MANUFACTURING TECHNOLOGY

The **Manufacturing Technology** program prepares students for entry-level technician positions in the construction, mining, and manufacturing industries.

The program contains two options sharing a common core curriculum. The Electronic Assembly option stresses computer, drafting, electrical, and mechanical skills, while the Manufacturing Processes option stresses application of those skills to computer-aided drafting (CAD), computer-aided manufacturing (CAM), and computer numerically controlled (CNC) machining systems. Training is conducted in a conventional machining laboratory, a state-of-the-art CAM and robotics laboratory, and modern CAD labs. Experienced manufacturing professionals provide the highest quality instruction in a "hands on" environment.

Graduation Requirements

ENGL 1110G Composition I with a C- or higher; placement into college-level math and reading courses or completion of developmental courses with a C- or higher; cumulative GPA of 2.0 or higher. A minimum of 15 of the 60 credits for the associate's degree must be completed at SENMC.

- Manufacturing Technology Electronics Assembly - Associate of Applied Science (https://senmc-public.courseleaf.com/academic-programs/associate-degree-certificate-programs/manufacturing-technology/manufacturing-technology-electronics-assembly-aas/)
- Manufacturing Technology Manufacturing Processes - Associate of Applied Science (https://senmc-public.courseleaf.com/academic-programs/associate-degree-certificate-programs/manufacturing-technology/manufacturing-technology-manufacturing-processes-aas/)

E T 101 Introduction to Engineering Technology and Geomatics 1 Credit (1)
An introduction to geomatics and the various engineering technology disciplines, the engineering approach to problem solving, and the design process. Projects emphasize the importance of teamwork, written & oral communication skills, as well as ethical responsibilities.
View Course Outcomes

E T 104 Soldering Techniques 1 Credit (1)
Fundamentals of soldering, desoldering, and quality inspection of printed circuit boards. (3P)
View Course Outcomes

E T 109 Computer Drafting Fundamentals 3 Credits (3)
Introduction to principles and fundamentals of drafting using both manual drawing techniques and computer-aided drafting (CAD) applications. (3+2P)
Repeatable: up to 3 credits
Crosslist: DRFT 109 and C E 109
View Course Outcomes

E T 110 Introduction to 3-D Modeling (Solid Works) 3 Credits (3)
Introduction to SolidWorks, a 3-D modeling software. The foundation for designing mechanical parts and assemblies. (2+3P)
View Course Outcomes

E T 120 Computation Software 2-3 Credits
The use of spreadsheet software in the field of engineering technology.
View Course Outcomes

E T 125 Introduction to Renewable Energy 3 Credits (3)
Renewable energy systems, including topics in thermal-solar photovoltaic, wind, geothermal systems, and other current topics. Theory, practical applications, safety considerations and the economics of alternative renewable energy systems compared to conventional systems.
View Course Outcomes

E T 143 Civil/Survey Drafting I 3 Credits (3)
Introduction to drafting in the field of Civil Engineering. Drawings, projects, and terminologies related to topographic mapping, contour drawings, plan, and profiles as street/highway layout. (2+2P)
Prerequisite(s): A grade of C- or better in E T 109 or DRFT 109
Repeatable: up to 3 credits
View Course Outcomes

E T 153 Fundamentals of Networking Communications 3 Credits (3)
Introduction to networking basics, including computer hardware and software, electricity, networking terminology, protocols, LANs, WANs, OSI model, IP addressing, and design and documentation of basic network and structure cabling.
View Course Outcomes

E T 154 Construction Methods and Communications 3 Credits (3)
Blueprint reading, specifications, and introduction to materials used in construction.
View Course Outcomes

E T 155 Network Operating Systems I 3 Credits (3)
Introduction to a computer network operating system. (3+1P).
Prerequisite(s): E T 120 or E T 122
View Course Outcomes

E T 156 Introduction to Information Security 2 Credits (2)
This course introduces information security terminology, historical evolution of digital security, types of PC and network system vulnerabilities and types of information loss. In addition, methods of information protection and integrity, intrusion detection, and recovery of data are introduced.
Prerequisite(s)/Corequisite(s): E T 120
View Course Outcomes

E T 160 Windows Fundamentals for IET 3 Credits (3)
Fundamental review of the Windows operating system including installation and upgrades as well as managing applications, files, folders, devices and maintenance.
View Course Outcomes

