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| **Course Catalog: Industrial Engineering Technology** |
| IE 1103  | 3.0  |
| Introduction to Manufacturing Processes  |
| This course is a study of basic industrial systems which will cover hydraulic, pneumatic, mechanical (bearings, gearing, belt drives, chain and sprockets coupling, clutches and brakes); electrical controls (relay, logic, PLC's and variable frequency drive). The course will also cover measuring equipment, blue print reading, material flow, and equipment up keep. Prerequisite: None  |
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| IE 1112  | 2.0  |
| Industrial Power Systems Lec  |
| A study of hydraulic, and pneumatic industrial power systems. The course will cover all areas of hydraulic and pneumatic systems, parts, troubleshooting and interpreting schematics. Corequisite: [IE 1121](http://www.eastcentral.edu/programs/catalog/index.php?dept=IE#IE1121)  |
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| IE 1121  | 1.0  |
| Industrial Power Systems Lab  |
| A career technical laboratory course on the study of hydraulic, and pneumatic industrial power systems. The course will cover all areas of hydraulic and pneumatic systems, parts, troubleshooting and interpreting schematics. Corequisite: [IE 1112](http://www.eastcentral.edu/programs/catalog/index.php?dept=IE#IE1112).  |
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| IE 1123  | 3.0  |
| Industrial Computer Applications  |
| A software application course to prepare those with a technical interest in the uses of computers in industry. Standard applications such as DOS, Windows Basic, spreadsheet, data base, and word processing for technical objectives will be covered. We will also cover Industrial Data Highway Systems and the uses of digital pictures. Prerequisite: None  |
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| IE 1151  | 1.0  |
| Industrial Electricity Lab  |
| A career technical laboratory on the study of basic industrial electricity. The course introduces and develops the concept necessary for understanding the use of electrical components and circuitry. Prerequisite: None Corequisite: IE\*1152  |
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| IE 1152  | 2.0  |
| Industrial Electricity Lecture  |
| This is an introductory course in basic industrial electricity. This course introduces and develops the concept necessary for understanding the use of electrical components and circuitry. Prerequisite: None Corequisite: IE\*1151  |
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| IE 1163  | 3.0  |
| Indus & Control Sys Wiring  |
| In this course, students work with industrial wiring procedures, standards and regulations. The course introduces the NEC code, JIC standards and manufacture specifications covering industrial wiring. Students will perform panel layout, high and low voltage installation, AC wiring, DC wiring and sensor installation. Conduit, cable tray and wireway installations are also covered in the course. Prerequisite: IE\*1143  |
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| IE 1171  | 1.0  |
| Process & Control Systems Lab  |
| The course teaches the elements of electrical machine control and ladder logic. Students work with machine control components, such as control relays, pilot lights, push buttons, selector switches, timers, counters and sensors. The course ends with an introduction to PLC's. Prerequisite: IE\*1151, IE\*1152; min grade C Corequisite: IE\*1172  |
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| IE 1172  | 2.0  |
| Process & Control Systems Lecture  |
| The course teaches the elements of electrical machine control and ladder logic. Students work with machine control components, such as control relays, pilot lights, push buttons, selector switches, timers, counters and sensors. The course ends with an introduction to PLC's. Prerequisite: IE\*1152, IE\*1151 Corequisite: IE\*1171  |
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| IE 1333  | 3.0  |
| Industrial Robotics  |
| Robotics and programmable automation are an increasing part of industrial production. This course covers the fundamentals of robotics and includes programming using a teach pendant, direct programming, sensing and machine vision. Students will complete three projects of progressing difficulty using Mitsubishi robots. Prerequisite: None  |
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| IE 2113  | 3.0  |
| Maintenance Practices  |
| A study of basic industrial maintenance and repair techniques with emphasis in the mechanical area covering bearing, gearing, gear reducers, belt drives, chain and sprockets, coupling, clutches and brakes, lubrication and variable speed drives. We will also cover areas of preventive maintenance and methods used such as vibration analysis, balancing and infrared testing. Prerequisite: None  |
