MECHANICAL ENGINEERING (ME)

Subject-area course lists indicate courses currently active for offering at the University of Louisville. Not all courses are scheduled in any given academic term. For class offerings in a specific semester, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm).

500-level courses generally are included in both the undergraduate- and graduate-level course listings; however, specific course/section offerings may vary between semesters. Students are responsible for ensuring that they enroll in courses that are applicable to their particular academic programs.

Course Fees

Some courses may carry fees beyond the standard tuition costs to cover additional support or materials. Program-, subject- and course-specific fee information can be found on the Office of the Bursar website (http://louisville.edu/bursar/tuitionfee).

ME 510. Thermal Design of Internal Combustion Engines **3 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): ME 310.
Description: Thermodynamics and fluid mechanics of internal combustion engine design. Combustion stoichiometry, thermochemistry, and properties of working fluids. Ideal and real engine cycles. Fluid flow processes, combustion processes, pollutant formation and control. Engine operating characteristics.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 512. Finite Element Methods for Mechanical Design I **3 Units**
Term Typically Offered: Occasionally Offered
Prerequisite(s): ME 422.
Description: Matrix analysis of static and dynamic structural systems and steady-state heat transfer. Computer aided design of trusses, frames, plane stress structures, as well as one- and two-dimensional thermal systems including conduction and convection.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 513. Energy Conversion **3 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): ME 310.
Description: A study of nuclear and fossil-fueled steam generators, plus internal combustion prime movers and alternate energy sources. A computerized design project will be required.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 521. Mechanical Vibrations **3 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): ME 422.
Description: The theory of vibrating mechanical systems. Modeling of lumped parameter and distributed parameter systems. Free and forced vibration. Damping. Periodic and transient motion. Concept of normal modes. Multiple degree-of-freedom systems. Design applications.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 523. Intermediate Dynamics **3 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): ME 206.
Description: Extension of the concepts in introductory dynamics (ME 206) to three dimensional motion. This includes the kinematics of multiple, rotating reference frames, and Newtonian vector mechanics for particles and rigid bodies (Euler's equations). Lagrangian analytical methods. Stability of motion.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 526. Vehicle Dynamics and Handling **3 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): ME 380.
Description: Design of passenger and commercial vehicles for optimal dynamic performance with a focus on architecture layout, characterization of critical subsystems, and CAE-based kinematic and kinetic modeling.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 530. Mechanical Design of Consumer Appliances **3 Units**
Term Typically Offered: Fall, Spring, Summer
Description: Application of classical, computational, and experimental methods and analyses to the design of mechanical systems characteristic of consumer appliances. Topics include component analysis and design, failure mechanisms, and organization with respect to life, reliability, performance, and cost.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 531. Consumer Appliance Energy Systems **3 Units**
Term Typically Offered: Fall, Spring, Summer
Description: Analysis and design of energy systems in home appliances. Topics include thermal-fluid process fundamentals, energy transport, storage, use, and conversion, energy system components and materials, and the affect of extreme environments on components and finishes.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 532. Experimental Stress Analysis **3 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): ME 323, ME 414 and ME 415 or graduate standing in Mechanical Engineering.
Description: Fundamentals of experimental stress analysis. Brittle coating methods, photoelastic coating and electrical strain gage techniques, strain measurements under static and dynamic loading.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 534. Experimental Vibrations **3 Units**
Term Typically Offered: Summer Odd Years
Prerequisite(s): ME 435.
Description: Experimental techniques for identifying the modal parameters of mechanical and structural systems. Review of multiple degree-of-freedom vibration modeling and analysis. Measurement of frequency response functions. Excitation techniques,instrumentation, Fourier analysis and signal processing. Acoustical modal analysis. Experiments on real mechanical and structural systems.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 535. Control System Design **3 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): ME 435.
Description: Basic concepts and principles of feedback control systems. Formulation of linear control problems by classical methods. Analysis and synthesis techniques as used in the design of automatic, dynamic control systems. Study of transient and steady state response, use of time and frequency domain concepts. System performance specifications. Design applications.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 542. Gas Turbines **3 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): ME 310 and ME 401.
Description: Theory and design of various types of gas turbine engines used for power and propulsion. Thermodynamic cycle analysis; design basics of turbomachinery, nozzles, diffusers and combustion chambers; engine performance analysis.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 544. Design of Fluid Power Systems **3 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): ME 380 and ME 401.
Description: Design methodology of hydraulic circuits and fluid power components. Study of rotary/linear actuators, hydrostatic transmissions, temperature control, cotamination control, pneumatics,valves, and control components. Applied design projects and laboratory modules are required.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 555. Introduction to Micro and Nanotechnology **3 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): CHE 253 or equivalent; Senior or Graduate standing in an engineering program.
Description: Design, fabrication and application of micro- and nano-electro-mechanical systems (MEMS/NEMS). Scaling laws governing micro-and nanoscale physics. Use of MEMS/NEMS devices in electronics, as sensors, and for medical applications.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 559. Process Physics & Material Science in Advanced Manufacturing **3 Units**
Term Typically Offered: Spring Only
Prerequisite(s): ME 323 and ME 381.
Description: Materials processing lies at the core of advanced manufacturing. It is through understanding and innovations in materials processing, true progress in manufacturing development can be reached. Topics include mechanical, thermal, electrochemical, acoustic, optical energy-based material processing physics, physical metallurgy, phase transformation, solidification, heat and mass transfer, dislocation mechanics in the context of manufacturing.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 562. Composite Materials **3 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): ME 422.
Description: Overview of composite materials, stress/strain analysis of a polymer matrix fiber-reinforced composite ply, classical lamination theory, failure criteria, design approaches, manufacturing methods, and applications for structural polymeric composites.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 565. Advanced Engineering Mathematics I **3 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): ENGR 201 or ENGR 205 or equivalent.
Description: Formulation and solution of mathematical models for mechanical engineering problems leading to ordinary and partial differential equations. Transform solution methods and linear algebra concepts, including real and complex-domain eigenvalue problem solutions.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 566. Advanced Engineering Mathematics II **3 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): ME 565 or equivalent.
Description: Analysis of engineering systems and phenomena yielding complex domain models and solutions. Power series, Taylor series, and Laurent series. Complex analysis and potential theory. Numerical analysis for complex domain systems. Introduction to optimization and linear programming.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 570. Sustainable Energy Systems **3 Units**
Term Typically Offered: Fall Only
Prerequisite(s): ME 310 and ME 311.
Description: Analysis and design of sustainable energy systems, and exploration of concepts such as carbon capture storage for making fossil energy systems more environmentally acceptable.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 572. Energy Storage Systems **3 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): ME 440.
Description: Study of the principles and analysis of energy systems. Introduction to energy storage systems and their applications; thermal and mechanical energy storage, storage of organic fuels, hydrogen, and electrochemical energy.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 575. Special Topics in Mechanical Engineering **1-4 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): Faculty consent.
Description: A special topics course in mechanical engineering topics not covered by regularly scheduled courses.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 580. Air Pollution Control **3 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): CHEM 202, ME 310 or equivalent.
Description: Origin and fate of air pollutants, combustion and pollutant formation processes, control of emissions of gaseous and particulate pollutants and design of various pollution control devices.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 585. Design and Energy Analysis of Consumer Appliances **4.5 Units**
Description: Application of classical, computational, and experimental methods and analysis to the design of mechanical and energy systems. Topics include material impacts on design, structural component design, and design and analysis of thermal fluid, and acoustic systems.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 588. Independent Study in Mechanical Engineering **1-4 Units**
Term Typically Offered: Fall, Spring, Summer
Prerequisite(s): Faculty consent.
Description: A theoretical or experimental investigation of a problem area related to mechanical engineering.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 595. Measurement, Reliability, and Thermal Design of Electromechanical Systems **4.5 Units**
Prerequisite(s): ME 585.
Description: Application of classical, computational, and experimental methods and analyses to the design of electromechanical systems. Topics include reliability and failure analysis, measurement and control of electromechanical systems, and analysis and design optimization of thermal systems.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 602. Graduate Internship in Mechanical Engineering **2 Units**
Grading Basis: Pass/Fail
Prerequisite(s): Students must be admitted for graduate study, and a sponsored member of the Graduate Intern Program.
Description: Supervised professional experience in industry at the graduate level. This course provides the structure and focus for the graduate intern field assignment to ensure that the assignment is appropriate and consistent with the intern's graduate course of study and professional development. May be repeated for credit.
Course Attribute(s): CBL - This course includes Community-Based Learning (CBL). Students will engage in a community experience or project with an external partner in order to enhance understanding and application of academic content.

