ETME - Engr Tech, Mechanical

ETME 100. Introduction to Mechanical Engineering Technology. 1 Credit. (1 Sem) F
A seminar course surveying the mechanical engineering technology profession.
Topics include an overview of career opportunities, problem solving processes, an
introduction to the basic engineering design process, professionalism, professional
registration, and ethics.

ETME 202. Mechanical Engineering Technology Computer Applications. 1 Credit. (1
Lab) F,S
COREQUISITE: M 166. Computer methodology, and use of various computer
software packages in mechanical engineering technology applications.

ETME 203. Mechanical Design Graphics. 3 Credits. (2 Rec, 1 Lab) F
on demand, S PREREQUISITE: EMEC 103. Course emphasizes the design process as
it pertains to manufactureability, and the role of graphics to communicate design intent
to production. Using 3-D software, design method, G,D,&T, and data management
techniques, students will create drawings that communicate their designs.

ETME 215. Manufacturing Processes. 3 Credits. (3 Lec) F
S; Su on demand PREREQUISITE: EMAT 251 or EMEC 250. Basic methods of
processing materials to change shapes, dimensions, and finishes; special attention to
attendants' forces, temperature, and property changes.

1 Credit. (1 Lab) F,S
PREREQUISITE: MET majors only; non-majors require instructor approval.
COREQUISITE: ETME 215. Hands-on applications of the fundamentals of basic
manufacturing processes.

ETME 217. Manufacturing Process Laboratory - Mechanical Engineering, 1 Credit. (1
Lab) F
S PREREQUISITE: EMAT 252, COREQUISITE: ETME 215. Course will
supplement lecture materials covered in ETME 215. Provides students with hands-on experience
for performing and analyzing a broad spectrum of manufacturing processes
including metal casting, injection molding, powder metallurgy, metal forming, metal
removal, inspection and measurement and welding.

ETME 290R. Undergraduate Research. 1-6 Credits. (1-6 Ind) F,S,Su
PREREQUISITE: Consent of instructor and approval of department head or director.
Directed undergraduate research/creative activity which may culminate in a written work or other creative project. Course will address responsible conduct of research.
May be repeated.

ETME 291. Special Topics, 3 Credits. (1-4 Ind) On Demand
PREREQUISITE: None required but some may be determined necessary by each
offering department. Courses not required in any curriculum for which there is a particular one-time need, or given on a trial basis to determine acceptability and
demand before requesting a regular course number.

ETME 292. Independent Study. 1-3 Credits. (1-3 Ind) F,S
PREREQUISITE: Consent of instructor and approval of department head or director.
Directed research and study on an individual basis.

ETME 303. CAE Tools in Mechanical Design. 3 Credits. (2 Rec, 1 Lab) F
S PREREQUISITE: ETME 203 or equivalent, EGEN 208, EGEN 324.
COREQUISITE: EGEN 331. Emphasizes the use of computer aided engineering tools in
the design process: understanding proper use and interpretation, gaining experience in how to use them through exercises and projects, modeling for analysis, rapid prototyping, and computer aided manufacturing techniques.

ETME 310. Machining and Industrial Safety. 3 Credits. (1 Lec, 2 Lab) F
S; Su on demand PREREQUISITE: ETME 203 or equivalent, or TE 230 for non-
majors, or instructor approval. COREQUISITE: ETME 216. Introduction to modern machining technology and the key principles of industrial safety, material properties
related to machining practices, design, and specifications. Semi-precision and precision
lay-out are covered. An introduction to computer numerically controlled (CNC)
technology and operations is included. Specific hands-on experiences included in
laboratory.

ETME 311. Joining Processes. 3 Credits. (1 Lec, 2 Lab) F
S; Su on demand PREREQUISITE: EMEC 103 or equivalent, or TE 230 for non-
majors, or instructor approval. COREQUISITE: ETME 216. Introduction to modern science of joining technology, as well as a detailed examination of metalurgy
and materials properties as related to joining processes. Welding specification and
symbols are introduced as well as modern welding code usage. Weld design, set-up,
preparation, application, and tests are emphasized. Specific hands-on experiences in
OAW, SMAW, GMAW, GTAW, common separating processes, as well as destructive
and non-destructive testing, are included in laboratory. In addition to commonly
used welding techniques, this course will expose students to other fastening joining
techniques used in industry. Resistance welding, composites, riveting, and mechanical
fastening and their application will be explored.

