evaluate reading / listening texts and to write summaries based on global comprehension of these texts.
				CO5: Create a coherent paragraph, essay, and resume.
2	I-I	R231103	CHEMISTRY	CO1: Compare the materials of construction for battery and electrochemical sensors.
				CO2: Explain the preparation, properties, and applications of thermoplastics & thermosetting & elastomers conducting polymers.
				CO3: Explain the principles of spectrometry, slc in separation of solid and liquid mixtures.
				CO4: Apply the principle of Band diagrams in the application of conductors and semiconductors.
				CO5: Summarize the concepts of Instrumental methods.
3	I-I	R231105		CO1: Develop and use of matrix algebra techniques that are needed by engineers for practical applications.

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			LINEAR ALGEBRA & CALCULUS	CO2: Utilize mean value theorems to real life problems.
				CO3: Familiarize with functions of several variables which is useful in optimization.
				CO4: Learn important tools of calculus in higher dimensions.
				CO5: Familiarize with double and triple integrals of functions of several variables in two dimensions using Cartesian and polar coordinates and in three dimensions using cylindrical and spherical coordinates.
4	I-I	R231106	BASIC CIVIL AND MECHANICAL ENGINEERING	CO1: Understand various sub-divisions of Civil Engineering and to appreciate their role in ensuring better society.
				CO2: Know the concepts of surveying and to understand the measurement of distances, angles and levels through surveying.
				CO3: Realize the importance of Transportation in nation's economy and the engineering measures related to Transportation.
				CO4: Understand the importance of Water Storage and Conveyance Structures so that the social responsibilities of water conservation will be appreciated.
				CO5: Understand the basic characteristics of Civil Engineering Materials and attain knowledge on prefabricated technology.
5	I-I	R231107	INTRODUCTION TO PROGRAMMING	CO1: Understand basics of computers, the concept of algorithm and algorithmic thinking.
				CO2: Analyze a problem and develop an algorithm to solve it.
				CO3: Implement various algorithms using the C programming language.
				CO4: Understand more advanced features of C language.
				CO5: Develop problem-solving skills and the ability to debug and optimize the code.
				CO1: Analyze the intensity variation of light due to polarization, interference and diffraction.
				CO2: Familiarize with the basics of crystals and their structures.

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6	I-I	R231108	ENGINEERING PHYSICS	CO3: Explain fundamentals of quantum mechanics and apply it to one dimensional motion of particles.
				CO4: Summarize various types of polarization of dielectrics and classify the magnetic materials.
				CO5: Explain the basic concepts of Quantum Mechanics and the band theory of solids.
				CO6: Identify the type of semiconductor using Hall effect.
7	I-I	R231105	LINEAR ALGEBRA & CALCULUS	CO1: Develop and use of matrix algebra techniques that are needed by engineers for practical applications.
				CO2: Utilize mean value theorems to real life problems.
				CO3: Familiarize with functions of several variables which is useful in optimization.
				CO4: Learn important tools of calculus in higher dimensions.
				CO5: Familiarize with double and triple integrals of functions of several variables in two dimensions using Cartesian and polar coordinates and in three dimensions using cylindrical and spherical coordinates.
8	I-I	R231109	BASIC ELECTRICAL & ELECTRONICS ENGINEERING	CO1. Describe fundamental laws, operating principles of motors/generators, MC/MI instruments
				CO2. Demonstrate the working of electrical machines, measuring instruments and power generation stations.
				CO3. Apply mathematical tools and fundamental concepts to derive various equations related to electrical circuits and machines.
				CO4. Calculate electrical load and electricity bill of residential and commercial buildings.
9	I-I	R231110	ENGINEERING GRAPHICS	CO1: Understand the principles of engineering drawing, including engineering curves, scales, orthographic and isometric projections.
				CO2: Draw and interpret orthographic projections of points, lines, planes and solids in front, top and side views.
				CO3: Understand and draw projection of solids in various positions in first quadrant.

