

Instrumentation and Controls Technology

INST 140. Applied Basic D/C Circuits (2+2P) 3 credits

This course is an introduction to electrical fundamentals, energy sources, Ohm's law, power, series, parallel, and series-parallel circuit analysis, Kirchoff's law, Thevenin's theorem, superposition, maximum power transfer, and other theorems. Use of digital multimeters and other electronics instruments will be examined. Semesters offered – fall, spring, summer Co requisite: MATH 096

INST 144. National Electric Code 3 credits

This course is an introduction to the National Electric Code. It offers an explanation of the NEC, how to understand and use the code's technical rules and how to apply the code to electrical installations. The course will focus primarily on information in chapters 1, 2, 3, 4 and 9 of the National Electric Code. Semester offered - fall

INST 145. Applied Basic AC Circuits (2+2P) 3 credits

This course includes the study of alternating current theory to include impedance, capacitive reactance, and inductive reactance in series, parallel, and series-parallel combination as well as resonance and impedance in RLC circuits. Prerequisite: INST 140, Corequisite: MATH 115. Semesters offered–fall, spring and summer.

INST 160. Digital Electronics (4+2P) 5 credits

Digital Electronics is an introduction to combinational and sequential logic circuits, and logic gates, Data Bus Control, binary codes, analog to digital and digital to analog converters, multiplexing, adders and comparators. Interpretation of logic diagrams and typical industrial circuits are also examined. Prerequisite: INST 140. Semester offered–spring.

INST 171. Motors and Controls (4+2P) 5 credits

This course offers an introduction to motors and motor controls. Various kinds of AC/DC machines will be investigated, including AC motors and alternators, DC motors and generators, and variable speed AC drives. The principles of operation, motor control, installation, and testing are included.

Prerequisite: INST 145 Semesters offered fall, spring

INST 180. Semiconductor Circuits (4+2P) 5 credits

This course is an introduction to semiconductor devices, theory and operation. Characteristic curves, diodes, zener diodes, bipolar transistors, CE, CC, and CB amplifiers, Class A, B, and C operation, load lines, FET, thyristors and power supplies will be examined. Prerequisite INST 145 Semester offered fall

INST 190. Principles of Industrial Measurement (4+2P)5 credits

This course is an introduction to the basic principles of process measurement, including techniques for the measurement of flow, level, temperature, pressure, and analytical process variables. Typical industrial transmitters, transducers and primary sensing elements are included. Prerequisite INST 140 Semesters offered fall, spring

INST 220. Process Control (4+2P)5 credits

This course is an introduction to automatic process control systems. Study will include valves, positioners and actuators. Cascade, feed forward, feed back, flow control, level control system processes, and PID loops will be examined. Prerequisite INST 190 Semesters offered spring

INST 235. Electromechanical Devices (4+2P)5 credits

This course covers the theory and applications of electromechanical devices and their associated control circuits. Topics include transducers, pneumatics, vacuum, AC and DC motors, stepper motors and servomechanisms. Prerequisite INST 145 Semesters offered fall, spring, summer

INST 271. PLC Applications (4+2P) 5 credits.

This class is an introduction to Programmable Logic Controllers and the basic building blocks of digital control circuits including ladder logic circuits, timers, counters and sequencers in typical applications. The study will include software and hardware applications. Prerequisite INST 160 Semester offered fall

INST 265. Industrial Wiring (1+3P) 4 credits.

This course is designed to develop a student's understanding and skills in the installation and wiring of industrial electrical equipment, in compliance with the National Electric Code. With the combination of hands on wiring practice and theory, the student will be able to perform industrial electrical tasks while complying with electrical safety, codes, and standards. Prerequisite INST 171 INST 235 Semester offered spring

INST 284. Print Interpretation 3 credits.

This course covers industrial prints and schematics as used in the industry. The prints covered will be; electrical ladder diagrams, piping and instrumentation diagrams (P&IDs), electrical one line, instrument loop diagrams, process flow diagrams (PFD), and ANSI Y32.10 Graphic Symbol as used in hydraulics systems. This course will also cover the fundamental understanding of pumps, fans, and compressors. Prerequisites INST 190, INST 235 Semester Offered – Spring.