

# ADVANCED MECHATRONICS ENGINEERING TECHNOLOGY (AMET)

## QUICK FACTS: AMET COURSES

- **Instructional School:** Industry, Engineering, and Trades
- **Department:** Industrial Automation

### AMET 121 DC Circuits and Application

(5 Credits, Fall/Spring)

Aspects and behavior of direct current (DC) electricity as it relates to power, resistance, and energy. Includes the associated DC laws and math to analyze, troubleshoot, and describe the DC circuit operation. Also includes lab activities to enhance the understanding, application, and troubleshooting of DC devices and circuits. PREREQ: Completion of or placement into ENGL 101 or ENGL 101P. COREQ: AMET 131 and AMET 136. PRE/COREQ: Placement into MATH 143P, prior completion of any GEM 3 course, or concurrent enrollment in MATH 118 and MATH 118L. (3 lecture hours, 4 lab hours, 5 credits)

### AMET 131 AC Circuits and Application

(5 Credits, Fall/Spring)

Aspects and behavior of alternating current (AC) electricity as it relates to power, resistance, and energy. Includes the associated AC laws and math to analyze, troubleshoot, and describe the AC circuit operation. Also includes lab activities to enhance the understanding, application, and troubleshooting of AC devices and circuits. PREREQ: Completion of, or placement into, ENGL 101 or ENGL 101P. COREQ: AMET 121 and AMET 136. (3 lecture hours, 4 lab hours, 5 credits)

### AMET 136 Industrial Tools and Fabrication

(3 Credits, Fall/Spring)

Introduction to hand tools, including training on proper tool usage and opportunities for the application of knowledge. Also includes usage of specialized tools such as tap-and-die and extractors, proper wire termination, and the differences in bolts and screws. Workplace safety will be discussed, including best-practice procedures. COREQ: AMET 121 and AMET 131. (1 lecture hours, 4 lab hours, 3 credits)

### AMET 141 Analog Circuits and Application

(5 Credits, Fall/Spring)

Introduction to analog circuits and their application. Includes design, construction, and debugging of analog electronic circuits that utilize devices such as diodes, transistors, and op-amps. Includes lab activities to enhance the understanding and application of analog devices and circuits. PREREQ: AMET 121, AMET 131, and AMET 136. COREQ: AMET 151. (3 lecture hours, 4 lab hours, 5 credits)

### AMET 151 Digital Circuits and Application

(4 Credits, Fall/Spring)

Introduction to digital circuits and their application. Includes basic logics, binary and hexadecimal number systems, Boolean functions and operations, basic logic gates, memory, converters, combinational logic, sequential logic, and troubleshooting digital circuits. Also includes lab activities to enhance the understanding and application of digital devices and circuits. PREREQ: AMET 121, AMET 131, and AMET 136. COREQ: AMET 141. (2 lecture hours, 4 lab hours, 4 credits)

### AMET 196 Fundamentals of Microcontrollers

(3 Credits, Fall/Spring)

Introduction to embedded microcontrollers including aspects of programming and hardware interfacing, integration of external devices, and wireless communications. Includes lab activities to enhance the understanding and application of microcontrollers, devices, and interfacing. PREREQ: AMET 121, AMET 131, and AMET 136. COREQ: AMET 141 and AMET 151. (2 lecture hours, 2 lab hours, 3 credits)

### AMET 201 Programmable Logic Controllers

(5 Credits, Fall/Spring)

Study of programmable logic controllers (PLCs), PLC systems, input/output (I/O) modules, PLC addressing schemes, basic ladder logic programming, and wiring PLC I/O. Includes an analysis of industrial applications such as logic diagrams, switches, and relays. PREREQ: AMET 141, AMET 151, and AMET 196. COREQ: AMET 221, AMET 236, and AMET 241. (2 lecture hours, 6 lab hours, 5 credits)

