MECHANICAL ENGINEERING (MECHENG)

MECHENG 101 Computational Tools for Engineers
2 cr. Undergraduate.
Introduction to the use of spreadsheets and equation solvers. Basic engineering and financial applications using these tools.
Prerequisites: Math 231(C) or 221(C).
Last Taught: Spring 2021, Fall 2020, Spring 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 110 Engineering Fundamentals I
4 cr. Undergraduate.
Introduction to engineering disciplines, problem-solving, visualization, technical communication, and data collection and analysis.
Prerequisites: Math 231(C) or Math 225(C), admis to College of Engineering & Applied Science.
Last Taught: Spring 2021, Fall 2020, Spring 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 111 Engineering Fundamentals II
3 cr. Undergraduate.
Intermediate problem-solving skills, experimentation, technical communication and introduction to engineering design.
Prerequisites: MECHENG 110(P).
Last Taught: Spring 2021, Fall 2020, Spring 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 150 How Things Work: Understanding Technology
3 cr. Undergraduate.
An introductory course that explains the technology that affects our everyday life. Topics include: automobiles, computers, telephone, radio, television, etc.
Prerequisites: none.
General Education Requirements: NS+
Last Taught: Spring 2021, Fall 2020, Spring 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 270 Computer Aided Engineering Laboratory
2 cr. Undergraduate.
Introduction to mechanical design and analysis using parametric CAE tools. Students obtain a foundation in computer-aided design and analysis.
Prerequisites: MECHENG 101(P) and MECHENG 111(P); MATH 231(C) or (P).
Course Rules: Previously MECHENG 370.
Last Taught: Spring 2021, Fall 2020, Spring 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 301 Basic Engineering Thermodynamics
3 cr. Undergraduate.
Basic energy concepts and definitions; First and Second Laws of Thermodynamics; ideal and real gases; thermodynamic properties; introductory cycle analysis.
Prerequisites: Math 233(P) & Physics 209(P).
Last Taught: Spring 2021, Fall 2020, Spring 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 302 Introduction to System Dynamics
3 cr. Undergraduate.
Modeling and analysis of mechanical, electrical, electromechanical, fluid, and combinations thereof; laboratory experiments.
Prerequisites: MECHENG 101(P), PHYSICS 210 (P), and a grade of C or better in ELECENG 234(P) and CIV ENG 202(P).
Last Taught: Fall 2018.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 320 Introduction to Fluid Mechanics
3 cr. Undergraduate.
Basic law of fluid mechanics with applications to engineering problems and with discussion.
Prerequisites: ELECENG 234(P) and PHYSICS 209(P).
Last Taught: Spring 2021, Fall 2020, Spring 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 321 Basic Heat Transfer
4 cr. Undergraduate.
Introduction to conduction, convection and radiation heat transfer; heat exchangers; mass transfer analogies; laboratory experiments.
Prerequisites: jr st; MechEng 301(P).
Last Taught: Spring 2021, Fall 2020, Spring 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 323 Fluid Mechanics Laboratory
1 cr. Undergraduate.
Hands-on experiments involving applications of potential flows, boundary layer flows, gas dynamics, aerodynamics, and fluid power.
Prerequisites: jr st; MechEng 320(P).
Last Taught: Spring 2021, Fall 2020, Spring 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 324 Introduction to Fluid Mechanics
4 cr. Undergraduate.
Introduction to fluid mechanics, fluid statics, integral relations for a control volume, dimensional analysis and similarity, viscous flow in ducts, flow past immersed bodies, open-channel flow, a set of hands-on experiments.
Prerequisites: junior standing, CIV ENG 202(P), ELECENG 234(P), and MECHENG 301(P).
Course Rules: Students who have previously completed both MECHENG 320 and MECHENG 323 may not receive credit for MECHENG 324.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 360 Mechanical Design I
3 cr. Undergraduate.
