MECHANICAL ENGINEERING (ME)

ME 502 Principles and Practices-ME **2 Credit hours**
Grade Mode: Normal Grading Mode

ME 515 Vehicle Dynamics **3 Credit hours**
Deals with ground vehicle stability and control. Contribution of tire lateral force, stiffness, and aligning torque to stability. Effects of suspension geometry, chassis stiffness, and roll stiffness.
Grade Mode: Normal Grading Mode

ME 520 Intro Comp Fluid Dynamic **3 Credit hours**
This course covers governing equations, ordinary differential equations (ODEs), numerical integration; finite difference and finite volume methods for parabolic, ellipitic, hyperbolic partial differential equations (PDEs), numerical linear algebra; turbulence modeling.
Grade Mode: Normal Grading Mode

ME 530 Renewable Energy **3 Credit hours**
Basic principles and technical details of various renewable energy technologies for the sustainable future. Process design, energy analysis, engineering economics and environmental assessment of renewable energy systems.
Grade Mode: Normal Grading Mode

ME 545 Nano-Materials **3 Credit hours**
Covers fundamentals of nanomaterial and nanotechnology. Unique properties of nanomaterials. Synthesis methods of various nanomaterials. Nano and microfabrication techniques. Applications of nanomaterials in various technologies, environmental science, biotechnology and biomedicine.
Grade Mode: Normal Grading Mode

ME 560 Automation and Control **3 Credit hours**
This course provides an overview of the principles of automation and concept of system control, including instrumentation, control, human interface, and communication subsystems.
Grade Mode: Normal Grading Mode

ME 601 Advanced Engr Analysis I **3 Credit hours**
The core of this course is to learn advance analytical and computational methods to solve multi-dimensional conduction, convection-advection, mechanical vibration, and elasticity equations.
Grade Mode: Normal Grading Mode

ME 602 Advanced Engr Analysis II **3 Credit hours**
This is the second course in a two-course sequence to learn advanced analytical and computational methods to solve multi-dimensional diffusion, heat, biharmonic, and elasticity equations.
Pre-req: ME 601.
Grade Mode: Normal Grading Mode

ME 604 Research Methods **3 Credit hours**
Research methods in engineering conducting critical reviews of research literature, preparing pre-proposal, and initiating background research on a thesis topic. Student is expected to submit a thesis pre-proposal.
Attributes: No Textbook Required
Grade Mode: Normal Grading Mode

ME 617 Additive Manufacturing **3 Credit hours**
Additive manufacturing (AM), rapid prototyping, rapid tooling, joining processes, direct digital manufacturing to form 3D parts with applications ranging from prototyping to production in aerospace, defense, and biomedical industries.
Grade Mode: Normal Grading Mode

ME 621 Corrosion Engineering **3 Credit hours**
Covers the causes and mechanisms of aqueous corrosion, electrochemistry and thermodynamicsof corrosion. Materials selection, design for minimization of corrosion, and corrosion protection. Case studies are discussed.
Grade Mode: Normal Grading Mode

ME 625 Tribology **3 Credit hours**
Detailed coverage of the mechanisms of friction, material wear, and major lubrication techniques - liquids, solids, and gases - with traditional and modern applications. Coverage of micro/nanotribology, MEMS, and magnetic surface storage applications.
Grade Mode: Normal Grading Mode

ME 628 Applied Biomaterials **3 Credit hours**
Covers the knowledge needed to select and design biomaterials used in medical devices with emphasis on metallic, ceramic, polymeric, and composite biomaterials. Explains the difference between materials science and materials engineering.
Grade Mode: Normal Grading Mode

ME 630 Manufacturing Systems **3 Credit hours**
This course covers tool design and metal cutting theory, CAD/CAM, CIM, CNC m/c, CNC programming, fixture design, metal forming, gear manufacturing, non-tradtional machining, PLC, flexible manufacturing, robotics, rapid prototyping/tooling.
Grade Mode: Normal Grading Mode

ME 635 Advanced Vibrations **3 Credit hours**
Modeling of vibratory motion of advanced mechanical and structural systems, including continuous systems, nonlinear systems and systems with random excitations.
Grade Mode: Normal Grading Mode

ME 640 System Modeling **3 Credit hours**
Overview of system modeling and simulation of complex systems with mechanical, hydraulic, thermal and/or electrical elements. Frequency response analysis, stability, and numerical analysis of system modeling.
Grade Mode: Normal Grading Mode

ME 645 Nonlinear Dynamics **3 Credit hours**
Nonlinear dynamical systems, including concepts of chaos, fractal and classic dynamics equations, one dimension systems, two dimension systems, phase plane, limit cycle, bifurcation, Lorenz equation, and fractals.
Grade Mode: Normal Grading Mode

ME 649 Sustainable Energy Management **3 Credit hours**
Sustainable energy management, provides an overview of mechanical and control systems within buildings with sub-systems which possess a visible energy signature in terms of energy usage, inefficiency, and impact.
Attributes: No Textbook Required
Grade Mode: Normal Grading Mode

ME 650 Special Topics **1-4 Credit hours**
Subject matter to be selected from topics of current interest.
Grade Mode: Normal Grading Mode

ME 651 Special Topics **1-4 Credit hours**
Subject matter to be selected from topics of current interest.
Grade Mode: Normal Grading Mode

ME 652 Special Topics **1-4 Credit hours**
Subject matter to be selected from topics of current interest.
Grade Mode: Normal Grading Mode

ME 653 Special Topics **1-4 Credit hours**
Subject matter to be selected from topics of current interest.
Grade Mode: Normal Grading Mode

ME 699 Thesis **1-6 Credit hours**
This course covers the communication problems encountered in researching and writing a thesis: the scientific writing of a research paper, the speaking and presenting skills, and the organization skills.
Grade Mode: Normal Grading Mode