

INDUSTRIAL ELECTRICITY (ITE)

ITE 111 BASIC ELECTRONICS (1-5 Hours)

Prerequisite: MATH 111.

An introductory study of laws, theorems, concepts, and principles of electricity and electronics. (F, S)

ITE 112 INTERMEDIATE ELECTRONICS (1-5 Hours)

Prerequisite: ITE 111.

A study of DC/AC current, resistance, magnetism, inductance, capacitance, transformers, etc. (F, S)

ITE 180 Introduction to Robotics (3 Hours)

This course is designed to provide an understanding of the basics of robotics; sensors and actuators; educational robot drive-train mechanisms and motor controls; educational robot designing and building; programming educational robotics modules for autonomous and remote controlled navigation; semester-end group projects (teamwork).

ITE 221 DEVICES AND CIRCUITS I (3 Hours)

Prerequisite: ITE 111 112.

Current flow in doped semiconductors, PN junctions, bipolar junction transistors, and single-staged amplifiers. Emphasis is placed on current control with PN Junction, and on recognition of and characteristic of the three basic amplifier configurations. (F)

ITE 320 Introduction to Robotics Process Automation (3 Hours)

This course is an introduction to the fundamentals of Robotics Process Automation (RPA) and covers basics of software based robotics, programming process automation using Ui Path Studio or similar packages, digitize and automate processes commonly encountered in industrial and business applications. Pre-requisites: Junior or Senior Standing:

ITE 338 DIGITAL LOGIC (3 Hours)

Prerequisite: ITE 111 112.

A study of single source transistor biasing, differential amplifier, diode-resistor gate, flip-flops, logic AND gate of AND & OR gates,, binary number encoders and decoders, R-s, T-D flip flops, ripple counters, programming a ripple counter, etc. (S)

ITE 410 Robotics Systems (3 Hours)

Prerequisite: Junior or Senior Standing.

Designing mobile robotic platforms; Building autonomous and remote-controlled educational robotics systems; Interfacing sensors; Interfacing vision and audio devices; Microcontroller developing boards and programming; Single board computer boards and programming; Robot Operating System (ROS); Object detection – OpenCV and Deep Learning; AI – obstacle navigation, pick and place objects.

ITE 438 PROGRAMMABLE LOGIC CONTROLLER (3 Hours)

Prerequisite: ITE 338 or Instructor's permission.

This course provides practical experience on PLC's through its operation, programming, and uses in the control of production, manufacturing, industrial, and other processes. (F)

ITE 449 NETWORK THEORIES (3 Hours)

Prerequisite: ITE 338.

A study of electric networks and analysis of the behavior of networks in terms of natural modes, or the natural frequencies of response due to arbitrary excitation. (F, S)

ITE 450 ANALOGICAL COMMUNICATION SYSTEMS (3 Hours)

Prerequisite: ITE 221, MATH 221.

Study of complete communications systems selected from broadcast radio, broadcast television, closed circuit television or radar, AM, FM and phase-shift modulation and demodulation techniques. (S)

ITE 465 MICROPROCESSORS & APPLICATION (4 Hours)

Prerequisite: ITE 221, 338.

Logical organization of single-chip microprocessors, their timing and interface requirements. Applications in the control of external devices. (F)

ITE 466 MICROPROCESSOR TROUBLESHOOTING (3 Hours)

Prerequisite: ITE 221, 338.

This course is designed for senior standing students to study professional techniques in microprocessor troubleshooting. Students will learn how to write sample programs for use in troubleshooting, troubleshoot bus, processor, and I/O failures by analyzing signals, and design testable microcomputer. (S)

ITE 475 MICROPROCESSOR SOFTWARE/HARDWARE (3 Hours)

Prerequisite: ITE 221, 338.

This course is designed for senior standing students with an overview of microcomputer systems in software, hardware and interface. Basic microcomputer hardware design at chip level, software programming at the machine language level, and interface to sensors, actuators, and external devices will be introduced. (S)

ITE 476 REAL TIME SYSTEM DESIGN (3 Hours)

Prerequisite: ITE 221, ITE 338, ITE 465, CSC 215.

The topics of this course include the general concepts of real-time systems, design and implementation techniques and specific examples. The instruction is divided into three parts. The first introduces the general concepts of real-time systems, the design and implementation process, with emphasis on the techniques useful for real-time applications. The third part is a detailed examination of specific system organization and their appropriate implementation techniques. (S)