For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 606. Continuum Mechanics **3 Units**
Prerequisite(s): Graduate standing, ME 311 and ME 323.
Description: Emphasizes the basic principles of continuum mechanics and the central role these principles play in the formulation of the fundamental equations of fluids and solid mechanics.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 610. Data Acquisition and Signal Analysis **3 Units**
Prerequisite(s): Graduate/Graduate Professional standing in Mechanical Engineering or instructor permission.
Description: Implementation of PC-based data acquisition systems for dynamic signal analysis. The LabView graphical programming language will be used to design virtual instruments for data collection and signal analysis.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 612. Finite Element Methods for Mechanical Design II **3 Units**
Prerequisite(s): ME 512.
Description: Use of general purpose software for practical structural, thermal, and fluid design applications, including nonlinear and transient effects. Advanced modeling techniques, and analysis guideline with emphasis on interpretation of results.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 614. Heating, Ventilating, and Air Conditioning **3 Units**
Prerequisite(s): ME 440.
Description: Psychometric principles. Detailed calculation of heat loses and heat gain for both heating and cooling of buildings. Basic concepts of refrigeration. Design of actual systems and selection of equipment. Automatic controls. Codes and standards. A design project will be required.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 618. Heat Exchanger Design **3 Units**
Prerequisite(s): ME 401 and ME 440.
Description: Thermal and hydraulic design of heat exchangers. Selection and optimum design of heat exchangers. Cost and construction of heat exchangers.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 620. Advanced Mechanics of Solids **3 Units**
Prerequisite(s): ME 432 or equivalent.
Description: Analysis of stress and strain. Topics include failure theories, unsymmetric bending, curved beams, shear center, torsion, beams on elastic foundations, beams with combined axial and lateral loads, thick-wall cylinders, rotating disc, introduction to elastic stability.
Note: Cross-listed with CE 620.

