

# MCT - MECHANICAL ENGINEERING TECHNOLOGY

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## **MCT 3010 Instrumentation Cr. 3**

Theory and use of measurement instruments and techniques; standards and dimensional units; experimental procedures and data analysis; sensors and transducers for parameters such as displacement, stress, strain, force, torque, temperature, motion, sound. Offered Fall, Winter.

**Prerequisites:** EET 2000 with a minimum grade of C- and PHY 2140 with a minimum grade of C-

**Restriction(s):** Enrollment is limited to Undergraduate level students.

**Fees:** \$25

## **MCT 3100 Mechanics of Materials Cr. 3**

The elastic behavior of load bearing materials. Tension, compression, shear, combined stress, bending, torsion and columns. Failure analysis. Offered Fall, Winter.

**Prerequisites:** ET 3030 with a minimum grade of C- and (ET 3430 with a minimum grade of C- (may be taken concurrently) or MAT 2010 with a minimum grade of C- (may be taken concurrently))

**Fees:** \$10

## **MCT 3410 Kinematics and Dynamics of Machines Cr. 3**

Velocity and acceleration of moving parts in machine elements and mechanisms; cam, gear, and gear train design; static and inertial forces, balancing, gyroscopic effects, and critical speeds. Offered Fall, Winter.

**Prerequisite:** ET 3050 with a minimum grade of C-

## **MCT 4150 Applied Thermodynamics Cr. 3**

Introduction to the concept of energy and the laws governing the transfers and transformations of energy. Emphasis on thermodynamic properties and the first and second law analysis of systems and control volumes. Integration of these concepts into the analysis of different power and refrigeration cycles. Offered Yearly.

**Prerequisites:** (ET 3430 with a minimum grade of C- or MAT 2010 with a minimum grade of C-), CHM 1020 with a minimum grade of C-, and (PHY 2130 with a minimum grade of C- and PHY 2131 with a minimum grade of C-)

**Fees:** \$10

## **MCT 4180 Fluid Mechanics Cr. 3**

Properties of fluids, fundamentals of fluid flow, dimensional analysis and similitude, and flow measurement techniques. Introduction to internal and external flows and how to analyze them. Analysis of hydrostatic equipment, hydrokinetic equipment and systems. Introduction to network analysis and calculation. Offered Yearly.

**Prerequisites:** ET 3030 with a minimum grade of C- and ET 3450 with a minimum grade of C- (may be taken concurrently)

## **MCT 4210 Heat Transfer Cr. 3**

Basic modes of heat transfer and their applications. Steady state conduction in one and two dimensions and transient conduction. Numerical and graphical methods. Heat exchanges. Condensation and boiling heat transfer. Introduction to mass transfer. Offered Yearly.

**Prerequisites:** MAT 3450 with a minimum grade of C- (may be taken concurrently) and PHY 2140 with a minimum grade of C-

## **MCT 4400 Design of Machine Elements Cr. 3**

Fundamental concepts in the design of the separate elements which compose the machine; application of properties and mechanics of materials modified by practical considerations. Offered Yearly.

**Prerequisites:** MCT 3100 with a minimum grade of C- and MCT 3410 with a minimum grade of C- (may be taken concurrently)

## **MCT 4990 Guided Study Cr. 1-6**

Supervised study and instruction in the field selected by the student.

Offered Intermittently.

**Repeatable for 6 Credits**

## **MCT 5150 Hybrid Vehicle Technology Cr. 3**

Technical concepts and design, energy analysis, unified modeling approach, optimization, control; power generation, engine overview, concepts of hybridization, on-board energy storage; overview of motors, transmissions, fuel cells, future applications. Offered Fall.

**Prerequisites:** ET 3450 with a minimum grade of B+ and PHY 2140 with a minimum grade of B+

## **MCT 5210 Energy Sources and Conversion Cr. 3**

Various energy sources and how they are utilized. Wind, solar, geothermal, fuel cells, storage devices, energy economics and transportation techniques, related to harnessing energy to a usable form such as electricity and heat. Offered Fall.

**Prerequisites:** (ET 3430 with a minimum grade of C- or MAT 2010 with a minimum grade of C-) and PHY 2140 with a minimum grade of C-