

MECHANICAL ENGINEERING TECH (METC)

METC 102. INTRODUCTION TO ENGINEERING GRAPHICS. 4 Credits.

Notes: graded Pass/Fail.

This course offers an introduction to the fundamentals of technical drawing. It emphasizes the technical methods used to describe the size and shape of objects. This course will not satisfy elective requirements for a major or minor in Technology.

METC 110. ENGINEERING GRAPHICS. 5 Credits.

Notes: two years of high school drafting is highly recommended.

Pre-requisites: METC 102 or permission of instructor.

A study of the technical portion of the graphics language. This language, technical drawing, is used by engineers to communicate proposed designs and new ideas. Includes the theory and practice of descriptive geometry and the graphic representation of data.

METC 340. STATICS. 5 Credits.

Pre-requisites: MATH 142 or MATH 161; PHYS 131 or PHYS 151; all with grades \geq C.

A study of applied mechanics and the principles of statics dealing with forces and with the effects of forces acting upon rigid bodies at rest.

METC 341. STRENGTH OF MATERIALS. 4 Credits.

Pre-requisites: METC 340 or MENG 240, both with grades \geq C.

A study of the relationship that exists between externally applied forces and internally induced stresses in members and parts, including the relationship existing between these same externally applied forces and the resulting deformations. (four hours lecture per week)

METC 342. DYNAMICS. 4 Credits.

Pre-requisites: METC 340 or MENG 240 and MATH 162; all with grades \geq C.

This course is a study of the motion of rigid bodies and forces affecting their motion. Topics include kinematics and kinetic of motion, curvilinear motion, plane motion, work, energy and power, impulse and momentum. (four hours lecture per week)

METC 384. ENERGY MANAGEMENT AND UTILIZATION. 5 Credits.

Pre-requisites: MENG 380 or METC 388, both with grades \geq C.

The study of energy usage and energy management within industrial facilities. The development of Energy audit procedures including the energy saving calculations for industrial settings. Students will develop and explore the creation of industrial energy audits through the extensive use of case studies.

METC 387. FLUID MECHANICS. 5 Credits.

Notes: laboratory work is included.

Pre-requisites: PHYS 132 or PHYS 152; PHYS 162, MATH 162; MENG 300; all with grades \geq C, and a declared Mechanical Engineering Technology major.

This course introduces the student to theory, concepts and applications of fluid mechanics. Topics include static and dynamic forces; conservation of mass, energy and momentum; flow in pipes and ducts; and fan and pump performance.

METC 388. THERMODYNAMICS AND HEAT TRANSFER. 5 Credits.

Pre-requisites: PHYS 132 or PHYS 152; PHYS 162, MATH 162, MENG 300; all with grades \geq C; and a declared Mechanical Engineering Technology major.

This course introduces the student to theory, concepts and applications of thermodynamics and heat transfer. Topics include properties of materials, work, heat, conservation of mass and energy, energy transformation processes, and heat transfer via conduction, convection and radiation.

METC 399. DIRECTED STUDY. 1-5 Credits.

Directed Study.

METC 415. DESIGN OF MACHINE ELEMENTS. 5 Credits.

Pre-requisites: METC 341 or MENG 241; MENG 353, MATH 162; all with grades \geq C, and a declared Mechanical Engineering Technology major.

This course covers the design of machine components and mechanisms and utilizes the concepts of engineering mechanics and strength of materials.

METC 417. ADVANCED PARAMETRIC DESIGN. 5 Credits.

Pre-requisites: MENG 217; MATH 162; METC 341 or MENG 241, all with a grade \geq C; and a declared Mechanical Engineering or Mechanical Engineering Technology major.

Advanced techniques and best practices for parametric design of parts and assemblies. These advanced methodologies include design simulation and analysis including stress analysis, thermal analysis, flow analysis, vibration and motion studies, and design optimization.

METC 456. ENGINEERING ETHICS, CONTRACTS AND PATENTS. 2 Credits.

Pre-requisites: junior standing, ENGL 201 with a \geq C, and a declared Mechanical Engineering or Mechanical Engineering Technology major.

This course investigates the elements of professional engineering practice including their relationship to the law, to the public and the ethics of the profession. Topics covered range from ethics, contracts, patents, copyrights, sales agreements and engineering specifications to professionalism, licensing, intellectual property, liability, risk, reliability and safety.

METC 468. QUALITY ASSURANCE AND INTRO TO LEAN. 5 Credits.

Pre-requisites: PHYS 132 or PHYS 152; PHYS 162; MATH 162; MENG 300; all with grades \geq C; and a declared Mechanical Engineering or Mechanical Engineering Technology major.

Application and theory of quality control and continuous improvement systems. This includes statistical analysis, design of experiments, development and use of process control charts, sampling processes, time and motion studies, and introduction to other Lean tools.

METC 490A. SENIOR CAPSTONE: DESIGN LABORATORY I. 2 Credits.

Pre-requisites: METC 341 or MENG 241; MENG 217, MATH 162, MNTEC 301 and ENGL 201, all with grades \geq C; and senior standing; and a declared Mechanical Engineering Technology major.

Satisfies: a university graduation requirement—senior capstone.

This course simulates the industrial environment, where students work in teams to solve a real world problem from design to implementation. Team dynamics and project constraints are strictly monitored and each student's unique skills are utilized in different stages of the design process.

METC 490B. SENIOR CAPSTONE: DESIGN LABORATORY II. 3 Credits.

Pre-requisites: METC 490A with a grade \geq C. Must be a declared Mechanical Engineering Technology major.

Satisfies: a university graduation requirement—senior capstone. See description for METC 490A.

METC 491. SENIOR PROJECT. 1-10 Credits.

Pre-requisites: senior standing, a declared Mechanical Engineering Technology major and permission of the instructor and chair. Independent and/or group study and implementation of a design and development project. (variable time).

METC 495. INTERNSHIP. 1-5 Credits.

Notes: Graded Pass/Fail. May be repeated for credit. A maximum of 5 credits may be earned toward electives for a Technology major. Students considering electives for a Technology minor should consult with their departmental advisor.

Pre-requisites: junior or senior status and permission of the instructor, department chair and dean and a declared Mechanical Engineering Technology major.

This course gives students applied field experience working in industry. Students will apply engineering principles to solve problems under the supervision of a practicing engineer. A minimum of 180 hours of work is required for students to complete the internship experience. Students working part-time over multiple quarters will have the credit hours divided across quarters to match the hours worked in each quarter.

METC 499. DIRECTED STUDY. 1-5 Credits.

Pre-requisites: permission of the instructor, department chair and college dean.

Designed for students wanting to pursue a subject beyond the scope of regular courses.