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				CO4: Explain principles behind development of surfaces.
				CO5: Prepare isometric and perspective sections of simple solids.
10	I-I	R231107	INTRODUCTION TO PROGRAMMING	CO1: Understand basics of computers, the concept of algorithm and algorithmic thinking.
				CO2: Analyze a problem and develop an algorithm to solve it.
				CO3: Implement various algorithms using the C programming language.
				CO4: Understand more advanced features of C language.
				CO5: Develop problem-solving skills and the ability to debug and optimize the code.
11	I-I	R231101L	COMMUNICATIVE ENGLISH LAB	CO1: Understand the different aspects of the English language proficiency with emphasis on LSRW skills.
				CO2: Apply communication skills through various language learning activities.
				CO3: Analyze the English speech sounds, stress, rhythm, intonation and syllable division for better listening and speaking comprehension.
				CO4: Evaluate and exhibit professionalism in participating in debates and group discussions.
				CO5: Create effective Course Objectives:
12	I-I	R231103L	CHEMISTRY LAB	CO1: Determine the cell constant and conductance of solutions.
				CO2: Prepare advanced polymer Bakelite materials.
				CO3: Measure the strength of an acid present in secondary batteries.
				CO4: Analyze the IR spectra of some organic compounds.
				CO5: Calculate strength of acid in Pb-Acid battery.
13	I-I	R231105L	ENGINEERING WORKSHOP	CO1: Identify workshop tools and their operational capabilities.
				CO2: Practice on manufacturing of components using workshop trades including fitting, carpentry, foundry and welding.
				CO3: Apply fitting operations in various applications.
				CO4: Apply basic electrical engineering knowledge for house Wiring Practice

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14	I-I	R231106L	COMPUTER PROGRAMMING LAB	CO1: Read, understand, and trace the execution of programs written in C language.
				CO2: Select the right control structure for solving the problem.
				CO3: Develop C programs which utilize memory efficiently using programming constructs like pointers.
				CO4: Develop, Debug and Execute programs to demonstrate the applications of arrays, functions, basic concepts of pointers in C.
15	I-I	R231107L	HEALTH AND WELLNESS, YOGA AND SPORTS	CO1: Understand the importance of yoga and sports for Physical fitness and sound health.
				CO2: Demonstrate an understanding of health-related fitness components.
				CO3: Compare and contrast various activities that help enhance their health.
				CO4: Assess current personal fitness levels.
				CO5: Develop Positive Personality
16	I-I	R231108	IT WORKSHOP	CO1: Perform Hardware troubleshooting.
				CO2: Understand Hardware components and inter dependencies.
				CO3: Safeguard computer systems from viruses/worms.
				CO4: Document/ Presentation preparation.
				CO5: Perform calculations using spreadsheets.
17	I-I	R231109L	ENGINEERING PHYSICS LAB	CO1: Operate optical instruments like travelling microscope and spectrometer.
				CO2: Estimate the wavelengths of different colors using diffraction grating.
				CO3: Plot the intensity of the magnetic field of circular coil carrying current with distance.
				CO4: Evaluate dielectric constant and magnetic susceptibility for dielectric and magnetic materials respectively.
				CO5: Calculate the band gap of a given semiconductor.
				CO6: Identify the type of semiconductor using Hall effect.
18	I-I	R231110L	ELECTRICAL & ELECTRONICS	CO1. Measure voltage, current and power in an electrical circuit.

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			ENGINEERING WORKSHOP	CO2. Measure of Resistance using Wheat stone bridge
				CO3. Discover critical field resistance and critical speed of DC shunt generators.
				CO4. Investigate the effect of reactive power and power factor in electrical loads.
19	I-I	R231106 L	COMPUTER PROGRAMMIN G LAB	CO1: Read, understand, and trace the execution of programs written in C language.
				CO2: Select the right control structure for solving the problem.
				CO3: Develop C programs which utilize memory efficiently using programming constructs like pointers.
				CO4: Develop, Debug and Execute programs to demonstrate the applications of arrays, functions, basic concepts of pointers in C.
20	I-I	R231111L	NSS/NCC/SCOU TS & GUIDES/COMM UNITY SERVICE	CO1: Understand the importance of discipline, character and service motto.
				CO2: Solve some societal issues by applying acquired knowledge, facts, and techniques.
				CO3: Explore human relationships by analyzing social problems.
				CO4: Determine to extend their help for the fellow beings and downtrodden people.
				CO5: Develop leadership skills and civic responsibilities.
21	I-II	R231201	ENGINEERING PHYSICS	CO1: Analyze the intensity variation of light due to polarization, interference and diffraction.
				CO2: Familiarize with the basics of crystals and their structures.
				CO3: Explain fundamentals of quantum mechanics and apply it to one dimensional motion of particles.
				CO4: Summarize various types of polarization of dielectrics and classify the magnetic materials.
				CO5: Explain the basic concepts of Quantum Mechanics and the band theory of solids.
				CO6: Identify the type of semiconductor using Hall effect.
22	I-II	R231202	DIFFERENTIAL EQUATIONS	CO1: Solve the differential equations related to various engineering fields.