Kinematic and dynamic analysis of machine members and design applications to linkages, cams, gears, machine balancing and mechanical systems subject to various constraints.
Prerequisites: MechEng 101(P),111(P); & Civ Eng 202(P).
Last Taught: Spring 2021, Fall 2020, Spring 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 364 Advanced Mechanics of Materials and Design of Machine Elements 1
3 cr. Undergraduate.
Design processes, loads and stresses in 3 dimensions, stress and strain relations, 3 dimensional principle stresses, static failure criteria, fatigue failure criteria, and structural stability applied to the design of Machine Elements like shafts.
Prerequisites: CIV ENG 203(P), MATLENG 201(P), MECHENG 110(P), MECHENG 111(P), and MECHENG 302(C).
Course Rules: Students with have previously completed MECHENG 366 may not receive credit for MECHENG 364 and MECHENG 368.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 366 Design of Machine Elements
4 cr. Undergraduate.
Design of mechanical components under steady and fatigue loads. Design of columns, shafts, fasteners, springs, bearings, gearing, etc. Mini-design projects.
Prerequisites: MechEng 101(P),111(P); MatlEng 201(P); & Civ Eng 303(P).
Last Taught: Spring 2021, Fall 2020, Spring 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 368 Design of Machine Elements 2
3 cr. Undergraduate.
Application of static and fatigue failure criterion to the design of machine elements including: mechanical fasteners, fastener patterns, welds and bonding, mechanical springs, bearings, gears, clutches, and brakes.
Prerequisites: MECHENG 364(P).
Course Rules: Students with credit in MECHENG 366 may not receive credit for MECHENG 364 and MECHENG 368.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 379 Introduction to Mechatronics
3 cr. Undergraduate.
Basic electrical circuit analysis. Design and analysis of computer-controlled mechanical systems.
Prerequisites: junior standing and MECHENG 302(C) or (P).
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 402 Thermo-Fluid Engineering
3 cr. Undergraduate.
Analysis and design of systems involving applications of thermodynamics, heat transfer, and fluid mechanics. Applications include heat exchangers, power generation, refrigeration systems, and environmental control.
Prerequisites: MECHENG 321(P) and MECHENG 320(P) or MECHENG 324(P).
Last Taught: Spring 2021, Fall 2020, Spring 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 405 Product Realization
3 cr. Undergraduate/Graduate.
This interdisciplinary course (engineering and art students) considers the diverse aspects of the product realization process.
Prerequisites: jr st & admis to Art & Design prog or IAT prog; or Ind Eng 350(P), 360(P), 370(P); or MechEng 321(P), 360(P), 366(P), 370(P); or grad st & cons instr.
Course Rules: Art 405, MechEng 405, & Ind Eng 405 are jointly offered; they count as repeats of one another.
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 405G Product Realization
3 cr. Undergraduate/Graduate.
This interdisciplinary course (engineering and art students) considers the diverse aspects of the product realization process.
Prerequisites: jr st & admis to Art & Design prog or IAT prog; or Ind Eng 350(P), 360(P), 370(P); or MechEng 321(P), 360(P), 366(P), 370(P); or grad st & cons instr.
Course Rules: Art 405, MechEng 405, & Ind Eng 405 are jointly offered; they count as repeats of one another.
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 411 Heat Transfer
3 cr. Undergraduate/Graduate.
Concepts of heat transfer including conduction, convection, and radiation; steady-state and transient conduction; laminar and turbulent convection; phase changes; black-body and real surface radiation; heat exchangers.
Prerequisites: jr st; MechEng 321(P).
Last Taught: Fall 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 411G Heat Transfer
3 cr. Undergraduate/Graduate.
Concepts of heat transfer including conduction, convection, and radiation; steady-state and transient conduction; laminar and turbulent convection; phase changes; black-body and real surface radiation; heat exchangers.
Prerequisites: jr st; MechEng 321(P).