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| IE 2123  | 3.0  |
| Materials and Metallurgy  |
| Materials and Metallurgy will introduce students to the fundamentals of materials science with a focus on metals and their properties. Alloys, heat treatment and workability of steel, aluminum, magnesium and titanium will be covered. Labs associated with the course will investigate material's ductility and yield as well as showing the effect of heat treatment and surface hardening techniques on metal's properties. Prerequisite: None  |
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| IE 2153  | 3.0  |
| Motor Controls  |
| Controlling AC and DC motors is important in nearly all industries. The Motor Controls course teaches manual motor starters, magnetic contractors, reversing circuits, reduce-voltage starting, accelerating and decelerating methods and troubleshooting. Advanced motor drives are used to expose students to variable speed and torque control. Prerequisite: IE\*1173  |
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| IE 2173  | 3.0  |
| Industrial Systems Troubleshooting  |
| Integrated system troubleshooting procedures are demonstrated. Methods to determine root cause of system malfunction with the use of modern diagnostic equipment are covered. The integrated industrial system is defined as one incorporating mechanical, hydraulic, pneumatic and electrical systems and monitored by a microprocessor-based controller. Prerequisite: [IE 1112](http://www.eastcentral.edu/programs/catalog/index.php?dept=IE#IE1112), [IE 1121](http://www.eastcentral.edu/programs/catalog/index.php?dept=IE#IE1121), [IE 2113](http://www.eastcentral.edu/programs/catalog/index.php?dept=IE#IE2113) [IE 2213](http://www.eastcentral.edu/programs/catalog/index.php?dept=IE#IE2213)  |
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| IE 2213  | 3.0  |
| PLC-Programmable Logic Controllers  |
| Principles of PLC's work and practical information and skills in installing, programming, and troubleshooting. Items covered are memory structure, input/output modules, ladder logic diagrams, and the development of programming skills. Prerequisite: [IE 1173](http://www.eastcentral.edu/programs/catalog/index.php?dept=IE#IE1173)  |
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| IE 2313  | 3.0  |
| Advanced PLC  |
| Advanced programming, installation and troubleshooting techniques on PLC's. Items covered are: networking, sequencer, shift registers, math instructions, data manipulation, program control, counters, timers and latching circuits. HMI programming, installation and troubleshooting is also covered. Prerequisite: [IE 2213](http://www.eastcentral.edu/programs/catalog/index.php?dept=IE#IE2213)  |
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| IE 2403  | 3.0  |
| IE Technology Internship  |
| This course is supervised work experience in the industrial engineering technology field. Students will utilize skills and knowledge obtained from IET courses. A weekly journal entry of the student's learning will be required. The student must complete at least 115 hours of work experience at the internship site over 15 weeks. The student will also be required to complete a journal entry each week. Students desiring to take this course must make their own internship arrangements with a company approved by the IET program (list available) or request that the company of their choosing be approved by the IET program Coordinator. Signing up for this course does not guarantee an internship. Students are responsible for applying for internships at desired companies. PLEASE NOTE: While at the internship site, the student is treated as if actually working for the company. It is imperative to be on time and to follow the rules and policies of the work site. Failure to comply with the rules and policies may be grounds for discontinuing the internship. Prerequisite: 6 IET courses, minimum grade C and an IET major.  |
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| IE 2701-2705  | 1.0-5.0  |
| I.S.-Industrial Engineering  |
| A specialized program of study directly related to the department's area of expertise. The course is arranged between a faculty member and student and takes into consideration the needs, interests and background of the student. Prerequisite: Consent of instructor  |
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| IE 2711-2715  | 1.0-5.0  |
| Special Topics  |
| Courses are offered to accommodate special interests of students and/or faculty. Typically, the course will cover new material not currently contained in the curriculum at ECC. Prerequisite: None  |
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