

# MECHANICAL ENGINEERING TECHNOLOGY

## Courses

### MET 1103 Introduction to Mechanical Engineering Technology

**Description:** Introduction to mechanical engineering technology, analytical techniques, and data presentation. Orientation to the mechanical engineering technologist's profession. Previously offered as MPT 1103.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

### MET 1121 Technical Graphics

**Prerequisites:** A grade of "C" or better in ENGR 1332 or ENGR 1322.

**Description:** Visualization of 3-D objects, sketching, manual drafting of engineering drawings to ANSI standards, interpreting typical industrial drawings.

**Credit hours:** 1

**Contact hours:** Lab: 2 Contact: 2

**Levels:** Undergraduate

**Schedule types:** Lab

**Department/School:** Engineering Technology

### MET 1123 Technical Drawing and Basic CAD

**Description:** Sketching, manual drafting and CAD generation of engineering drawings to ANSI standards. Interpreting typical industrial drawings. Students with two years high school or one year practical ANSI drafting/CAD may substitute an advanced course in mechanical engineering technology with consent of their advisers. Previously offered as GENT 1153.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

### MET 2103 Industrial Materials

**Prerequisites:** CHEM 1314 or CHEM 1215 or CHEM 1414.

**Description:** A survey of the properties, characteristics and applications of metals, polymers, ceramics and other industrial materials. Terminology, concepts and principles involved in material selection, specification and processing. Laboratory activities include data collection and report generation, determination of material properties, and evaluation of material characteristics. Previously offered as GENT 1103.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

### MET 2223 Geometric Dimensioning and Tolerancing with Computer-Aided Design

**Prerequisites:** A grade of "C" or better in (GENT 1153 or MET 1123) or a grade of "C" or better in (ENGR 1332 or equivalent) and MET 1121 (can be concurrent enrollment in MET 1121).

**Description:** Theory and application of Geometric Dimensioning and Tolerancing (GD&T) technique. Creation and analysis of tolerances for manufacturing with advanced computer-aided design (CAD) and engineering drawings.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

### MET 2313 Fundamentals of Hydraulic Fluid Power

**Prerequisites:** A grade of "C" or better in ENSC 2113 or GENT 2323.

**Description:** Basic fluid power concepts. Standard hydraulic symbols, component design and application, fluid power system considerations, design and operation. Previously offered as MPT 2313.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

### MET 3003 Dynamics

**Prerequisites:** A grade of "C" or better in GENT 2323 or ENSC 2113.

**Description:** Plane motion of particles and rigid bodies. Force-acceleration, work-energy, and impulse-momentum principles. Graphical analysis, mechanisms and vibrations.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

### MET 3113 Basic Instrumentation

**Prerequisites:** A grade of "C" or better in MATH 2123 or MATH 2144, and PHYS 1214 or PHYS 2114, and GENT 3323 or ENSC 2143, and ENGR 2421.

**Description:** Data analysis. Theory, operational characteristics and application of transducers for measurement of strain, force, velocity, acceleration, displacement, time, frequency, temperature, pressure. Previously offered as MPT 3114.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

### MET 3223 Geometric Dimensioning and Tolerancing

**Prerequisites:** A grade of "C" or better in MET 1123 or ENGR 1332 or equivalent.

**Description:** Theory and Application of Geometric Dimensioning and Tolerancing (GD&T) technique based on ASME Y14.5. Creation, analysis, and inspection of tolerances for manufacturing.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 3313 Applied Fluid Mechanics**

**Prerequisites:** A grade of "C" or better in (MATH 2123 or MATH 2144), (PHYS 1114 or PHYS 2014), and (GENT 2323 or ENSC 2113).

**Description:** Practical analysis of fluid systems including static forces, the Bernoulli and general energy equations, laminar and turbulent flows, measurements of flow and pressure, lift and drag, pumps, and fans. Previously offered as MPT 3313.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 3343 Physical Metallurgy**

**Prerequisites:** A grade of "C" or better in (CHEM 1215 or CHEM 1314 or CHEM 14114 or CHEM 1515).

**Description:** Analysis and evaluation of the properties of metals commonly used in product design. Property change caused by hot and cold working, and by heat treatment. Laboratory activities including metallographic specimen preparation, inspection and testing; and standard tests of tensile properties, hardenability, hardness and toughness. Previously offered as MFGT 3343.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

**MET 3353 Plastics**

**Prerequisites:** A grade of "C" or better in (MET 1123 or ENG 1332) and (MET 3343 or ENSC 3313).

**Description:** The course will provide an overview of commonly used commercial plastics processes. Plastic materials types, additives, polymer flow and physical and mechanical properties. The use of CAE will be used to generate part designs and process simulations.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