E T 182 Digital Logic 2 Credits (2)
The use of truth tables, Boolean equations, and diagrams to define, simplify, and implement logic-valued functions. (1+2P).
Prerequisite(s): A grade of C- or better in MATH 1220G or higher
View Course Outcomes

E T 183 Applied DC Circuits 3 Credits (3)
Application of Ohm's law, Kirchhoff's laws, Thevenin's, and Norton's theorems to the analysis of DC passive circuits. Embedded Lab. (2+2P).
Prerequisite(s)/Corequisite(s): MATH 1220G
View Course Outcomes

E T 183L Applied DC Circuits Lab 1 Credit (1)
DC applied circuits lab. (2P).
Corequisite(s): E T 183
View Course Outcomes

E T 184 Applied AC Circuits 1-4 Credits
Application of circuit laws and theorems to analysis of AC passive circuits. Resonant circuit, polyphase circuit and magnetic circuit topics are introduced. Embedded Lab. (2+2P).
Prerequisite(s): A grade of C- or better in ENGR 120
View Course Outcomes

E T 190 Applied Circuits 4 Credits (4)
Application of Ohm's law, Kirchhoff's laws, and Thevenin's theorems to the analysis of AC and DC passive circuits. Electronic circuit topics are introduced. Embedded lab. (3+2P)
Prerequisite(s)/Corequisite(s): A grade of C- or better in MATH 1250G or higher
Repeatable: up to 4 credits
View Course Outcomes

E T 191 Applied Circuits Laboratory 1 Credit (1)
Applied Circuits Lab. (2P)
View Course Outcomes

E T 200 Special Topics 1-6 Credits
Directed study or project.
Repeatable: for a maximum of 6 credits
View Course Outcomes

E T 210 Intermediate 3-D Modeling (Solid Works) 3 Credits (3)
Intermediate 3-D modeling. Applied modeling of techniques to prepare for SolidWorks certification (CSWA).
Prerequisite(s): A grade of C- or better in ENGR 110
View Course Outcomes

E T 217 Manufacturing Processes 3 Credits (3)
Introduction to manufacturing and processing, including: casting, forming, and machining. Emphasis on creating products with the appropriate techniques.
Prerequisite(s): E T 110 and MATH 1220G
Crosslist: I E 217
View Course Outcomes

E T 217L Manufacturing Processes Lab 1 Credit (1)
Hands-on laboratory in machine shop to apply topics from E T 217, including: casting, forming, and machining. (3P)
Corequisite(s): E T 217
View Course Outcomes

E T 220 Internship 1-6 Credits
Internship requiring an approved number of hours of varied and progressive experience in the field of study. The scope and other requirements of the internship are stated in an individualized syllabus and through a memorandum of understanding between the faculty mentor and the industry partner.
Prerequisite(s): E T 283
Repeatable: up to 6 credits
View Course Outcomes

E T 240 Applied Statics 3 Credits (3)
Fundamental topics of applied statics, including force system analysis, equilibrium, free body diagrams, methods of joints and sections, distributed loads, friction, centroids, area moments, and shear and moment diagrams.
Prerequisite(s): PHYS 1230G or PHYS 1310G
Prerequisite(s)/Corequisite(s): MATH 1430G or MATH 1511G
View Course Outcomes

E T 241 Applied Dynamics 3 Credits (3)
The foundation for understanding particles and bodies in motion and the forces involved, including: projectile motion, Newton's Laws of Motion, conservation of energy, and impulse and momentum.
Prerequisite(s): A grade of C- or better in either E T 240 or ENGR 233
Prerequisite(s)/Corequisite(s): (MATH 1440 or MATH 1521G or MATH 1521H)
View Course Outcomes

E T 246 Electronic Devices I 4 Credits (4)
Solid-state devices including diodes, bipolar-transistors, and field effect transistors. Use of these devices in rectifier circuits, small signal and power amplifiers. (3+3P)
Prerequisite(s): A grade of C- or better in one of the following: E T 190 or E T 184 or ENGR 120
View Course Outcomes

E T 253 Networking Operating Systems II 3 Credits (3)
Introduction to a computer network operating system. (3+3P)
Prerequisite(s): E T 120 and E T 153
View Course Outcomes

