Agnel Charities'
Fr. C. Rodrigues Institute of Technology, Vashi
(An Autonomous Institute & Permanently Affiliated to University of Mumbai)

DEPARTMENT OF BASIC SCIENCES AND HUMANITIES

Course Outcomes of First Year Engineering

from the

Academic Year

2024 - 2025

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DEPARTMENT OF BASIC SCIENCES AND HUMANITIES

SEMESTER - I

DEPARTMENT OF BASIC SCIENCES AND HUMANITIES

Subject Code	Subject Name	CO- Statement
BSC101	**ENGINEERING MATHEMATICS-I**	Apply the concept of rank of a matrix to find the solution of homogeneous and nonhomogeneous system of equations by analysing their consistency.
		Analyse the characteristic equation to determine the Eigen value, Eigen vector, also function of a matrix by applying Cayley-Hamilton theorem
		Implement the fundamentals of partial differentiation to evaluate the maxima and minima of functions of several variables
		Apply the concepts of Gradient, Divergence, and Curl in order to analyse and state the two types of fields, Irrotational and Solenoidal
BSC102	**ENGINEERING PHYSICS-I**	Apply the fundamental knowledge of optical phenomena to analyse the relevant basic engineering problems and draw the conclusions.
		Use the fundamental knowledge of semiconductor physics to identify the various parameters to solve the problem.
		Apply the knowledge of Laser, fiber optics for health and safety issues by analysing their properties and parameters
		Identify the role and impact of the semiconductor devices and superconductors for sustainable development by knowing their applications.
BSC103	**ENGINEERING CHEMISTRY- I**	Apply the laws of electrochemistry and thermodynamics for solving engineering problems.
		Analyse the quality of water and challenges in non-conventional energy sources for solving the real-world problems.
		Identify the suitable chemical product or material for the protection of environment and public health.
		Interpret the impact of modern chemical industrial practices and energy sources for sustainable development.
ESC101	**ENGINEERING MECHANICS**	Apply the concepts of resolution and composition of forces to find the Resultant and static equilibrium to find reactive forces with and without friction
		Analyse the motion of a particle using kinematic equations.
		Analyse the General plane motion of a rigid body using the concepts of Instantaneous Center of Rotation to find velocity and acceleration for a link Mechanism.
		Analyze the motion of a Particle using Kinetic equations.
		Apply the concept of Centroid to locate it for a plane lamina

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ESC102	**BASIC ELECTRICAL ENGINEERING**	Apply fundamental engineering concept to interpret Basic Electrical Systems, Residential Electrical System and Residential Energy Metering.
		Apply concepts of electrical engineering to solve problems on DC circuits and AC circuits
		Interpret and identify safety devices for professional engineering practice
		Conduct case study on residential lighting and present it to demonstrate effective communication and problem solving.
		Identify electrical motors based on requirement of application and characteristics of motor.
BSCLC101	**ENGINEERING PHYSICS-I LABORATORY**	Apply the fundamental knowledge of optical phenomena, optical fibre and semiconductor devices to determine various parameters through relevant experiments
		Use fundamental knowledge of physics for the effective preparation and execution of the chosen project as a team.
		Apply the technical information required for the project to present proposed project work, write effective reports, and communicate effectively
BSCLC102	**ENGINEERING CHEMISTRY - I LABORATORY**	Apply the laws of electrochemistry and thermodynamics for performing the practicals.
		Apply the laws of electrochemistry and thermodynamics for performing the practicals.
		Analyse the quality of water for assessing the public health
		Demonstrate an ability to work effectively in a team for project based activity.
ESCLC101	**ENGINEERING MECHANICS LABORATORY**	Learner will be able to Demonstrate the Equilibrium of Coplanar Force System.
		Learner will be able to demonstrate law of moments.
		Learner will be able to determine coefficient of friction between two different surfaces in contact.
		Learner will be able to analyse motion of a particle.
ESCLC102	**BASIC ELECTRICAL ENGINEERING LABORATORY**	Assemble the DC and AC circuits on breadboard and test the continuity.
		Select the meters to measure the required variables and analyse the performance of DC and AC circuits
		Assemble simple residential electrical wiring incorporating safety devices.
		Select motor for household applications and test the transformer

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ESCLC103	**PROGRAMMING LABORATORY-I (C)**	Illustrate the basic terminology used in computer programming concept of data types, variables and operators using C
		Use control structure concepts in C programming.
		Develop functions and use it to solve problems in C using modern tools
		Apply arrays and strings to solve problems in C.
		Demonstrate the use of structures, dynamic memory allocation and pointers in C
SEC101	**BASIC WORKSHOP PRACTICE- I**	Develop the necessary skill required to handle/use different fitting tools.
		Develop skill required for hardware maintenance and installation of operating system
		Identify the network components and perform basic networking and crimping.
		Prepare the edges of jobs and do simple arc welding.
VEC101	**UNIVERSAL HUMAN VALUES**	Analyze the significance of value inputs provided in formal education along with skills and develop a broader perspective about life and education
		Formulate their aspirations and concerns at different levels of living, and the way to fulfil them in a sustainable manner.
		Evaluate their current state of understanding and living, and model a healthy lifestyle
		Examine the issues of home sickness, interactions with seniors on the campus, peer pressure with better understanding and feel grateful towards parents, teachers and others
		Develop more confidence and commitment for value-based living in family, society and nature