**MET 3413 Fundamentals of Pneumatic Fluid Power**

**Prerequisites:** A grade of "C" or better in MET 2313.

**Description:** Basic pneumatics concepts, gas laws, component design and application, system design considerations. Air logic. Previously offered as MPT 2413.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

**MET 3423 Intermediate Hydraulic Fluid Power**

**Prerequisites:** A grade of "C" or better in MET 2313.

**Description:** Review of fundamentals of hydraulic fluid power. Energy-efficient hydraulic systems, cartridge valves, dynamics of hydraulic systems, special topics associated with mobile hydraulic equipment.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

**MET 3433 Basic Thermodynamics**

**Prerequisites:** A grade of "C" or better in (MATH 2123 or MATH 2144) and (PHYS 1114 or PHYS 2014).

**Description:** Basic scientific principles of energy and the behavior of substances as related to engines and systems. Gas laws, vapors and engine cycles. Previously offered as MPT 3433 and GENT 3433.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 3453 Heat Transfer**

**Prerequisites:** A grade of "C" or better in (MATH 2144 or MATH 2123 and (PHYS 2014 or PHYS 1114).

**Description:** Conduction, convection, radiation, condensation and boiling heat transfer. Heat exchangers. Prediction of heat transfer rates. Retardation and enhancement of heat transfer. Course previously offered as MPT 4433 and GENT 4433.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 3543 Manufacturing Processes**

**Prerequisites:** Grade of "C" or better in (MET 1123 or ENG 1332) and (MET 3343 or ENSC 3313).

**Description:** Manufacturing processes used to transform new materials including metals and non-metals into finished goods. Traditional and nontraditional manufacturing processes. Introduction to CAD/CAM. Basic process selection. Meteorology and measurement fundamentals. Previously offered as GENT 1223 and MET 1213.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

**MET 3573 Advanced Production Processes**

**Prerequisites:** Grade "C" or better in (GENT 1223 or MET 1213) and (MET 1223 or MET 2223).

**Description:** Advanced manufacturing and production processes including polymers and plastics, powder metallurgy, foundry, welding and metal forming. Design for assembly (FDA) and design for manufacture (DFM). Previously offered as MFGT 3573.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

**MET 3803 Fundamentals of Mechatronics**

**Prerequisites:** Grade of "C" or better in EET 3104 or EET 2635.

**Description:** Fundamentals of mechatronic systems and components. Different modelling approaches used for mechatronics systems, sensors and actuators, data acquisition and interfacing, signal conditioning, and PLCs. Previously offered as GENT 3503. Same course as EET 3803.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

**MET 4003 Machine Elements**

**Prerequisites:** A grade of "C" or better in (MATH 2133 or MATH 2153) and (GENT 3323 or ENSC 2143).

**Description:** Applications of statics and strength to the design of machine components. Problems of choosing materials, impact and fatigue loading.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 4013 Parametric Computer-Aided Modeling**

**Prerequisites:** A grade of "C" or better in MET 1223.

**Description:** Computer-aided drafting and design using parametric, feature-based solid modeling techniques.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

**MET 4023 Advanced Mechanical Computer-Aided Design**

**Prerequisites:** A grade of "C" or better in MET 1123 or ENGR 1332 or equivalent.

**Description:** Computer-aided design methodologies and processes. State-of-the-art technologies and methodologies in 3D modeling and design processes.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 4033 Applied Vibration and Acoustics**

**Prerequisites:** A grade of "C" or better in GENT 3323 or ENSC 2143.

**Description:** Free and forced vibration of mechanical systems with an emphasis on practical applications. Introduction to sound wave generation and propagation. Mechanical system design methods for noise and vibration mitigation.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 4050 Advanced Mechanical Design**

**Prerequisites:** Junior standing and consent of instructor.

**Description:** Special problems in mechanical engineering technology. Previously offered as MFGT 4050 and MPT 4050. Offered for variable credit, 1-3 credit hours, maximum of 6 credit hours.