For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 621. Noise and Vibration Control **3 Units**
Prerequisite(s): ME 422 and ME 414.
Description: Practical aspects of noise and vibration control are studied. Methods for measuring and analyzing noise and vibration. Methods for selecting design criteria. Methods for quieting a product.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 625. Mechanical Design of Internal Combustion Engines **3 Units**
Prerequisite(s): ME 310, ME 380, and ME 442, or equivalents.
Description: Principles and procedures for the mechanical design of internal combustion engine components and systems for strength,endurance,and optimal performance. Design projects and computer applications are emphasized,
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 626. Vehicle Body Structure Design **3 Units**
Prerequisite(s): ME 380 and ME 442, or equivalent.
Description: Principles of structural analysis and design for commercial and passenger vehicle bodies. Body architecture. Fabrication/assembly options. NVH assessment and optimiization. Material selection for safety,reliabilty, cost reduction and weight reduction.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 630. Turbomachinery **3 Units**
Prerequisite(s): ME 310 and ME 401.
Description: The thermodynamics and fluid mechanics of turbomachinery. Dimensional analysis and performance mapping. Preliminary design procedures. Blading and flow path design. Experimental and theoretical methods for determination of flow losses. Flow field calculations and performance prediction.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 635. Advanced Control Systems **3 Units**
Term Typically Offered: Fall Even Years
Description: Design of modern control systems including state-space realizations and observer design. Introduction to non-linear control systems including phase plane analysis, nonlinear stability analysis, describing functions, feedback linearization and anti-windup compensation. Advanced control methods covered include sliding mode control and adaptive control.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 638. Computational Methods in Fluid Flow and Heat Transfer **3 Units**
Prerequisite(s): Graduate School or Professional School Standing.
Description: Solutions of the momentum and thermal boundary-layer equations; methods of solving boundary-value problems using digital computers. Finite-difference methods, finite-element methods, and other methods for solving equations of fluid flow and heat transfer. Turbulence models.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 639. Injury Biomechanics **3 Units**
Prerequisite(s): ME 649 or BE 354 or equivalent or permission of the instructor.
Description: Application of mechanics to the study of human injury. Response of the human body to injurious conditions. Injury tolerance of the human body. Applications to child abuse, transportation safety and medico-legal environment.
Note: Cross-listed with BE 639.

