Course Descriptions for all ELECTROMECHANICAL TECHNOLOGY courses
(in order by semester)

**EMEC 101 Electrical Fundamentals (Cr3) (2:2)**
Provides a foundation of knowledge in electricity. Covers fundamental electrical concepts, EMF, current, resistance, power, AC and DC series and parallel circuit operation and analysis, inductance, capacitance, meter usage, schematics, and circuit component operation. Industrial safety stressed and math applications are reviewed. Practical lab application of concepts.

**EMEC125 Process and Instrumentation Diagrams, P & ID (Cr2) (1:2)**
This course is an introduction to reading, interpreting and developing Process & Instrumentation Drawings (P&ID) also knows as Piping & Instrumentation Diagrams or Process and Control Diagrams. The identification of symbols and function labels commonly found on P & ID, description of how system components are related and tracing process piping ad control loop functions are discussed and practiced.

**EMEC140 Sensors, Wiring & Troubleshooting (Cr1) (0:2)**
This course covers the basic discrete sensors and an introduction to basic analog sensors used in automated manufacturing systems and processes. The student will be exposed to various sensor technologies, and through the use of hands-on labs and exercises, will determine sensor selection, applications, installation, wiring and troubleshooting. The proper use of hand tools and multimeter(s) are incorporated, along with appropriate industry safety standards. Pre- or co-req. EMEC101.

**ENGG 117 Technical Drawings and Specifications (Cr3) (3:0)**
Interpreting and sketching engineering drawings and specifications; multiview projection, dimensioning, sectioning, geometric dimensioning and tolerancing; working drawings, pictorials; introduction to electrical, electronics, tooling, weld, and plastics drawing.

**ENGL101 English I (Cr3) (3:0)**
A writing-intensive course giving close attention to the process of writing through networked workshops and conferences involved in preparation and revision of drafts. The course develops skills in logical and focused writing, through development of a main point by means of supporting ideas and evidence. In addition, students learn to integrate information from secondary sources through the use of summary, paraphrase, and direct quotation in various forms of thesis-based writing. Prereq. - Competence in reading and writing as determined by English Department through testing and/or course work. Approved for the Honors Program.

**MATH140 College Algebra (Cr3) (3:0)**
Concepts of algebra, graphs and functions, exponential and log functions, systems of inequalities and equalities, complex numbers. Prereq. - Appropriate competence as outlined in the Mathematics Placement policy or MATH026 or 028 either with a C or better

**OSAH100 Industry Outreach Safety Education (Cr1) (1:0)**
This course is based upon the 10-hour Occupational Safety and Health Administration's General Industry and Construction Industry Outreach Training Program. The intention is to provide entry level general industry and construction industry workers a broad awareness as it relates to recognizing and preventing hazards within their respective workplaces. The discussion and information cover a variety of safety and health hazards which an employee may encounter in either workplace. This course is intended to be an orientation to the general safety practices along with introductory concepts of
occupational safety and health.

**EMEC105 Introduction to Fluid Power (Cr3) (2:2)**
Description of basic fluid systems and introduction to hydraulic and pneumatic component hardware; work, energy, and power introduced and applied to the fluid power system. Prereq. - Appropriate competence as outlined in the Mathematics Placement Policy or MATH 022.

**EMEC110 Mechanical Components (Cr4) (3:2)**
This course introduces the mechanical components and fasteners used in automated control systems. Discussions and hands-on activities include the use of hand tools, individual mechanical components and mechanical assemblies including: belts, chains, gears, gear drives, bearings, shafts, scales, seals and couplings. Pre- or Coreq. - ENGG 117.

**EMEC130 Introduction to Process Control (CR3) (3:0)**
This course introduces industrial process control and how instrumentation is needed to control the desired outcome. Discussions and online activities include instrumentation loops, instrumentation documents, principles of measurements, basic controller types, advance control, and final elements.