Last Taught: Fall 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 415 Modern Thermomanufacturing Processes
3 cr. Undergraduate/Graduate.
An introduction to thermal management and techniques applied to chemical vapor deposition, welding, thermal spraying, and machining (cutting and grinding).
Prerequisites: jr st; Civ Eng 303(P), Mecheng 321(P) or equiv, or cons instr.
Last Taught: Spring 2010, Fall 2008.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 415G Modern Thermomanufacturing Processes
3 cr. Undergraduate/Graduate.
An introduction to thermal management and techniques applied to chemical vapor deposition, welding, thermal spraying, and machining (cutting and grinding).
Prerequisites: jr st; Civ Eng 303(P), Mecheng 321(P) or equiv, or cons instr.
Last Taught: Spring 2010, Fall 2008.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 420 Intermediate Fluid Mechanics
3 cr. Undergraduate/Graduate.
Navier-Stokes Equations; CFD package training; Potential Flows; Boundary-Layer Approximation; Turbulent Flows; Porous-Media Flows, Turbomachinery Flows.
Prerequisites: jr st; MechEng 320(P).
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 420G Intermediate Fluid Mechanics
3 cr. Undergraduate/Graduate.
Navier-Stokes Equations; CFD package training; Potential Flows; Boundary-Layer Approximation; Turbulent Flows; Porous-Media Flows, Turbomachinery Flows.
Prerequisites: jr st; MechEng 320(P).
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 423 Applied Fluid Mechanics
3 cr. Undergraduate/Graduate.
Principles of fluid mechanics as applied to elements of fluid machinery, power transmission devices and control systems.
Prerequisites: jr st; MechEng 320 (P).
Last Taught: Fall 2003, Fall 1997.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 423G Applied Fluid Mechanics
3 cr. Undergraduate/Graduate.
Principles of fluid mechanics as applied to elements of fluid machinery, power transmission devices and control systems.
Prerequisites: jr st; MechEng 320 (P).
Last Taught: Fall 2003, Fall 1997.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 425 Aerodynamics of Wind Turbines
3 cr. Undergraduate/Graduate.
Introductory and intermediate wind turbine aerodynamics; wind and wind turbine interaction in energy transmission.
Prerequisites: jr st; MechEng 320(P) or cons instr.
Last Taught: Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 425G Aerodynamics of Wind Turbines
3 cr. Undergraduate/Graduate.
Introductory and intermediate wind turbine aerodynamics; wind and wind turbine interaction in energy transmission.
Prerequisites: jr st; MechEng 320(P) or cons instr.
Last Taught: Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 430 Energy Modeling
3 cr. Undergraduate/Graduate.
Electrical/thermal energy modeling through lectures and hands-on classroom work along with use of energy modeling software.
Prerequisites: jr st; or cons instr.
Course Rules: Jointly offered with and counts as repeat of ElecEng 430.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 430G Energy Modeling
3 cr. Undergraduate/Graduate.
Electrical/thermal energy modeling through lectures and hands-on classroom work along with use of energy modeling software.
Prerequisites: jr st; or cons instr.
Course Rules: Jointly offered with and counts as repeat of ElecEng 430.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 432 Internal Combustion Engines
3 cr. Undergraduate/Graduate.
Thermodynamic principles of internal combustion engines; cycles, combustion, engine operation; carburation, ignition, performance analysis; engine balancing; super charging.
Prerequisites: jr st; MechEng 301 (P).
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 432G Internal Combustion Engines
3 cr. Undergraduate/Graduate.
Thermodynamic principles of internal combustion engines; cycles, combustion, engine operation; carburation, ignition, performance analysis; engine balancing; super charging.
Prerequisites: jr st; MechEng 301 (P).
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 434 Air Conditioning System Design
3 cr. Undergraduate/Graduate.
The design of systems for heating and cooling spaces. Selection and design of central heating, cooling and energy distribution systems.