For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 640. Optimum Design Methods **3 Units**
Prerequisite(s): ME 422 or equivalent.
Description: Methods and applications of engineering design optimization. Strategies for problem formulation. Transformation methods, search techniques, linearization methods and quadratic approximation methods. Solution evaluation.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 641. Advanced Mechanics of Machinery **3 Units**
Prerequisite(s): ME 442 and ME 521.
Description: Machine analysis and design for high speed, high performance applications. Rigid-body kinematics and dynamics of mechanisms, balancing of machinery. Cam-follower mechanisms. Mathematical modeling of mechanisms composed of elastically deformable elements such as gears, bearings, linkages and acuators. Transient and steady-state dynamic response. Failure modes and prevention. A design project is required.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 644. Mechatronics **3 Units**
Description: Introduction to multi-domain systems. Mechanical, electrical, electronic, electromechanical system dynamics. Emphasis on modeling and simulation of hybrid systems using modern computer-aided tools.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 645. Mechanical Engineering Structured Research Project **3 Units**
Prerequisite(s): Graduate/professional school standing.
Description: Structured research in a mechanical engineering discipline. A proposal, activity reports and final report are required. Research results are presented for faculty and peer review, and must also be documented in a scholarly paper targeted toward a journal or technical conference. Intended for candidates for the Master of Engineering degree choosing the non-thesis curriculum alternative.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 646. Design for Manufacturability and Reliability **3 Units**
Prerequisite(s): ME 442 and IE 360.
Description: Introduction to manufacturing concerns such as efficient assembly, producibility, and quality that should be considered early in the design process. Topics include the product development cycle, manufacturing process selection, tolerancing, design for assembly, quality control techniques, Taguchi's robust design methodology, quality function deployment, value engineering and reliability-based design. Life cycle optimization.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 647. Advanced Design Methods **3 Units**
Prerequisite(s): ME 442 and ME 497.
Description: Practical techniques for product definition, concept generation and selection, value analysis, parameter design, design for manufacture, life cycle design and product structuring.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 650. Biofluid Mechanics **3 Units**
Prerequisite(s): ME 401.
Description: Application of the Navier-Stokes equation to flow in the human body and to other biological systems.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 651. Kinematics and Kinetics of Human Movement **3 Units**
Prerequisite(s): ME 206.
Description: Development of analytical tools for evaluating three-dimensional kinematics and kinetics of human motion.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 652. Advanced Human Biodynamics **3 Units**
Prerequisite(s): ME 651.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 661. Advanced Thermodynamics **3 Units**
Prerequisite(s): Graduate or Professional school standing.
Description: Review of thermodynamic fundamentals, with application to selected topics. Irreversible, non-equilibrium thermodynamics.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 662. Intermediate Heat Transfer **3 Units**
Prerequisite(s): ME 440.
Description: Classical heat conduction solutions and numerical techniques. Intermediate convection and radiative heat transfer topics.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 667. Solar Energy Applications **3 Units**
Prerequisite(s): ME 401 and ME 440.
Description: Theory of solar radiation transmission,absorption and reflectance. Heat transfer in solar energy devices. Design methods for heating of buildings by solar energy. Active and passive solar applications.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 668. Advanced Mechanical Vibrations **3 Units**
Prerequisite(s): ME 521.
Description: Analytical and computational methods for mechanical vibration problems. Formulation and solution techniques. Modeling and applications.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 669. Advanced Dynamics **3 Units**
Prerequisite(s): Graduate or Professional school standing.
Description: Kinematics and dynamics of rigid-body motion. An introduction to variational mechanics, including generalized coordinates and Lagrange's equations of motion. Stability of motion, including the Routh-Hurwitz criterion and the Liapounov direct method.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 670. Experimental Fluid Mechanics **3 Units**
Term Typically Offered: Occasionally Offered
Description: This course provides a graduate-level introduction to the basic theory and practical application of several important experimental techniques used in fluid dynamics. Topics include techniques for the measurement of material properties, pressure, density, force, fluid velocity, temperature and heat flux. The course will also review applications of measurement techniques for non-Newtonian fluids, hydraulics, microfluids, and other special-case topics. Fundamentals of data processing and data acquisition will be discussed.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 671. Advanced Fluid Mechanics **3 Units**
Prerequisite(s): ME 401.
Description: A study of the Navier-Stokes equation, with application to laminar and turbulent-flow fields for various geometries. Computer applications.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 675. Advanced Topics in Mechanical Engineering **1-6 Units**
Prerequisite(s): Faculty consent.
Description: An advanced course in mechanical engineering topics not covered by regularly scheduled courses.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 688. Independent Study in Mechanical Engineering **1-6 Units**
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 690. Master of Science Thesis in Mechanical Engineering **1-6 Units**
Description: Experimental and/or theoretical thesis research performed as part of Master of Science degree requirements.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 694. Mechanical Engineering Seminar **0 Units**
Grading Basis: Pass/Fail
Prerequisite(s): Graduate or Professional school standing.
Description: Presentations on research projects and current literature. Course begins in the fall semester and concludes in the spring semester.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 695. Platform Engineering Project **3 Units**
Prerequisite(s): ME 530, ME 531, and ECE 532.
Description: Major product development project involving a multidiscliplinary team working on design and/or research problems associated with consumer appliance technologies. Concurrent topics on project realization and management. A proposal, activity reports and final report are required. Project results are presented for faculty and peer review.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 697. Master of Engineering Thesis in Mechanical Engineering **1-8 Units**
Prerequisite(s): Graduate or Professional school standing.
Description: Original design or research activity in a mechanical engineering discipline, under the direction of a faculty member. A written thesis must be presented to a faculty committee and defended. Intended for candidates for the Master of Engineering degree choosing the thesis curriculum alternative.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)

ME 700. Dissertation Research in Mechanical Engineering **1-18 Units**
Prerequisite(s): Completion of doctoral program core and permission of dissertation director.
Description: Original research activity in an appropriate mechanical engineering discipline, under the direction of a Mechanical Engineering graduate faculty member.
For class offerings for a specific term, refer to the Schedule of Classes (http://htmlaccess.louisville.edu/classSchedule/setupSearchClassSchedule.cfm)