ENGINEERING TECHNOLOGY: SPECIALTY

ETS 1112C, Industrial Electronics Industrial Electronics
6 hrs., 4 crs.,
Prerequisite: EET1035C. The objective of this course is to provide an exposure to many types of industrial electronics. This course will include the study of mechanical, electromechanical, and solid-state devices, thyristors, open- and closed-loop control systems, sensors and transducers, actuators, motors, telemetry, robotics, programmable controllers, and other areas.

ETS 1603, Introduction to Robotics Introduction to Robotics
3 hrs., 3 crs.,
(Offered fall). This course introduces the student to robotics and defines the uses in the computer integrated manufacturing industry. Various topics cover robotic classifications, applications, socioeconomic impact, work-cell design, and the different software packages for programming different manufacturers robots, plus 1/0 and sensor interfacing with class projects centered on a CIM work-cell. This course provides experiences in programming an industrial robot for applications ranging from assembly applications involving the interfacing and control for clamping, parts feeding, index table control, conveyor integration, and fault detection. A host computer will be integrated into the factory lab for just in time and flexible manufacturing for students manufacturing a product. Students gain operating and troubleshooting experience, plus application engineering and systems integration experience on dedicated machinery and assembly robots.

ETS 2511C, Motor and Motion Control Motor and Motion Control
4 hrs., 3 crs.,
(Offered fall). Prerequisite: ETS2542C. This course provides experiences with electro-mechanical devices such as relays, timers, counters, proximity sensors, photo sensors, and solid state relays for control applications. Motors and motor control circuits using motor starters and variable frequency drives (VFDs) controlled by programmable logic controllers (PLCs) are developed for various control applications. Motion control is developed using Allen-Bradley servo drives controlled by AB Control Logix and RSLOGIX 5000 software.

ETS 2535C, Process Control and Instrumentation Process Control and Instrumentation
4 hrs., 3 crs.,
(Offered spring). Prerequisite: ETS2542C. This course prepares the student for working in the area of process control automation. Lecture and lab assignments provide experience with sensors, level control, flow control, pressure control, temperature control, and digital set point and with analog processing, and P.I.D. control. The Allen-Bradley PLC 1500 PLC processors will be used as the process controllers with a process control trainer to design, construct, interface, program, and troubleshoot control circuits and systems. The process software for the course will be the Allen-Bradley RSLOGIX 5/500 and RSVIEW32 Human Machine Interface.

ETS 2542C, Programmable Logic Controllers Programmable Logic Controllers
4 hrs., 3 crs.,
(Offered spring). Prerequisite: EET1084C. This course covers the applications, servicing and troubleshooting of programmable logic controller circuits. The Allen-Bradley PLC processor with RSLOGIX software is applied to control applications involving rung programming, sequencers, timers, counters, data manipulations, instructions, math instructions, file-to-file moves, and communications using A/B Data Highway. Laboratory experiences include the design and troubleshooting of ladder logic programs with interfacing to hydraulics, pneumatics, and electrical sensors such as relays, limit switches, photo sensors, proximity detectors, pressure switches, solenoid valves, and a pneumatic pick-and place robot for industrial purposes.

ETS 2604, Robotics Applications Robotics Applications
1 hr., 1 cr.,
This course is designed to introduce students to the basic principles of robots including classification, operation, maintenance, troubleshooting and applications in the robotics industry. Students use hands-on practices to become familiar with sections of a robotic system in corequisite course ETS2604L.

ETS 2604L, Robotics Applications Lab (Capstone) Robotics Applications Lab (Capstone)
4 hrs., 2 crs.,
$72.00 lab fee. Laboratory work designed to practice and reinforce basic principles of robotics technology learned in the corequisite course, ETS2604 including: classification, operation, maintenance, and troubleshooting in the robotics industry. Students use hands-on practices to become familiar with various sections of a robotic system.

ETS 2606C, Robotics Robotics
4 hrs., 3 crs.,
$72.00 lab fee. (Offered spring). Prerequisite: ETS2542C. Types of robots will be studied, such as servo point-to-point, non-servo pick and place, Cartesian, lead through teach, stepper control, pneumatic PLC control, etc. Robot programming, interfacing, and design of robotic workcells for industrial applications will be developed. A study of robot configurations, programming techniques for applications found in assembly, inspections, welding, painting, and in material handling applications. Lab experiences will be developed with the industrial robot, including a vision system for assembly applications.

ETS 2680C, Mechatronics I Mechatronics I
5 hrs., 3 crs.,
Prerequisite: EET1084C or ETS1520C. Provides the student with an introduction to mechatronics and measurement systems. Topics include microcontroller programming and interfacing, data acquisition, and mechatronics control architectures. Laboratory exercises will consist of experiments with microcontrollers, sensors, actuators, and data acquisition hardware.

ETS 2681C, Mechatronics II Mechatronics II
5 hrs., 3 crs.,
Prerequisite: ETS2680C. This course serves as a way to integrate all other courses in the sequence in a single system. Topics include mechatronics system concepts, safety, machine operation, sensors, pneumatics, electrical systems, and robotics. Laboratory exercises will consist of operating, programming, and problem solving of mechanical, electronic, and software systems on seven mechatronics training stations and one robotics training station.

ETS 2700C, Electro-Hydraulics & Pneumatics Electro-Hydraulics & Pneumatics
4 hrs., 3 crs.,
$29.00 lab fee. (Offered fall). Prerequisite: ETS2542C. This course covers hydraulic and pneumatic applications as found in industrial control applications. Content includes basic physical laws, properties of fluids, hydraulic pumps, circuit design/applications, deceleration/braking of hydraulic actuators, fluid filtration in hydraulic circuits, and troubleshooting This course covers pneumatic applications as found in industrial control systems. Content includes basic physical laws, pressure and force, air compressors, control valves, actuators, sequencing and counterbalance circuits, and troubleshooting.

ETS 2931, Special Projects in Computer Integrated Manufacturing Special Projects in Computer Integrated Manufacturing
2 hrs., 2 crs.,
(Offered fall and spring). Course centering around topics of current interest or of special interest to students or instructors. Students have the opportunity to research, design, and prototype new projects. Topics or focus may vary from semester to semester. The course can be repeated up to two times.