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DEPARTMENT OF BASIC SCIENCES AND HUMANITIES

SEMESTER - II

DEPARTMENT OF BASIC SCIENCES AND HUMANITIES

Subject Code	Subject Name	CO- Statement
BSC204	**ENGINEERING MATHEMATICS-II**	Analyse whether the first order Differential equation is exact or Linear and solve it by applying the appropriate method.
		Analyse the procedure to find complementary function and particular integral of higher order differential equation solve it by applying the suitable method.
		Implement the fundamentals of Beta and Gamma Function to evaluate the definite integral.
		Apply the fundamentals of multiple integration to analyse and evaluate the area of a lamina and volume of a solid.
		Apply the concepts of line integral, surface integral and volume integral in order to analyse and evaluate problems using Green's theorem, Stoke's theorem, Gauss divergence theorem
BSC205	**ENGINEERING PHYSICS-II**	Apply the fundamental knowledge of crystals and non-crystalline solids parameters to analyse the relevant basic engineering problems.
		Apply the fundamental knowledge of magnetic and dielectric materials in various technical fields by analyzing their intrinsic behaviours
		Use the basic knowledge of nanomaterials and their characterization techniques to identify their applications in societal issues.
		Apply the basic knowledge of nanomaterials and their characterization techniques to identify their impact and role as a sustainable solution.
BSC206	**ENGINEERING CHEMISTRY- II**	Apply the concepts of engineering chemistry for solving the engineering problems.
		Analyze the quality and properties of engineering materials for solving real world problems.
		Identify the suitable engineering material for the protection of the environment and public health
		Apply the knowledge of e- waste management and biodegradable polymers for the sustainable development.
AEC 201	**PROFESSIONAL COMMUNICATION & ETHICS-I**	Evaluate information they listen to and express their ideas ethically and with greater clarity.
		Present convincingly before an audience using accurate and appropriate lexis and enhanced digital content
		Read and analyze objectively, summarize graphically and paraphrase effectively.
		Communicate effectively and ethically along the various channels of communication within a business organization

		and follow the general code of conduct and professional etiquette of the organization.
		Write a set of effective and easy to understand academic articles and technical instructions and convey the same using global information technology and Netiquette.
		Conduct ably and ethically within the social circles with empathy and confidence, thus exhibiting a well-groomed and balanced personality
ESC203	**BASIC ELECTRONICS ENGINEERING**	Apply the fundamentals of engineering to demonstrate the concepts of semiconductor diodes and analyse its applications
		Apply the fundamentals of engineering to design transistor-based applications such as an amplifier, switch, etc.
		Formulate mathematical models to introduce number system and use logic gates to design circuits for a given expression.
		Recognize the utilisation of measuring devices and its working.
		Apply the fundamentals of engineering to introduce various transducers and sensors to adapt to the current technologies regarding new developments in the relevant fields.
BSCLC203	**ENGINEERING PHYSICS-II LABORATORY**	Apply the fundamental knowledge of different materials to determine various parameters through relevant experiments/simulations.
		Use fundamental knowledge of physics for the effective preparation and execution of the chosen project to draw the result and conclusion as a team
		Apply the knowledge gained from the project to present the project work, write effective reports, and communicate effectively
BSCLC204	**ENGINEERING CHEMISTRY II LABORATORY**	Apply the laws of electrochemistry and spectroscopy for performing the practicals.
		Analyze the materials for engineering applications.
		Synthesize the polymer and use it for societal benefits.
		Demonstrate an ability to work effectively in a team for the project
ESCLC204	**ENGINEERING GRAPHICS LABORATORY**	Apply the basic concepts and standards in accordance with IS conventions
		Apply the basic principles of projections in converting pictorial views into orthographic Views.
		Apply the basic principles of projections in converting orthographic Views into isometric drawing
		Represent the internal features of the objects by providing the sectional views of the object.

		Apply the basic principles of projections to draw the missing views.
ESCLC205	**PROGRAMMING LABORATORY-II (JAVA)**	Install java environment and write a java program using fundamental concepts.
		Apply concepts of classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem.
		Achieve reusability in programming by using concept of Inheritance, Interface and Packages.
		Implement concept of Multithreading, and exceptions to obtain robust and faster programmed solutions to problems.
		Design and develop application using Abstract Window Toolkit, Swings with database connectivity
ESCLC206	**BASIC ELECTRONICS ENGINEERING LABORATORY**	Apply knowledge about the electronic equipment such as oscilloscopes, function generators, multimeter, timers etc. for analog testing, measuring the parameters electronics devices such as diode, Zener diode, Transistor etc.
		Demonstrate and analyze the use of basic gates and apply it in various applications in digital domain.
		Analyze sensors/transducers and assemble a prototype for a basic data acquisition system.
		Design analyze, test, and ensure functionality of real-life electronic applications using acquired skills and electronic test instruments.
SEC202	**BASIC WORKSHOP PRACTICE - II**	Develop the necessary skill required to handle/use different carpentry tools.
		Identify different electronic components to design, fabricate and assemble PCB
		Identify different electronic components to design, fabricate and assemble PCB
		Demonstrate the forging operation with the help of a simple job.
IKS201	**INDIAN KNOWLEDGE SYSTEM**	Explore the diverse realms of the Indian Knowledge System, spanning philosophy, literature, and ethics, to appreciate its holistic approach to education.
		Understand foundational concepts in Science and Technology from ancient Indian perspectives, including linguistics, mathematics, and astronomy.
		Discover the rich heritage of Indian Mathematics, Astronomy, and Science, exploring their contributions to global knowledge and technological advancement

		Engage with interdisciplinary perspectives in Humanities and Social Sciences rooted in ancient Indian wisdom, fostering critical thinking and holistic development.
		Apply insights from ancient Indian knowledge systems to contemporary challenges, promoting innovation and sustainable solutions.
		Cultivate a deeper appreciation for Indian heritage while developing analytical skills and interdisciplinary insights for real-world application.