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			AND VECTOR CALCULUS	CO2: Identify solution methods for partial differential equations that model physical processes.
				CO3: Interpret the physical meaning of different operators such as gradient, curl and divergence.
				CO4: Estimate the work done against a field, circulation and flux using vector calculus.
23	I-II	R231203	BASIC ELECTRICAL & ELECTRONICS ENGINEERING	CO1. Describe fundamental laws, operating principles of motors/generators, MC/MI instruments
				CO2. Demonstrate the working of electrical machines, measuring instruments and power generation stations.
				CO3. Apply mathematical tools and fundamental concepts to derive various equations related to electrical circuits and machines.
				CO4. Calculate electrical load and electricity bill of residential and commercial buildings.
24	I-II	R231204	ENGINEERING GRAPHICS	CO1: Understand the principles of engineering drawing, including engineering curves, scales, orthographic and isometric projections.
				CO2: Draw and interpret orthographic projections of points, lines, planes and solids in front, top and side views.
				CO3: Understand and draw projection of solids in various positions in first quadrant.
				CO4: Explain principles behind development of surfaces.
				CO5: Prepare isometric and perspective sections of simple solids.
25	I-II	R231201 L	IT WORKSHOP	CO1: Perform Hardware troubleshooting.
				CO2: Understand Hardware components and inter dependencies.
				CO3: Safeguard computer systems from viruses/worms.
				CO4: Document/ Presentation preparation.
				CO5: Perform calculations using spreadsheets.
26	I-II	R231207	COMMUNICATIVE ENGLISH	CO1: Understand the context, topic, and pieces of specific information from social or Transactional dialogues.

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				CO2: Apply grammatical structures to formulate sentences and correct word forms.
				CO3: Analyze discourse markers to speak clearly on a specific topic in informal discussions.
				CO4: Evaluate reading / listening texts and to write summaries based on global comprehension of these texts.
				CO5: Create a coherent paragraph, essay, and resume.
27	I-II	R231209	CHEMISTRY	CO1: Compare the materials of construction for battery and electrochemical sensors.
				CO2: Explain the preparation, properties, and applications of thermoplastics & thermosetting & elastomers conducting polymers.
				CO3: Explain the principles of spectrometry, slc in separation of solid and liquid mixtures.
				CO4: Apply the principle of Band diagrams in the application of conductors and semiconductors.
				CO5: Summarize the concepts of Instrumental methods.
28	I-II	R231208	ENGINEERING CHEMISTRY	CO1: Demonstrate the corrosion prevention methods and factors affecting corrosion.
				CO2: Explain the preparation, properties, and applications of thermoplastics & thermosetting, elastomers & conducting polymers.
				CO3: Explain calorific values, octane number, refining of petroleum and cracking of oils.
				CO4: Explain the setting and hardening of cement.
				CO5: Summarize the concepts of colloids, micelle and nanomaterials.
29	I-II	R231202	DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS	CO1: Solve the differential equations related to various engineering fields.
				CO2: Identify solution methods for partial differential equations that model physical processes.
				CO3: Interpret the physical meaning of different operators such as gradient, curl and divergence.
				CO4: Estimate the work done against a field, circulation and flux using vector calculus.

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30	I-II	R231211	BASIC CIVIL AND MECHANICAL ENGINEERING	CO1: Understand various sub-divisions of Civil Engineering and to appreciate their role in ensuring better society.
				CO2: Know the concepts of surveying and to understand the measurement of distances, angles and levels through surveying.
				CO3: Realize the importance of Transportation in nation's economy and the engineering measures related to Transportation.
				CO4: Understand the importance of Water Storage and Conveyance Structures so that the social responsibilities of water conservation will be appreciated.
				CO5: Understand the basic characteristics of Civil Engineering Materials and attain knowledge on prefabricated technology.
31	I-II	R231212	ENGINEERING MECHANICS	CO1: Understand the fundamental concepts in mechanics and determine the frictional forces for bodies in contact.
				CO2: Analyze different force systems such as concurrent, coplanar and spatial systems and calculate their resultant forces and moments.
				CO3: Calculate the centroids, center of gravity and moment of inertia of different geometrical shapes.
				CO4: Apply the principles of work-energy and impulse-momentum to solve the problems of rectilinear and curvilinear motion of a particle.
				CO5: Solve the problems involving the translational and rotational motion of rigid bodies.
32	I-II	R231205	DATA STRUCTURES	CO1: Explain the role of linear data structures in organizing and accessing data efficiently in algorithms.
				CO2: Design, implement, and apply linked lists for dynamic data storage, demonstrating understanding of memory allocation.
				CO3: Develop programs using stacks to handle recursive algorithms, manage program states, and solve related problems.
				CO4: Apply queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between deques and priority queues, and

