

# MECHANICAL ENGINEERING TECH (MET)

## **MET 1515 Mechanics 1 3 s.h.**

Study of forces as vector quantities; resultants of force systems; principles of mechanical equilibrium; application of principles to problems, devices and structures commonly encountered in industry. Three hours lecture per week.  
**Prereq.:** "C" or better in ENTC 1505 and MATH 1513 or MATH 1510 and MATH 1511 or MATH 1510C and MATH 1511C.

## **MET 2606 Solid Modeling 4 s.h.**

Study of parametric solid modeling and other 3D techniques using Solid Works and Inventor software, including work with geometric dimensioning and tolerancing. Four hours lecture per week.

## **MET 2607 Geometric Dimensioning and Tolerancing 3 s.h.**

Content develops the principles of Geometric Dimensioning and Tolerancing (GD&T) from ASME Y14.5 – 2018 as introduced in MET 2606 Solid Modeling. Specific topics emphasize mechanical detailing to generate production drawings.

**Prereq.:** MET 2606.

## **MET 2616 Mechanics 2 3 s.h.**

Introduction to dynamics of solids, study of various types of motion, Newton's second law, work and energy, impulse and momentum. Three hours lecture per week.

**Prereq.:** MET 1515 "C" or better.

## **MET 2630 Manufacturing Techniques 3 s.h.**

The study of materials and processes used in manufacturing, including casting, heat treatment, hot and cold working, plastics processing and machining, Geometric Dimensioning and Tolerancing.

**Prereq.:** "C" or better in ENTC 1505.

## **MET 2630L Manufacturing Techniques Laboratory 1 s.h.**

Practice and procedures of machine tool operation including lathes, drill presses, shapers, and milling machines. Two hours lab per week. "C" or better in MET 2630 or concurrent with MET 2630.

## **MET 3705 Thermodynamics 4 s.h.**

Properties of ideal and real gases, first and second laws of thermodynamics, application to thermodynamic cycles involving power plants and cyclic machinery.

**Prereq.:** "C" or better in CHEM 1515 or CHEM 1505, "C" or better in EET 3725.

## **MET 3706 Machine Design 1 4 s.h.**

Principles of stresses and deflections, shear and moment diagrams, combined stresses, fatigue, measurement of strain, and theories of failure. Application of these principles to design of machine components. Includes a capstone experience for MET AAS degrees. 4 s.h.

**Prereq.:** "C" or better in CCET 2604, "C" or better in CCET 1503.

## **MET 3707 Machine Design 2 3 s.h.**

Continuation of MET 3706, progressing to the design of machine elements such as gears, belts, clutches, chains, bearings, welded and bolted joints.

**Prereq.:** "C" or better in MET 3706.

## **MET 3710 Tool Design 3 s.h.**

Design and selection of cutting tools, fixtures, bending and forming dies, inspection and gauging instruments, and material feed mechanisms.

**Prereq.:** "C" or better in MET 3706.

## **MET 3711 Heat and Power Cycles 4 s.h.**

A continuation of MET 3705, including the study of heat transfer, the Rankine cycle, the Otto cycle, the Diesel cycle, and the performance of pumps and heat exchangers.

**Prereq.:** "C" or better in MET 3714, "C" or better in MET 3705.

## **MET 3713 Fluid Power Systems 3 s.h.**

Principles of hydraulic and pneumatic systems, including device selection and application. Typical industrial systems are constructed and tested. Three hours lecture per week.

**Prereq.:** MET 1515.

## **MET 3714 Fluid Mechanics 4 s.h.**

Principles of fluid statics and fluid dynamics and their application to incompressible flow in pipes and channels; Bernoulli's equation, laminar and turbulent flow; energy and momentum in fluid flow.

**Prereq.:** "C" or better in MET 1515.

## **MET 3714L Fluid Mechanics Laboratory 1 s.h.**

Fluid Mechanics Lab. Experiments and applications of concepts covered in MET 3714. One hour lab per week.

**Prereq.:** C or better in MET 3714 or concurrent with MET 3714.

## **MET 3720 Mechanisms 3 s.h.**

Graphical and analytical solution of problems involving displacement, velocity, and acceleration in machine mechanisms. Design of linkages with drafting software to provide required motions of machine members. Three hours lecture per week.

**Prereq.:** C or better in MET 2616, "C" or better in MATH 1570 or "C" or better in MATH 1571.

## **MET 4810 Manufacturing Systems Analysis 3 s.h.**

Study of manufacturing systems including manufacturing process design, analysis, selection and sequencing; value analysis, machine tool cost and functions; computer and statistical simulation of production systems. Three hours lecture per week.

**Prereq.:** "C" or better in MET 3706.

## **MET 4812 Numerical Control 2 s.h.**

A study of the programming of numerically-controlled machine tools. Students program NC machines using manual and computer-assisted techniques.

**Prereq.:** C or better in MET 2606, and C or better in MET 2630 and MET 2630L.

**Coreq.:** MET 4812L.

## **MET 4812L Numerical Control Lab 1 s.h.**

A study of the programming of numerically-controlled machine tools. Students program NC machines using manual and computer-assisted techniques. Two hours lab per week.

**Prereq.:** none.

**Coreq.:** MET 4812.

## **MET 4820 Machine Systems 3 s.h.**

Interdisciplinary capstone course. Analysis and design of complex machine systems incorporating previous coursework in solid mechanics, fluid power, machine design, and thermodynamics. Three hours lecture per week.

**Prereq.:** Senior standing in MET and permission of instructor.

## **MET 4830 Intro to Additive Manufacturing 3 s.h.**

Covered topics include learning about the seven different additive manufacturing (AM) technologies and the AM process chain. Other topics covered include software issues, post-processing, rapid tooling, and other applications. Upon completion of this course, students will be able to determine if and when it is appropriate to implement AM technology for a particular application or process line and understand both the positive and negative implications of doing so. Three hours lecture per week.

**Prereq.:** "C" or better in MET 2630.

## **MET 4860 Robotics Technology 2 s.h.**

An application-oriented course on the technology and use of industrial robots, including classification, tooling, sensors, workcell design, safety, and programming.

**Prereq.:** "C" or better in ENTC 1505.

**Coreq.:** MET 4860L.

## **MET 4860L Robotics Technology Laboratory 1 s.h.**

Practice in the programming and application of industrial robots and associated equipment. Construction of simulated robotic workcells using actual industrial robots, programmable controllers, sensors, and grippers. Two hours lab per week.

**Coreq.:** MET 4860.

**MET 4870 Applied Finite Element Method 3 s.h.**

Introduction of the finite element method with an emphasis on modeling and interpretation of results. Linear static problems are solved using commercial finite element analysis (FEA) software, where the results are verified using theoretical calculations. Topics include trusses, frames, plane stress/strain, and 3-D structures. Three hours lecture.

**Prereq.:** "C" or better in MET 3707 or CCET 3709.

**MET 4890 Special Topics in Mechanical Engineering Technology 1-4 s.h.**

New developments in Mechanical Engineering Technology. Subject matter, special prerequisites, and credit hours to be announced in advance of each offering. May be repeated with different subject matter to a maximum of 8 s.h.

**Prereq.:** Senior standing in MET or consent of the instructor.