E T 254 Concrete Technology 3 Credits (3)
Fundamentals of aggregates, Portland cement, and asphalt used in design and construction. (2+2P)
View Course Outcomes

E T 255 Linux System Administration 3 Credits (3)
Operating systems applications and interfacing with an introduction to systems administration. Topics include Shell Programming, Programming Tools, Database Management, System Backups, Security, Setup and Maintenance of Linux Servers.
View Course Outcomes

E T 256 Networking Operating Systems III 3 Credits (3)
Introduction to a computer network operating system. (3+1P)
Prerequisite(s): E T 253
View Course Outcomes

E T 262 Software Technology I 3 Credits (3)
An introduction to computer programming concepts as applied to engineering technology. Includes basic logic design, algorithm development, debugging and documentation. History and use of computers and their impact on society. (2+2P)
Prerequisite(s)/Corequisite(s): (E T 182 or ENGR 130) or (MATH 1250G or MATH 1430G)
View Course Outcomes

E T 272 Electronic Devices II 4 Credits (4)
Operational amplifiers, positive and negative feedback, computer aided circuit analysis. In addition circuits include integrator, differentiators and phase shift networks. (3+3P).
Prerequisite(s): A grade of C- or better in E T 246
Prerequisite(s)/Corequisite(s): MATH 1435 or MATH 1511G
View Course Outcomes

E T 273 Advanced Networking Communications 4 Credits (4)
Explores advanced networking communications to include Wireless Networking, Virtualization and Cloud Computing, Subnets and VLANs, Network Risk Management, Network Security Design, Network Performance, and WANS. The course covers the examination objectives and detailed preparation for students to take the CompTIA Network+ exam. (2+4P)
Prerequisite(s): E T 153
View Course Outcomes

E T 276 Electronic Communications 3 Credits (3)
Antennas, transmission devices, A-M and F-M transmission and
detection, pulse systems, microwave systems. (2+2P)
Prerequisite(s): E T 246
View Course Outcomes

E T 280 Web Design and Multimedia 3 Credits (3)
Introduction to front-end web development including webpage design,
structure, layout, positioning, responsiveness, and foundational layers of
how the web works. Video, audio, and other digital presentation tools are
covered.
View Course Outcomes

E T 282 Digital Electronics 4 Credits (4)
Applications of digital integrated circuits, multiplexers, counters,
arithmetic circuits, and microprocessors. (3+3P).
Prerequisite(s): E T 182
Prerequisite(s)/Corequisite(s): (E T 190 or E T 184)
View Course Outcomes

E T 283 Hardware PC Maintenance 3 Credits (3)
Installing, configuring, troubleshooting, and maintaining personal
computer hardware components. (3+1P)
Prerequisite(s): E T 120
View Course Outcomes

E T 284 Software PC Maintenance 3 Credits (3)
Installing, configuring, troubleshooting, and maintaining personal
computer operating systems. (3+1P)
Prerequisite(s): E T 120
View Course Outcomes

E T 285 Advanced Information Security 3 Credits (3)
The course covers detailed analysis of network security, including
security operations and policy adherence; internal and external
vulnerabilities; methods of identifying, controlling and managing system
access, and the protection of system information.
Prerequisite(s): E T 156
Prerequisite(s)/Corequisite(s): E T 283
View Course Outcomes

E T 286 Information Security Certification Preparation 4 Credits (4)
The course covers the examination objectives and detailed preparation
for a certification in information security.
Prerequisite(s): E T 285
View Course Outcomes

E T 290 Networking Wireless Communication 3 Credits (3)
This course provides an introduction to wireless networking
and communications. Some of the topics covered are protocols,
transmission methods, and IEEE 802.11 standards. Wireless LAN (WLAN)
fundamentals, devices, and security, cellular telephony, broadband, and
satellite communications. (3+1P)
Prerequisite(s): E T 273
View Course Outcomes

E T 291 PC Forensics and Investigation 3 Credits (3)
Introduction to computer forensics and investigative fundamentals.
Topics include understanding computer forensic and investigation
law and requirements, processing crime and incident scenes, and the
extraction, preservation, analysis and presentation of computer-related
evidence.
Prerequisite(s): E T 120 or E T 122
View Course Outcomes