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				apply them appropriately to solve data management challenges.
				CO5: Devise novel solutions to small scale programming challenges involving data structures such as stacks, queues, Trees.
				CO6: Recognize scenarios where hashing is advantageous, and design hash-based solutions for specific problems.
33	I-II	R231202L	ENGINEERING PHYSICS LAB	CO1: Operate optical instruments like travelling microscope and spectrometer.
				CO2: Estimate the wavelengths of different colors using diffraction grating.
				CO3: Plot the intensity of the magnetic field of circular coil carrying current with distance.
				CO4: Evaluate dielectric constant and magnetic susceptibility for dielectric and magnetic materials respectively.
				CO5: Calculate the band gap of a given semiconductor.
				CO6: Identify the type of semiconductor using Hall effect.
34	I-II	R231203L	ELECTRICAL & ELECTRONICS ENGINEERING WORKSHOP	CO1. Measure voltage, current and power in an electrical circuit.
				CO2. Measure of Resistance using Wheat stone bridge
				CO3. Discover critical field resistance and critical speed of DC shunt generators.
				CO4. Investigate the effect of reactive power and power factor in electrical loads.
35	I-II	R231204L	DATA STRUCTURES LAB	CO1: Explain the role of linear data structures in organizing and accessing data efficiently in algorithms.
				CO2: Design, implement, and apply linked lists for dynamic data storage, demonstrating understanding of memory allocation.
				CO3: Develop programs using stacks to handle recursive algorithms, manage program states, and solve related problems.
				CO4: Apply queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between deques and priority queues and

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				apply them appropriately to solve data management challenges.
				CO5: Recognize scenarios where hashing is advantageous, and design hash-based solutions for specific problems.
36	I-II	R231206L	NSS/NCC/SCOUTS & GUIDES/COMMUNITY SERVICE	CO1: Understand the importance of discipline, character and service motto.
				CO2: Solve some societal issues by applying acquired knowledge, facts, and techniques.
				CO3: Explore human relationships by analyzing social problems.
				CO4: Determine to extend their help for the fellow beings and downtrodden people.
				CO5: Develop leadership skills and civic responsibilities.
37	I-II	R231207L	COMMUNICATIVE ENGLISH LAB	CO1: Understand the different aspects of the English language proficiency with emphasis on LSRW skills.
				CO2: Apply communication skills through various language learning activities.
				CO3: Analyze the English speech sounds, stress, rhythm, intonation and syllable division for better listening and speaking comprehension.
				CO4: Evaluate and exhibit professionalism in participating in debates and group discussions.
				CO5: Create effective Course Objectives:
38	I-II	R231209L	CHEMISTRY LAB	CO1: Determine the cell constant and conductance of solutions.
				CO2: Prepare advanced polymer Bakelite materials.
				CO3: Measure the strength of an acid present in secondary batteries.
				CO4: Analyze the IR spectra of some organic compounds.
				CO5: Calculate strength of acid in Pb-Acid battery.
39	I-II	R231208L	ENGINEERING CHEMISTRY LAB	CO1: Determine the cell constant and conductance of solutions.
				CO2: Prepare advanced polymer materials.
				CO3: Determine the physical properties like surface tension, adsorption and viscosity.
				CO4: Estimate the Iron and Calcium in cement.
				CO5: Calculate the hardness of water.

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40	I-II	R231211 L	ENGINEERING WORKSHOP	CO1: Identify workshop tools and their operational capabilities.
				CO2: Practice on manufacturing of components using workshop trades including fitting, carpentry, foundry and welding.
				CO3: Apply fitting operations in various applications.
				CO4: Apply basic electrical engineering knowledge for House Wiring Practice
41	I-II	R231212 L	ENGINEERING MECHANICS & BUILDING PRACTICES LAB	CO1: Evaluate the coefficient of friction between two different surfaces and between the inclined plane and the roller.
				CO2: Verify Law of Parallelogram of forces and Law of Moment using force polygon and bell crank lever.
				CO3: Determine the Centre of gravity different configurations
				CO4: Understand the Quality Testing and Assessment Procedures and principles of Non-Destructive Testing.
				CO5: Exposure to safety practices in the construction industry.
42	I-II	R231215 L	HEALTH AND WELLNESS, YOGA AND SPORTS	CO1: Understand the importance of yoga and sports for Physical fitness and sound health.
				CO2: Demonstrate an understanding of health-related fitness components.
				CO3: Compare and contrast various activities that help enhance their health.
				CO4: Assess current personal fitness levels.
				CO5: Develop Positive Personality

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