Industrial Automation Engineering Technology (IAET)

Courses

IAET 2000 Fundamentals of Measurement and Control: 2 semester hours.
Fundamentals of measurement with an introduction to process control through the study of control devices, process variables, instrument calibration, test equipment, and diagrams. PREREQ: ESET 1100 and ESET 1101. COREQ: IAET 2000L. F, S, D

IAET 2000L Fundamentals of Measurement and Control Laboratory: 1 semester hour.
A laboratory introduction to the application and use of process measurement and control devices, test equipment, and device calibration. PREREQ: ESET 1100L and ESET 1101L. COREQ: IAET 2000. F, S, D

IAET 2050 Introduction to Automation: 3 semester hours.
Fundamentals of logic and digital control systems with an emphasis on programmable logic controller applications. Introduction to power electronics and other circuits necessary for industrial automation. PREREQ: ESET 1100, ESET1101, and ESET 1140. COREQ: IAET 2050L. F, S, D

IAET 2050L Introduction to Automation Laboratory: 4 semester hours.
A laboratory introduction to logic, digital control systems, programmable logic controllers, and circuits necessary for industrial automation. PREREQ: ESET 1100L and ESET 1101L. COREQ: IAET 2050. F, S, D

IAET 2100 Motor Control Theory: 4 semester hours.
Fundamentals of single-phase AC, three-phase AC, and DC motors. The theory of motor control devices including relays, motor starters, soft starters, variable frequency drives (VFDs), switchgear, and motor control centers (MCCs). PREREQ: IAET 2000, IAET 2050, and ESET 1181. COREQ: IAET 2100L. F, S, D

IAET 2100L Motor Control Laboratory: 2 semester hours.
Application of IAET 2100. Wiring, troubleshooting, and design of motor control circuits. Installation and configuration of motor starters, soft starters, variable frequency drives (VFDs), and motor control centers (MCCs). Operation of switchgear. PREREQ: IAET 2000L and IAET 2050L. COREQ: IAET 2100L F, S, D

IAET 3000 PLC Programming Theory: 2 semester hours.
The theory of programmable logic controllers (PLCs) and automation controllers (PACs) program design. Emphasis on ladder logic with an introduction to other programming languages. Industrial communication protocols. Introduction to human-machine interfaces (HMIs). PREREQ: IAET 2000, IAET 2050 and ESET 1181. PRE-or-COREQ: IAET 2100. COREQ: IAET 3000L F, S, D

IAET 3000L PLC Programming Laboratory: 4 semester hours.
Application of IAET 3000. Development and implementation of PLC programs. PLC input/output wiring and troubleshooting. PREREQ: IAET 2000L and IAET 2050L. PRE-or-COREQ: IAET 2100L. COREQ: IAET 3000 F, S, D

IAET 3100 Process Measurement Theory: 3 semester hours.
Fundamentals of fluid mechanics and thermodynamics for process control. Pressure, temperature, level, flow, and analytical measurement devices. Common instrumentation signals. Piping and instrument diagrams (P&IDs). PREREQ: IAET 2100 and IAET 3000. COREQ: IAET 3100L F, S, D

IAET 3100L Process Measurement Laboratory: 2 semester hours.
Application of IAET 3100. Instrument and sensor wiring and troubleshooting. Transmitter calibration and configuration. PREREQ: IAET 2100L and IAET 3000L. COREQ: IAET 3100 F, S, D

IAET 3150 Process Control Theory: 4 semester hours.
Theory of process control with a focus on proportional-integral-derivative (PID) loops applied to pressure, level, temperature, and flow. Heuristic PID tuning methods. Control techniques include feedforward, cascade, split range, ratio, gain scheduling, and final element linearization. Control documentation using piping and instrument diagrams (P&IDs) and functional diagrams. PREREQ: IAET 2100 and IAET 3000. PRE-or-COREQ: IAET 3100. COREQ. IAET 3150L and IAET 3200 F, S, D

IAET 3150L Process Control Laboratory: 3 semester hours.
Application of IAET 3150 and IAET 3200. Programming, configuring, and optimizing controllers for pressure, temperature, level, and flow loops. Process control loop troubleshooting. Industrial network troubleshooting and configuration. PREREQ: IAET 2100L and IAET 3000L. PRE-or-COREQ: IAET3100. COREQ: IAET 3150 and IAET 3200 F, S, D

IAET 3200 Industrial Networking: 2 semester hours.
Applying networking concepts to industrial networks. Application layer protocols, including Ethernet/IP and Modbus TCP. Network troubleshooting techniques. PREREQ: IAET 3000. COREQ: IAET 3150 and IAET 3150L F, S, D