Introduction to Robotics:

This course provides opportunity to learn the mathematical description of robotics (using RoboAnalyzer) to control hardware tools. It aims to impart technical skills into the students for designing solutions to real-world problems by correlating text-book concepts in practice.

Course objective:

1. To provide opportunity to correlate the concept of classroom knowledge into practice.

2. To learn the basic and mathematical concepts of robotics using software (RoboAnalyzer) and hardware tools.

Course Content:

Module I: Introduction to Robotics: History of Robotics, Laws of Robotics, Terminologies and Basic Concepts, Applications of Robots, Current News in Robotics.

Module II: Sensors, Actuators and Circuits in Robotics: Basic Concepts of Sensors, Proprioceptive and Exteroceptive, Sensors commonly used in robotics, Performance Characteristics of Sensors, Basic Concepts of Actuators, Type of actuators, Actuators commonly used in Robotics, Circuits used in Robotics.

Module III: Spatial Descriptions: Frames and Transformations: Coordinate System, Coordinate Transformation, Homogeneous Transformation Matrix, Denavit-Hertenberg Parameters.

Module IV: Kinematics and Dynamics: Forward Kinematics, Inverse Kinematics, Jacobian Matrix, Concepts of Forward and Inverse Dynamics.

Expected outcome:

Skills for understanding, analyzing and solving real-world and industrial problems.

Text Book:

1. Introduction to Robotics. Subir K. Saha. TataMcGraw Hill, 2E.