MECHANICAL ENGINEERING TECHNOLOGY

MCET 102 MACHINES LABORATORY -1 semester hour **F, Sp** Basic hand tools, shop safety procedures; fundamental machine operations of drilling, sawing, milling, turning; inspection tools, gauges, measuring instruments.
Prerequisite: None

MCET 200 STATICS - 3 semester hour **F**
Force systems, resultants, and equilibrium; trusses, method of joints, method of sections; friction; centroids, moments of inertia.
Prerequisites: MATH 150 Precalculus or equivalent and ENGT 100 Introduction to Engineering Technology
Corequisite: PHYS 105 Physics I

MCET 201 STRENGTH OF MATERIALS - 3 semester hours **Sp**
Stress and deformation; axial, tensile and compressive stresses, torsion; shear and moment in beams; stresses in beams; and design of beams.
Prerequisite: MCET 200 Statics

MCET 202 STRENGTH OF MATERIALS LAB -1 semester hour **p**
Tensile, compressive, torsional, bending, impact, hardness, and fatigue tests of materials; use of electrical resistance strain gages; statistical evaluation of data.
Prerequisites: MCET 200 Statics and MCET 102 Machines Lab.
Corequisite: MCET 201 Strength of Materials

MCET 301 INTRODUCTION TO THERMODYNAMICS - 3 semester hours **p**
An introduction to fundamentals of thermodynamics; including work and heat; first and second laws; properties of gases, gas mixtures; compression and expansion of gas steam tables are covered.
Prerequisites: MATH 260 Calculus I

MCET 305 MANUFACTURING MATERIALS AND PROCESSES - 3 semester hours **p**
The study of the physical and mechanical properties of various materials as applied to design, processing, and fabrication methods.
Prerequisites: MCET 201 Strength of Materials

MCET 306 MACHINE DESIGN I - 3 semester hours **F**
The design of basic elements used in machines, including machine columns, welds, rivets, screws, springs, flexible couplings, belt and chain drives. Design for fatigue strength is included.
Prerequisites: MCET 201 Strength of Materials, ENGR 200 Engineering Graphics and MATH 260 Calculus I

MCET 307 KINEMATICS OF MACHINES - 3 semester hours **F, Sp**
The study of techniques for the analysis of displacement, velocity, and acceleration of machine elements; emphasis on graphical kinematics of linkages; introduction to cams.
Prerequisites: ENGR 200 Engineering Graphics and MCET 311 Dynamics

MCET 311 DYNAMICS - 3 semester hours **F**
The kinematics and kinetics of particles and rigid bodies; rectilinear and curvilinear motion, work, energy, impulse and momentum. Use of computers for problem solving is included.
Prerequisites: MCET 200 Statics, MATH 261 Calculus II and PHYS 105 Physics I

MCET 313 FLUID MECHANICS - 3 semester hours **F**
Properties of fluids; fluid statics and dynamics, including momentum, energy, Bernoulli's equation, fluid flow in pipes, fluid machinery, and open channels: study of the siphon, pitot tube, venturi meter, orifices, nozzles, diffusers, weirs, etc.
Prerequisites: MCET 200 Statics and MATH 260 Calculus I

MCET 314 FLUID MECHANICS LABORATORY - 1 semester hour **F**
Laboratory demonstrations, experiments, and exercises dealing with the verification of fluid equations, and principles and characteristics of fluid machinery.
Corequisite: MCET 313 Fluid Mechanics

MCET 401 APPLIED THERMODYNAMICS - 3 semester hours **F**
Study of thermodynamic cycles; includes Carnot, Rankine, Sterling and Application of thermodynamic principles to turbines and compressors.
Prerequisites: MCET 301 Introduction to Thermodynamics and MATH 261 Calculus II

MCET 403 QUALITY CONTROL - 3 semester hours **F, Sp**
A study of the principles and techniques of quality control and its applications to industrial processes. Topics include: An overview of Total Quality Management (TQM), statistics, process control charts, and probability. The relationship between process capability and product specifications is analyzed.
Prerequisite: ENGT 105 Engineering Problem Solving

MCET 404 ENERGY LABORATORY - 1 semester hour
F A study of heat transfer equipment; shell and tube heat exchangers, energy conversion from chemical to mechanical energy; calorimeters; internal combustion engines (diesel and Otto cycles).
Corequisite: MCET 401 Applied Thermodynamics

MCET 406 MACHINE DESIGN II - 3 semester hours **F, Sp**
A further development of the principles and techniques of machine element design with particular regard to gears, axles and shafts, bearings, clutches, brakes, gaskets and seals. Design projects are included.
Prerequisite: MCET 306 Machine Design I

MCET 415 INSTRUMENTATION AND CONTROLS - 3 semester **Sp**
A study of the basic concepts and principles associated with the operation and use of sensors and instruments for the measurement and for the control of various properties (temperature, pressure, liquid level, fluid flow, etc.); accuracy and reliability of instruments and their role in control systems.
Prerequisites: ELET 410 Introduction to Electricity and Electronics

MCET 416 MEASUREMENTS LABORATORY - 1 semester hour **Sp**
Experiments are conducted to reinforce and expand on concepts learned in MCET 415 lecture course; emphasis is on electrical and electronic devices used in mechanical measurements; included as various types of transducers, bridge circuits, and operational amplifiers.
Corequisite: MCET 415 Instrumentation and Controls

MCET 421 HYDRAULICS AND PNEUMATICS - 3 semester hours **Sp**
Fundamentals of hydraulic and pneumatic system design and troubleshooting; topics include circuit diagrams, valves, rotary activators, cylinders, pumps, piping and fitting losses.
Prerequisite: MCET 313 Fluid Mechanics

MCET 422 HYDRAULICS AND PNEUMATICS LAB - 1 semester hour Sp
Selected design problems and projects dealing with principles and methods discussed in MCET 421. Preparation of circuit diagrams, flow charts, and detailed designs; circuits are set up and analyzed.
Corequisite: MCET 421 Hydraulics And Pneumatics

MCET 441 HEAT TRANSFER - 3 semester hours F, Sp
A course on the fundamental principles of heat transfer with a broad range of engineering applications. The classic modes of heat transfer, steady state and transient conduction, natural and forced convection, and radiation, will be emphasized. Both numerical and analytical solutions are discussed and illustrated. Application to problems associated with both mechanical and electronic engineering will be demonstrated through problems such as those related to the heating and cooling of buildings and the cooling of electronic equipment.
Prerequisite: Math 261 Calculus II and permission of instructor

MCET 499 SPECIAL TOPICS IN ENGINEERING TECHNOLOGY - 3 semester hours F, Sp
A course or independent study covering some topic in Engineering Technology as technical elective. Goal is to enhance student skill and knowledge in relevant topic.
Prerequisite: Permission of instructor