ETME 321. Applied Heat Transfer. 3 Credits. (3 Lec) F
S; Su on demand PREREQUISITE: EGEN 324 or equivalent. COREQUISITE: EGEN
331 or equivalent. Study of the basic mechanisms of heat transfer and its applications.
Introduction to equipment that utilize these mechanisms.

ETME 340. Mechanisms. 4 Credits. (3 Lec, 1 Lab) S
F; on demand COREQUISITE: EGEN 208, ETME 202. Introduction to
mechanisms and machine elements used in the design and synthesis of mechanical
devices.

ETME 341. Machine Design. 4 Credits. (3 Lec, 1 Lab) F
on demand; S PREREQUISITE: EGEN 208 or equivalent. Application of
mechanisms fundamentals, strength of materials, material selection, and tolerances
and fits to the design of machines and machine systems. Specific hands-on experiences
included in laboratory.

ETME 360. Measurements and Instrumentation Applications. 3 Credits. (2 Lec, 1
Lab) F
S; Su on demand PREREQUISITE: EELE 250, or equivalent. COREQUISITE:
EGEN 350, EGEN 324. Theory and application of engineering technology
measurement concepts including function and operation of transducers; temperature,
pressure, displacement and flow sensing; sensor system calibration; statistical and
uncertainty analysis; sampling theory fundamentals; signal conditioning; 1st order
response; emphasis on applications involving computerized acquisition of data.

ETME 400. Mechanical Engineering Technology Senior Seminar. 1 Credit. (1 Sem) F
PREREQUISITE: Senior standing. A seminar course focusing on career path
development. Students will meet with current industry professionals to discuss specific
careers, as well as meet with freshman students to share undergraduate experiences.
Pass/Fail.

ETME 401. Fundamentals of Engineering Review. 1 Credit. (1 Lec) F,S
A review of engineering fundamentals presented throughout the mechanical
engineering technology curriculum. It serves primarily to prepare students to take
the Fundamentals of Engineering Exam, and subsequently prepare them to progress
towards becoming registered professional engineers.

ETME 410. Computerized Numerical Control and Computer-aided Manufacturing Technology. 3 Credits. (1 Lec, 2 Lab) F,S
PREREQUISITE: ETME 310 or instructor approval. Application and optimization of computer numerical control (CNC) and computer-aided manufacturing (CAM)
technology fundamentals as related to turning, milling, and plasma cutting operations.
Development of toolpaths and machine code (G&M) from associated CAD models is emphasized. Specific hands-on experiences included in laboratory.

ETME 415. Design for Manufacturing and Tooling. 3 Credits. (2 Lec, 1 Lab) F
on demand, S PREREQUISITE: ETME 215; ETME 216 or ETME 217.
COREQUISITE: EGEN 350; ETME 310 for MET majors; or instructor approval.
Overview of production systems and lean manufacturing fundamentals and principles.
Introduction to design for assembly and design for manufacturing principles.
Fundamentals of tool design, including cooling materials, workholding principles, jig
design, fixture design, assembly tool design, design of tools for inspection and gaging,
and tool fabrication techniques. Practical lab experiences will enhance the course
material.

ETME 422. Principles of HVAC I. 3 Credits. (3 Lec) S
F; on demand PREREQUISITE: EMEC 320 or EGEN 324, ETME 321 or EMEC
326, or instructor consent. Refrigeration and heating, ventilating and air-conditioning
(HVAC) for comfort and industrial applications. Psychrometrics, physiological factors
in cooling, HVAC load calculations; modern vapor compression, absorption, low
temperature refrigeration cycles; air distribution and fan-dust analysis, design/selection of HVAC equipment and control systems.
ETME 423. Principles of HVAC II. 3 Credits. (1 Lec, 2 Lab) S
PREREQUISITE: ETME 422 or consent of instructor. Heating, ventilating, and air-conditioning (HVAC) system design/selection as they relate to building performance, energy conservation, and sustainability. Integrated building design, building information modeling and building performance/energy modeling as it applies to various building structures is covered.