Prerequisites: jr st; MechEng 321(P), Ind Eng 210(P).
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 434G Air Conditioning System Design
3 cr. Undergraduate/Graduate.
The design of systems for heating and cooling spaces. Selection and design of central heating, cooling and energy distribution systems.
Prerequisites: jr st; MechEng 321(P), Ind Eng 210(P).
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 435 Power Plant Theory and Design
3 cr. Undergraduate/Graduate.
Application of engineering principles to design and analysis of power-production systems. Fossil fuel, nuclear, and gas-turbine power plants. Alternative power generation. Environmental aspects.
Prerequisites: jr st; MechEng 301(P).
Last Taught: Spring 2020, Fall 2018.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 435G Power Plant Theory and Design
3 cr. Undergraduate/Graduate.
Application of engineering principles to design and analysis of power-production systems. Fossil fuel, nuclear, and gas-turbine power plants. Alternative power generation. Environmental aspects.
Prerequisites: jr st; MechEng 301(P).
Last Taught: Spring 2020, Fall 2018.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 436 Solar Engineering
3 cr. Undergraduate/Graduate.
Estimation of energy needs for solar heating and cooling systems for buildings; insolation; solar collector/energy storage design; applications to space heating/cooling, water heating.
Prerequisites: jr st; MechEng 301 (P).
Last Taught: Spring 2016, Fall 2014.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 436G Solar Engineering
3 cr. Undergraduate/Graduate.
Estimation of energy needs for solar heating and cooling systems for buildings; insolation; solar collector/energy storage design; applications to space heating/cooling, water heating.
Prerequisites: jr st; MechEng 301 (P).
Last Taught: Spring 2016, Fall 2014.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 438 Mechanical Engineering Experimentation
3 cr. Undergraduate.
Training and understanding data acquisition systems; experiment planning; sensor calibration; professional report writing and communication; industrial projects.
Prerequisites: IND ENG 369(P); MECHENG 302(P), MECHENG 360(P), and MECHENG 368(C).
Last Taught: Spring 2021, Fall 2020, Spring 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 451 Applied Optics in Engineering
3 cr. Undergraduate/Graduate.
Principles of geometric and physical optics. Introduction to lasers. Topics from current engineering uses of optics, including measurement systems and laser machining.
Prerequisites: sr st; Physics 210(P) or cons instr.
Last Taught: Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 451G Applied Optics in Engineering
3 cr. Undergraduate/Graduate.
Principles of geometric and physical optics. Introduction to lasers. Topics from current engineering uses of optics, including measurement systems and laser machining.
Prerequisites: sr st; Physics 210(P) or cons instr.
Last Taught: Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 453 Design Thinking Studio
3 cr. Undergraduate.
This is an interdisciplinary course that will introduce students to a designer¿s mindset and will foster key design abilities in an experiential learning environment.
Prerequisites: none.
Course Rules: Counts as a repeat of MECHENG 490 with similar topic.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 455 Processing of Plastics
3 cr. Undergraduate/Graduate.
Description of plastics as polymers and polymer composites. Study of various technologies to manufacture plastics. Analytical description of flow and heat transfer in polymers.
Prerequisites: MechEng 320(P) & 321(P).
Last Taught: Fall 2016, Spring 2015.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 455G Processing of Plastics
3 cr. Undergraduate/Graduate.
Description of plastics as polymers and polymer composites. Study of various technologies to manufacture plastics. Analytical description of flow and heat transfer in polymers.
Prerequisites: MechEng 320(P) & 321(P).
Last Taught: Fall 2016, Spring 2015.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 456 Metal Casting Engineering
3 cr. Undergraduate/Graduate.
Pattern and core design; molding technology; pouring and feeding castings; metallurgy of cast engineering alloys and their foundry practice; casting design.
Prerequisites: jr st; MatlEng 201(P).
Course Rules: MechEng 456 and MatlEng 456(421) are jointly offered; they count as repeats of one another.
