

ME 1110

Engineering Drawing

2 credits

Descriptive geometry, orthographic, isometric and oblique drawings, drawing of mechanical parts, detailed drawing and assembly drawings, allowable tolerance, and surface details.

ME 1112

Engineering Laboratory

2 credits

To get acquainted with simple machine tools, electrical wiring and transformer winding, practice of basic electrical measuring instruments and basic electrical devices assembly with circuit diagrams. A full report of each job is required.

ME 1113

Engineering Drawing

3 credits

Descriptive geometry, orthographic, isometric and oblique drawings, drawing of mechanical parts, detailed drawing and assembly drawings, allowable tolerance, and surface details. Applied geometry, dimensions and notes, orthographic projections, working drawing, auxiliary views, true length, grade and bearings of a line, true shape of a plane surface, perspective, sectional and developed drawings.

ME 2120

Engineering Statistic

3 credits

Prerequisite: BG 1211 Physics I

Force systems; resultant; equilibrium; friction; principle of virtual work; stability.

ME 2121

Engineering Dynamics

3 credits

Prerequisite: ME 2121 Engineering Static

Kinematics and kinetics of particles and rigid bodies; Newton's second law of motion; work and energy; impulse and motion; fundamentals of vibration.

ME 2210	Engineering Mechanics	3 credits
Prerequisite:	BG 1211 Physics I	

Force systems, moment of forces and couples, free-body diagram, equilibrium of forces, kinematics and kinetics of particles, rectilinear motion, curvilinear motion, 2nd law of Newton's, works and energies, impulse and momentum, and direct and oblique central impact.

ME 3110	Mechanics of Machinery	3 credits
Prerequisite:	ME 2121 Engineering Dynamics	

Forces and stresses; stresses and strains relationship; stresses in beams, shear force and bending moment diagrams; deflection of beams, torsion; buckling of columns; Mohr's circle and combined stresses; failure criterion.

ME 3120	Mechanics of Machinery	3 credits
Prerequisite:	ME 2121 Engineering Dynamics	

Velocity and acceleration analysis; kinetics and dynamics force analysis of mechanical devices, linkages, gear trains and mechanical systems; balancing of rotating and reciprocating mass.

ME 3310	Thermofluids	3 credits
Prerequisite:	BG 1205 Calculus II and BG 1213 Physics II	

Workdone, energy, power, unit, system, state, and field processes, compressible flows, mass conservation systems, properties of fluids, state equation, first law of thermodynamics, non-flow systems, energy equation, Bernoulli's equation, linear and polar momentum equation, ideal flow.

ME 3311	Pneumatic and Hydraulic Systems	3 credits
Prerequisite:	ME 2120 Engineering Dynamics	

Fundamental of Fluid Mechanics, Basics; energy, power, needs for controllable and efficient transmission of power; Hydraulic systems; pumps, valves, actuators, motors, typical applications, case studies; Mechanical systems; types, applications, main features.

ME 3312	Pneumatic and Hydraulic Systems Lab	1 credits
Prerequisite or Corequisite:	ME 4312 Pneumatic and Hydraulic Systems	

Laboratory works to be done according to ME 4312 Pneumatic and Hydraulic Systems.

ME 4010	Machine Analysis and Design	3 credits
Prerequisite :	ME 1113 Engineering Drawing and ME 2212 Mechanics of Machinery	

Fundamental of mechanical design; properties of materials, theories of failure; design of simple machine elements, rivets, screw fasteners, keys and pins, shafts, springs, power screws, coupling etc.; design project.

ME 4310	Mechanical Vibration	1 credits
Prerequisite:	ME 2121 Engineering Dynamics	

## 150 coursedescription

System with one degree of freedom; torsional vibration, free and forced vibration, method of equivalent system, systems having several degrees of freedom; methods and techniques to reduce and control vibration.

ME 4410	Thermodynamics	3 credits
Prerequisite:	BG 1213 Physics II BG 1108 General Chemistry	

First Law of thermodynamics; Second law of Thermo dynamics and Carnot cycle, energy: entropy; basic heat transfer and energy conversion.

ME 4411	Heat Transfer	3 credits
Prerequisite:	ME 4410 Thermodynamics	

Modes of heat transfer, thermal conductivity; heat conduction equation, steady- state, one-and two-dimensional wave equation, unsteady- state heat conduction, radiation, fundamentals of convection heat transfer.

ME 4412	Internal Combustion Engines	3 credits
Prerequisite:	ME 4410 Thermodynamics	

Internal combustion engine fundamentals, spark-ignition and compression-ignition engines, fuels and combustion, ignition systems, ideal fuel air cycle, supercharging and scavenging, performance and testing, lubrication.