ETME 424. Thermal Processes Lab. 1 Credit. (1 Lab) S
F on demand COREQUISITE: ETME 422, ETME 321. Laboratory experiences covering topics in heat transfer, thermodynamics, and HVAC areas in support of ETME 321, EGEN 324, and ETME 422.

ETME 425. Building Systems. 3 Credits. (3 Lec) F
PREREQUISITE: PHSX 207 and junior standing. A survey of the systems and equipment for water supply, sanitation, fire protection, electrical service, heating and air conditioning of buildings.

ETME 430. Fluid Power Systems Design. 3 Credits. (2 Lec, 1 Lab) F
PREREQUISITE: EELE 250; EGEN 331 or EGEN 335; ETME 360 or EMEC 360 and EMEC 361; or consent of instructor. An introduction to the fundamentals and application of fluid power in industry today. Coverage includes: flow and pressure relationships, fluid properties, heat, filtration, selection of components, electro-hydraulic and electro-pneumatic systems, controls, design of hydraulic and pneumatic circuits, and troubleshooting.

ETME 460. Advanced Instrumentation. 3 Credits. (2 Lec, 1 Lab) On Demand
PREREQUISITE: ETME 360 or EMEC 360, EMEC 361; or equivalent, or consent of instructor. An applications-based course in advanced instrumentation and control, focusing on parameter identification; test planning; proper transducer selection, installation, and operation; computerized data acquisition programming and operation; handling and presentation of acquired data. Theory and practice is merged in a project setting.

ETME 462. Industrial Processing. 3 Credits. (2 Lec, 1 Lab) S
PREREQUISITE: ETME 360 or EMEC 360, and EELE 250 The intent of this course is to equip engineering students with the basic understanding of industrial processes, knowledge of the fundamental machines, sensors, and controls used in automated processing, and an understanding of processing system design.

ETME 470. Renewable Energy Applications. 3 Credits. (2 Lec, 1 Lab) F
PREREQUISITE: ETME 360 or EMEC 360, EMEC 361; ETME 340 or EMEC 341; ETME 321 or EMEC 326; or consent of instructor. Experience with energy technologies including wind, solar thermal, solar photovoltaic, fuel cell, biomass, and hydro-electric systems. Lecture covers practical applications, component design, and theory for devices and systems. Social, economic, geo-political, and environmental considerations are discussed. Hands-on lab activities supplemented with site visits.

ETME 489. Capstone: Mechanical Engineering Technology Design I. 2 Credits. (1 Lec, 1 Rct) F
PREREQUISITE: ETME 303, EGEN 310, for MET majors only with senior standing. COREQUISITE: ETME 360, EGEN 325, ETME 310, ETME 311, ETME 340, ETME 341. Senior capstone design experience in Mechanical Engineering Technology. Students, under the guidance of a faculty supervisor, solve real-world design problems.

ETME 490R. Undergraduate Research. 1-6 Credits. (1-6 Ind) F,S,Su
PREREQUISITE: Junior standing, consent of instructor, and approval of certifying officer. Directed undergraduate research/creative activity which may culminate in a research paper, journal article, or undergraduate thesis. Course will address responsible conduct of research. May be repeated.

ETME 491. Special Topics. 1-3 Credits. (1-4 Ind) On Demand
PREREQUISITE: Course prerequisites as determined for each offering. Courses not required in any curriculum for which there is a particular one-time need, or given on a trial basis to determine acceptability and demand before requesting a regular course number.

ETME 492. Independent Study. 1-3 Credits. (1-3 Ind) F,S,Su
PREREQUISITE: Junior standing, consent of instructor, and approval of department head or director. Directed research and study on an individual basis.

ETME 498. Internship. 1-12 Credits. (1-12 Ind) F,S,Su
PREREQUISITE: Junior standing, consent of instructor, and approval of department head. An individualized assignment arranged with an agency, business, or other organization to provide guided experience in the field.

ETME 499R. Capstone: Mechanical Engineering Technology Design II. 3 Credits. (1 Lec, 1 Rct, 1 Lab) F,S
PREREQUISITE: ETME 489, or consent of instructor. For MET majors only. Senior capstone design experience in Mechanical Engineering Technology. Students implement and test the function of design prototypes, under the guidance of a faculty supervisor.