**Credit hours:** 1-3

**Contact hours:** Contact: 1-3 Other: 1-3

**Levels:** Undergraduate

**Schedule types:** Independent Study

**Department/School:** Engineering Technology

**MET 4103 Senior Design I**

**Prerequisites:** A grade of "C" or better in (MET 1223 or MET 2223 or MET 3223) and MET 4003.

**Description:** First part of a two semester sequence for the MET capstone project. Focuses on finding and beginning a practical engineering design project. Includes selected topics in engineering design, project management, ethics, and intellectual property.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

**MET 4113 Practical Computational Fluid Dynamics**

**Prerequisites:** A grade of "C" or better in MET 3313 or ENSC 3233.

**Description:** An introduction to the practical use of Computational Fluid Dynamics (CFD) commercial software. Students will be introduced to the concepts governing CFD, but the majority of the class will be utilized in learning the use of a popular commercial code. May not be used for degree credit with MET 5113.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 4123 Senior Design II**

**Prerequisites:** A grade of "C" or better in MET 4103 and ENGL 3323.

Must be taken in the immediately subsequent semester after completing MET 4103.

**Description:** Second part of a two semester sequence for the MET capstone project. Finishes work on the practical engineering design project begun in MET 4103. Includes selected topics in engineering design, project management, ethics, and intellectual property.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

**MET 4133 Interdisciplinary Design I**

**Prerequisites:** A grade of "C" or better in (MET 1223 or MET 2223) and MET 4003 and permission of the instructor.

**Description:** First part of an interdisciplinary capstone project for engineering technology seniors. Conduct mechanical design, prototype development, and project management on practical engineering design project. Same course as MET 4103.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

**MET 4143 Interdisciplinary Design II**

**Prerequisites:** A grade of "C" or better in (MET 1223 or MET 2223) and MET 4003 and permission of the instructor.

**Description:** Second part of an interdisciplinary capstone project for engineering technology seniors. Conduct mechanical design, prototype development, and project management on practical engineering design project. Same course as MET 4123.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

**MET 4173 Additive Manufacturing: Materials, Methods and Applications**

**Prerequisites:** Senior standing or consent of instructor.

**Description:** Theory and practice of additive manufacturing, materials and their applications in various fields. Discuss their applications in product development, data visualization, rapid prototyping, and specialized manufacturing, with special emphasis on direct digital manufacturing.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 4203 Finite Element Methods**

**Prerequisites:** A grade of "C" or better in GENT 3323 or ENSC 2143.

**Description:** Application of Finite Element Methods to machine component design. Problems involving stress, strain, temperature and vibration will be solved using state of the art Finite Element Software. May not be used for degree credit with MET 4203.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 4303 Computer Integrated Manufacturing**

**Prerequisites:** A grade of "C" or better in (GENT 1223 and MET 1213) and (MET 1223 or MET 2223).

**Description:** Introduction to programming techniques and manufacturing applications of computer numerical control (CNC) and robotics. Machine capabilities and tooling requirements with programs being prepared manually and with COMPACT II computer assistance.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

**MET 4313 Electrohydraulics and Motion Control**

**Prerequisites:** Grade of "C" or better in MET 2313 and EET 1114.

**Description:** Principles of electronics as applied to fluid power controls. Trends in modern fluid power systems. Solenoid systems, proportional control, servosystems, programmable controllers, and robotics. Lab includes design, fabrication and operation of practical systems.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

**MET 4413 Ground Source Heat Pump Systems**

**Prerequisites:** GENT 4433 and a grade of "C" or better in MET 3313 and GENT 3433.

**Description:** Design and applications of ground sourced heat pump systems. Heat pump performance, borehole heat transfer, pressure loss calculations and installation methods.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 4453 Applied Thermodynamics**

**Prerequisites:** A grade of "C" or better in ENSC 2213 or GENT 3433.

**Description:** Mixtures, psychrometrics, combustion, heat engine cycles, heat pumps cycles, internal and external combustion engines. Refrigeration. Previously offered as MPT 4453.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 4463 Thermal Fluids Laboratory**

**Prerequisites:** Grade "C" or better in (MET 3313 or ENSC 3233) and (GENT 3433 or MET 3433 or ENSC 2213). Prerequisite or concurrent enrollment in GENT 4433 or MET 4433.

**Description:** Prerequisite or concurrent enrollment in GENT 4433. Experimental study of topics in fluid mechanics, thermodynamics, and heat transfer. Interpretation of experimental data and technical report writing. Previously offered as MPT 4463.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

**MET 4503 Petroleum Operations**

**Prerequisites:** A grade of "C" or better in GENT 2323 or ENSC 2113.

**Description:** An introduction to the petroleum industry and available careers is presented for all engineering technology disciplines. Coverage includes basic petroleum geology, drilling, well completions, producing equipment, field operations, blowout recovery procedures, and transportation of hydrocarbons along the flow path from reservoir to the refinery.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 4713 Internal Ballistics**

