

Teaching Courses

a) Microcontroller-based System Design

Course Code: DIC-E01T/P (L-T-P:2-0-2) 3 credits

This course aims at:

- Enabling students to enrich their knowledge with hands-on experiments and project-based learning.
- Giving the students a firm understanding of microcontrollers and their application through practice, in an action-oriented setting.
- Introducing the concepts of Robotics, Haptics and their applications to the students.

Course Contents:

- Introduction to Microprocessors, Microcontrollers and Embedded Systems
- Product realization and design
- Embedded System applications, features and case studies
- Introduction to 8-bit microcontrollers (PIC and Atmega)
- Microcontroller architecture and programming in ALP and C
- Introduction to KEIL and Atmel Studio
- Microcontroller I/O programming
- Hardware connections and uploading the HEX file to micro-controllers
- Interfacing of sensors and actuators with micro-controllers
- Design of linear and SMPS power supplies
- Arduino and Raspberry Pi Platforms
- Introduction to Robotics- Fundamentals, Robot Kinematics, Hands on experiments with 6-DOF robot, Robot Kinematics & Position Analysis- DH representation
- Introduction to Haptics
- Design of haptic controllers using micro-controllers
- Design and development of various projects related to home automation and robotics

b) Mechatronics

Course Code: DIC-E03T (L-T-P: 3-0-0) 3 credits

Mechatronics integrates mechanical, electronics, software and control engineering in the design, development and control of diverse systems used in a range of industries including manufacturing, medicine, service industries etc. Examples of Mechatronics systems include aircrafts, dishwashers, motor vehicles, automated manufacturing plants, medical and surgical devices and systems, robots, artificial organs, car anti-lock braking systems (ABS) and many others.

The purpose of this interdisciplinary course is to study the basics of mechatronics systems, to understand the fundamentals of the mechatronics design paradigm, to get familiar with the design and application of advanced hybrid systems (electromechanical systems).

This course aims at:

- Creating a firm base for mechatronics design and development at the basic level.
- Familiarizing students with the fundamentals of design and development of mechatronics systems.
- Reinforcing the knowledge/skills gained, through practice and reflection in an action-oriented setting.

c) Fundamentals of Design

Course Code: DICE02T (L-T-P: 2-0-0) 2 credits

The course is designed to give an introduction of the concept of 'Design' and introduce the various principles employed in the design of products. Through this course, students develop a solid understanding of the fundamental phases and methods in design. Students also learn the stages of the design process and work through each stage to create a design solution to a real-life community problem.

Course objectives:

- Gain an understanding of design and the design process
- Learn how to use key design methods to create meaningful products and services
- Understand interdisciplinary applications of design
- Ignite a spirit of curiosity and problem solving
- Develop skills of visualization and prototyping