**EMEC135 Electrical Motors and Controls (Cr4) (3:2)**
Concepts of electricity, electronics and controls related to industrial applications; industrial control devices and sensors; relays and electromechanical control; electrical diagrams; transformers and power distribution; solid state power devices; motors, starters and drives; AC/DC motor control; process control fundamentals. Prereq. - EMEC 101.

**ENGL151 English II (Cr3) (3:0)**
Students continue to develop the academic writing and critical reading skills begun in English I. Students may elect to work on introduction to literature (L), report writing (R), or technical writing (T). Prereq.- ENGL 101. Also available through Online Learning. ENGL 151L (literature option) is approved for the Honors Program and has a designated as a Diversity (D) core course.

**CMTH102 Speech Communication (Cr3) (3:0)**
Basic principles of communication theory and practice, including speech preparation and delivery, and the effective use of critical thinking and listening in relation to intrapersonal, interpersonal, intercultural, and group communication.

**EMEC220 Instrumentation I (CR3) (2:3)**
This is the first of two courses that teach process control instrumentation. The course covers temperature and pressure instruments and sensors, basic transmission signals and communications, safety and Safety Instrumented Systems (SIS). Through the use of theory and hands-on practice, students will practice device installation, wiring and troubleshooting using current industrial equipment. Safety and all applicable industry standards are incorporated throughout the course. Prereq. - EMEC125 and 130.

**EMEC240 Industrial Control Systems I (CR4) (3:3)**
This is a first course in industrial control systems that covers programmable logic controllers (PLCs) and programmable automation controllers (PACs) operation, application, programming and troubleshooting. PLC/PAC hardware identification, input/output (I/O), network communications and I/O wiring is
presented. I/O and internal addressing, tags, alias tags and data types are presented and practiced. The basic software instruction set is covered including contacts, coils, timers, counters, data manipulation, comparison and arithmetic. Program control using subroutines and controller organization is also incorporated. Prereq. - EMEC 101; Pre- or Coreq. - ELEC121 or CISC101.

**EMEC251 Mechanical Systems (CR 3) (2:3)**
Operation, diagnostics, repair, and modification of automation with emphasis on advanced mechanical and fluidic systems found in industrial robotics, conveyors, CNC, packaging machinery, casing machinery, and plastics molding equipment. Preventative maintenance and applicable OSHA safety standards. Pre- or Coreq. - EMEC 105, 110, and 135.

**PHYS101 Physics I (Cr4) (3:2)**
This is an introductory, algebra-based, problem-solving physics course with a lab component. Topics covered are one and two-dimensional motion, forces, Newton's laws, work, power, energy, momentum, rotation, equilibrium, fluids, temperature, and heat. Prereq. - MATH140 with C or better. Core: SCI.

**EMEC225 Instrumentation II (CR3) (2:3)**
This is the second of two courses in process control instrumentation. The course covers level and flow measurements and instruments, final elements such as valves, automatic and manual control and instrumentation and control applications. Through the use of theory and hands-on practice, students will practice device installation, wiring and troubleshooting using current industrial equipment. Safety and all applicable industry standards are incorporated throughout the course. Pre- or Coreq. - EMEC220.

**EMEC245 Industrial Control Systems II (Cr3) (2:2)**
Analog control systems, PLC analog control systems including setpoint and PID control operation and programming; networking PLC’s, information exchange, peer to peer, peer to host, host to peer communications; operator interfaces, human machine interface (HMI). Prereq. - EMEC 240. Offered spring semester only.

**EMEC260G Electromechanical Technology Practicum (Cr2) (0:0:8 practicum)**
Actual work shadowing experience in manufacturing or service organizations providing exposure to the maintenance and/or engineering functions involved in modern factory automation design, installation, and servicing; written analysis of equipment problems and maintenance planning. Pre- or Coreq. - completion of all other technical courses in Electromechanical Technology degree program and ENGL 101.

**Elective (Cr3) (3:0)**

**General Education Electives (Cr6)**
From at least two of the following categories: AH, SIT, OR SSB. One course should be D. (see College Catalog)