

# AUTOMATION ENGINEERING TECHNOLOGY (AETC)

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## **AETC 111, ROBOTICS/AUTOMATED MANUFACTURING 3 (5)**

Study of automated manufacturing and the computer-based technologies that are available for this task. Topics covered will include computer aided design (CAD), computer numerical control (CNC), programmable logic controllers (PLC), and computer integrated manufacturing (CIM). Emphasis will be placed on programming of industrial robots for the purpose of automated manufacturing. Laboratory required. (A special fee will be assessed.)

**General Education:** IN1

**Typically Offered:** Fall Semester

## **AETC 121, PROGRAMMABLE LOGIC CONTROLLERS 3 (5)**

Study of programming and application of programmable logic controllers (PLC). Theory and practice of hardware selection, setup, configuration, and troubleshooting. Students will apply their skills towards the programming of PLC hardware for industry related situations. Laboratory required. (A special fee will be assessed.)

**General Education:** IN1

**Typically Offered:** Spring Semester

## **AETC 131, PIPING SYSTEMS AND CODES 3 (4)**

This course is an introduction to specifications, selections, applications, and maintenance of pipes, fittings, and valves. Simple pipe calculations, selection of appropriate tools, types, and purposes of valves, and piping codes will be discussed. Also covered are unique pipe installation and maintenance procedures related to steam heating systems, hydraulic systems, fire protection systems, refrigeration, and air conditioning systems. Laboratory required. (A special fee will be assessed.)

**General Education:** IN1

## **AETC 132, PNEUMATIC COMPONENTS AND SYSTEMS 2 (3)**

This course covers the principles of pneumatics, types of components, and design of typical pneumatic circuits. The history and applications of pneumatics are reviewed. Emphasis is placed on the compression, distribution and use of pneumatics in industry today. Use of various forms of documentation of pneumatic logic circuits is discussed. Laboratory required. (A special fee will be assessed.)

**General Education:** IN1

**Course Entry Requirement(s):** Prerequisite: TECN 121

## **AETC 211, WORKCELL INTERFACING 3 (5)**

This course concentrates on the development of digital communications needed to interface various forms of industrial equipment. Students will use laboratory time to apply the concepts of voltage conversions, isolation techniques, and signal conditioning. Selection and application of available sensor technologies will also be covered. Laboratory required. (A special fee will be assessed.)

**General Education:** IN1

**Course Entry Requirement(s):** Prerequisite: AETC 111, 121 and ELCT 111 or divisional approval.

**Typically Offered:** Fall Semester

## **AETC 221, AUTOMATED SYSTEMS TROUBLESHOOTING 2 (3)**

This course covers the concepts and procedures that are necessary to identify problems, troubleshoot, and repair different configurations of automated work cells. Topics discussed and demonstrated include operation of work cell through the software applications, schematics, control circuits, and problem solving techniques. Laboratory is required. (A special fee will be assessed.)

**General Education:** IN1

**Course Entry Requirement(s):** Prerequisite: TECN 121 and ELCT 111.

## **AETC 222, HYDRAULIC COMPONENTS AND CIRCUITS 2 (3)**

This course covers the principles of operation, construction, and functions of hydraulic components in a closed circuit. Emphasis is placed on skill development in selection of hydraulic components, fluid media and development of hydraulic circuits. Set-up and operation, test and troubleshooting maintenance and repair of hydraulic circuits will be studied. Laboratory required. (A special fee will be assessed.)

**General Education:** IN1

**Course Entry Requirement(s):** Prerequisite: TECN 121

## **AETC 223, PROGRAMMABLE LOGIC CONTROLLERS II 3 (5)**

This course covers advanced programmable logic controller (PLC) concepts. Topics include motion control, PLC related networking, and human machine interfaces (HMI). Laboratory exercises will involve developing systems based upon these topics. Automatic identification, positional sensors, and automation related mechanisms will also be discussed. Laboratory required. (A special fee will be assessed.)

Prerequisite: AETC 121 or divisional approval.

## **AETC 231, FLEXIBLE MANUFACTURING SYSTEMS 3 (6)**

Study of applications of flexible manufacturing. Designed to take the students through the entire process of developing, designing, programming, and documenting a flexible manufacturing system. Project management and team based skills will be emphasized. Laboratory required. (A special fee will be assessed.)

**General Education:** IN1, IN2

**Course Entry Requirement(s):** Prerequisite: AETC 211 or divisional approval

**Typically Offered:** Spring Semester

## **AETC 235, COMPUTER INTEGRATED MANUFACTURING 3 (5)**

Study of the components, equipment, and processes that are related to the concept of computer integrated manufacturing (CIM). This course will focus on the entire spectrum of manufacturing with emphasis on how the components interrelate in a completely automated manufacturing environment. Material handling devices and different methods of automatic identification will also be explored. Laboratory required. (A special fee will be assessed.)

**General Education:** IN1, IN2

**Course Entry Requirement(s):** Prerequisite: AETC 111, 121 or divisional approval.

**Typically Offered:** Fall Semester

**AETC 241, INSTRUMENTATION AND CONTROL 3 (5)**

An application oriented course to include the terminology, symbols, process variables and typical control methods used in process control, measuring techniques of variables, and the methods employed to control these variables. Feedback control methods covered include proportional, integral, derivative, PID, tuning methods, as well as cascade and ratio control. Students install, calibrate, tune, and operate feedback control systems in the laboratory, including flow, temperature, level, and cascade control systems. Laboratory required. (A special fee will be assessed.)

**General Education:** IN1

**Course Entry Requirement(s):** Prerequisite: ELCT 111 or divisional approval.

**Typically Offered:** Spring Semester

**AETC 287, WORK-BASED LEARNING I - AETC 1-3 (1)**

This course provides supervised work experience with approved employer(s) in an area related to the student's program. Emphasis is placed on integrating classroom learning with work experience. Students will be able to evaluate career selection, demonstrate employability skills, and satisfactorily perform work-related competencies. Activities are coordinated and evaluated by college personnel. Course will be graded on S/U basis. Prerequisite: A student must be pursuing an approved program at LCCC; have completed 15 semester hours with a minimum of six semester hours in the discipline of placement; have a minimum GPA of 2.5 in the discipline and a 2.0 overall GPA; and have divisional approval.

**Course Entry Requirement(s):** A student must be pursuing an approved program at LCCC; have completed 15 semester hours with a minimum of six semester hours in the discipline of placement; have a minimum GPA of 2.5 in the discipline and a 2.0 overall GPA; and have divisional approval.

**Typically Offered:** Offer as required

**AETC 299, INDIVIDUALIZED STUDIES IN AUTOMATION TECHNOLOGY 1-2 (1)**

An in-depth study in areas of automation engineering technology presented by discussions and/or individual research and reading. Topics will vary. Repeatable up to a total of four (4) credit hours. Prerequisites: Second-year standing and divisional approval.

**Course Entry Requirement(s):** Prerequisite: Second-year standing and divisional approval.

**Typically Offered:** Offer as required