**Prerequisites:** "C" or better in (ENSC 2123 or MET 3003) and (ENSC 3233 or MET 3313).

**Description:** This course focuses on the motion of a projectile in the air. Course topics include the vacuum trajectory, ballistic coefficient, aerodynamic forces and moments on the projectile, the point mass trajectory, the Coriolis effect, wind drift, gyroscopic drift, stability of projectiles, interaction between the firearm and the shooter, applications to long-range shooting, and project. May not be used for degree credit with MET 5713.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 4723 External Ballistics**

**Prerequisites:** "C" or better in (ENSC 2123 or MET 3003) and (ENSC 3233 or MET 3313).

**Description:** This course focuses on the motion of a projectile in the air. Course topics include the vacuum trajectory, ballistic coefficient, aerodynamic forces and moments on the projectile, the point mass trajectory, the Coriolis effect, wind drift, gyroscopic drift, stability of projectiles, interaction between the firearm and the shooter, applications to long-range shooting, and project. May not be used for degree credit with MET 5723.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 4733 Terminal Ballistics and Armor**

**Prerequisites:** Grade of "C" or better in (MET 3003 or ENSC 2123) and permission of the instructor.

**Description:** Practical applications of dynamics theories to the mechanical behavior of projectiles and targets at impact. Structural and body armor system design, test, and analyses. May not be used for degree credit with MET 5733.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 4803 Mechatronics System Design**

**Prerequisites:** Grade of "C" or better in GENT 3123 and MET 3803 (can be concurrent enrollment in GENT 3123).

**Description:** Modelling of mechanical, electrical, and hydraulic components. Feedback control systems, electro-hydraulic drives, electrical drives, and microcontroller programming. Previously offered as GENT 4503. Same course as EET 4803.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

**MET 4883 Tool Design**

**Prerequisites:** A grade of "C" or better in MET 2213 and MET 3343.

**Description:** Basic design and development of special tools for processing or manufacturing engineering materials. Design and specification and inspection tools using appropriate techniques of engineering graphics and analysis. Previously offered as MFGT 4883.

**Credit hours:** 3

**Contact hours:** Lecture: 2 Lab: 2 Contact: 4

**Levels:** Undergraduate

**Schedule types:** Lab, Lecture, Combined lecture and lab

**Department/School:** Engineering Technology

**MET 4953 Industrial Assessment and Improvement**

**Prerequisites:** Senior standing and consent of instructor.

**Description:** Plant assessment and improvement-based concepts, strategies, and tools for manufacturing operations. Emphasis is on small to medium-sized manufacturing operations. Issues include energy, water, waste, quality, and productivity analysis across the organization from a systems perspective. Justification of improvement projects and measurement of results. May not be used for degree credit with IEM 4953 or IEM 5953.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 4993 Mechanical Engineering Technology Practice**

**Prerequisites:** Junior standing and consent of department head.

**Description:** Supervised industrial experience in mechanical engineering technology practice with minimal continual duration of eight weeks. Comprehensive journal, written report, and oral presentation.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Undergraduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 5113 Practical Computational Fluid Dynamics**

**Prerequisites:** MET 3313 or ENSC 3233.

**Description:** An introduction to the practical use of Computational Fluid Dynamics (CFD) commercial software. Students will be introduced to the concepts governing CFD, but the majority of the class will be utilized in learning the use of a popular commercial code. May not be used for degree credit with MET 4113.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Graduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 5203 Finite Element Methods**

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Graduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 5713 Internal Ballistics**

**Prerequisites:** Graduate standing.

**Description:** This course is about launching a projectile using a gun barrel. Course topics include solid propellant combustion, design and manufacturing of ammunition, design and manufacturing of barrels, dynamics of bullets inside the barrel, design and dynamics of weapon systems, and project. May not be used for degree credit with MET 4713.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Graduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 5723 External Ballistics**

**Prerequisites:** Graduate standing.

**Description:** This course focuses on the motion of a projectile in the air. Course topics include the vacuum trajectory, ballistic coefficient, aerodynamic forces and moments on the projectile, the point mass trajectory, the Coriolis effect, wind drift, gyroscopic drift, stability of projectiles, interaction between the firearm and the shooter, applications to long-range shooting, and project. May not be used for degree credit with MET 4723.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Graduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology

**MET 5733 Terminal Ballistics and Armor**

**Prerequisites:** Graduate standing.

**Description:** Practical applications of dynamics theories to the mechanical behavior of projectiles and targets at impact. Structural and body armor system design, test, and analyses. May not be used for degree credit with MET 4733.

**Credit hours:** 3

**Contact hours:** Lecture: 3 Contact: 3

**Levels:** Graduate

**Schedule types:** Lecture

**Department/School:** Engineering Technology