### AMET 221 Industrial Automated Controls and Instrumentation

(4 Credits, Fall/Spring)

Comprehensive coverage of components, circuits, instruments, and control techniques used in industrial automated systems with a focus on operation. Includes open/closed loops, on/off control, and PID (proportional-integral-derivative) systems. Also includes the fundamentals of pressure, temperature, level, flow, detection; the operation of instruments used to make the associated measurements; and an overview of industrial wireless technologies and industrial networking. PREREQ: AMET 141, AMET 151, and AMET 196. COREQ: AMET 201, AMET 236, and AMET 241. (2 lecture hours, 4 lab hours, 4 credits)

### AMET 231 Industrial Robotics

(5 Credits, Fall/Spring)

Application, operation, programming, and setup of industrial robots using ABB and FANUC robot platforms. Includes lab activities to enhance the understanding and application of robot programming and application. PREREQ: AMET 151, AMET 196, AMET 201, AMET 221, AMET 236, and AMET 241. COREQ: AMET 251 and AMET 290. (3 lecture hours, 4 lab hours, 5 credits)

### AMET 236 Fluid Power Systems

(2 Credits, Fall/Spring)

Basic concepts of fluid power, hydraulic and pneumatic circuit diagrams, components, component symbols, and circuit applications. Includes lab activities to enhance the understanding and application of pneumatic devices and circuits. PREREQ: AMET 141, AMET 151, and AMET 196. COREQ: AMET 201, AMET 221, and AMET 241. (1 lecture hours, 2 lab hours, 2 credits)

### AMET 241 Industrial Communications

(4 Credits, Fall/Spring)

Concepts and practical experience in the setup and maintenance of digital communication networks in an industrial setting. Includes the basics of networking at the physical level using cables, connectors, and digital data modulation; connecting to equipment; network software support such as network protocols and equipment networking setup; and troubleshooting networks. PREREQ: AMET 141, AMET 151, and AMET 196. COREQ: AMET 201, AMET 221, and AMET 236. (2 lecture hours, 4 lab hours, 4 credits)

**AMET 251 Industry Certifications**

(2 Credits, Fall/Spring)

This course will instruct students in writing cover letters and resumes and developing job interviewing skills. It is also a refresher course that will prepare students for the Electronics Technicians Association (ETA) Associate Certified Electronics Technician (CETa) examination and includes training for the OSHA Safety Certification and ETA Customer Service Specialist Certification. Successful attainment of CETa certification is required for graduation from the Advanced Mechatronics program with an AAS degree. PREREQ: AMET 201, AMET 221, AMET 236, and AMET 241. COREQ: AMET 231 and AMET 290, or PERM/INST. (2 lecture hours, 0 lab hours, 2 credits)

**AMET 290 Applied Mechatronics**

(5 Credits, Fall/Spring)

This course covers the fundamental mechanical concepts necessary for the installation, operation, maintenance, and troubleshooting of industrial machinery. Theoretical and hands-on problem-solving activities are emphasized. Topics covered include shafts, couplings, pulleys, belt and chain drives, bearings, and gears. Students will also become familiar with the operation of single-phase, three-phase, and DC industrial motors including braking, starting, adjustable speed drives, drive systems, and motor alignment. Students will perform a wide range of hands-on technical skills in electronic, electrical, fluid power, and mechanical systems. PREREQ: AMET 201, AMET 221, AMET 236, and AMET 241. COREQ: AMET 231 and AMET 251. (2 lecture hours, 6 lab hours, 5 credits)

**AMET 293 Advanced Mechatronics Engineering Technology Internship**

(1-3 Credits, Varies)

Internships allow students to apply learning to real-life career possibilities. Credits are earned through supervised fieldwork specifically related to a student's area of study. PREREQ: PERM/INST. (0 lecture hours, 3 lab hours, 1 credits)

Refer to [How to Read Course Descriptions](#) for an explanation of elements found within the course descriptions above.