Last Taught: Fall 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 456G Metal Casting Engineering
3 cr. Undergraduate/Graduate.
Pattern and core design; molding technology; pouring and feeding castings; metallurgy of cast engineering alloys and their foundry practice; casting design.
Prerequisites: jr st; MatlEng 201(P).
Course Rules: MechEng 456 and MatlEng 456(421) are jointly offered; they count as repeats of one another.
Last Taught: Fall 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 457 Engineering Composites
3 cr. Undergraduate/Graduate.
Study of the structure-property relationships in composite materials. Properties of fibers and other reinforcements. Metal, polymer and ceramic matrix composites.
Prerequisites: jr st; MatlEng 201(P).
Course Rules: MechEng 457 and MatlEng 457(455) are jointly offered; they count as repeats of one another.
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 457G Engineering Composites
3 cr. Undergraduate/Graduate.
Study of the structure-property relationships in composite materials. Properties of fibers and other reinforcements. Metal, polymer and ceramic matrix composites.
Prerequisites: jr st; MatlEng 201(P).
Course Rules: MechEng 457 and MatlEng 457(455) are jointly offered; they count as repeats of one another.
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 460 Nanomaterials and Nanomanufacturing
3 cr. Undergraduate/Graduate.
Structure, properties, processing and manufacture of nanoparticles, nanotubes, nanofibers, bulk nanomaterials, nanocomposites including polymer, metal, ceramic, natural and biocomposites; nanofluidics, nanorheology, nanomachines, and nanotribology.
Prerequisites: jr st; MatlEng 201(P).
Course Rules: MechEng 460 & MatlEng 460 are jointly offered; they count as repeats of each other.
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 460G Nanomaterials and Nanomanufacturing
3 cr. Undergraduate/Graduate.
Structure, properties, processing and manufacture of nanoparticles, nanotubes, nanofibers, bulk nanomaterials, nanocomposites including polymer, metal, ceramic, natural and biocomposites; nanofluidics, nanorheology, nanomachines, and nanotribology.
Prerequisites: jr st; MatlEng 201(P).
Course Rules: MechEng 460 & MatlEng 460 are jointly offered; they count as repeats of each other.
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 462 Intermediate Design of Machinery
3 cr. Undergraduate/Graduate.
Consideration of complicated loadings and combined stresses. Design against fatigue. Design and analysis of machine systems. Consideration of special topics in machine element design.
Prerequisites: jr st; MechEng 366(P).
Last Taught: Spring 2020, Spring 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 462G Intermediate Design of Machinery
3 cr. Undergraduate/Graduate.
Consideration of complicated loadings and combined stresses. Design against fatigue. Design and analysis of machine systems. Consideration of special topics in machine element design.
Prerequisites: jr st; MechEng 366(P).
Last Taught: Spring 2020, Spring 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 463 Introduction to Finite Elements
3 cr. Undergraduate/Graduate.
Generation and assembly of finite element matrices in one- and two-dimensional problems. Modeling and practical applications in solid mechanics, heat transfer and fluid flow.
Prerequisites: junior standing; CIV ENG 203(P), CIV ENG 303(P), or ELECENG 234(P); and MECHENG 311(C), MECHENG 320(C), or MECHENG 321(C).
Course Rules: CIV ENG 463 and MECHENG 462 are jointly offered and count as repeats of one another.
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 463G Introduction to Finite Elements
3 cr. Undergraduate/Graduate.
Generation and assembly of finite element matrices in one- and two-dimensional problems. Modeling and practical applications in solid mechanics, heat transfer and fluid flow.
Prerequisites: junior standing; CIV ENG 203(P), CIV ENG 303(P), or ELECENG 234(P); and MECHENG 311(C), MECHENG 320(C), or MECHENG 321(C).
Course Rules: CIV ENG 463 and MECHENG 462 are jointly offered and count as repeats of one another.
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 465 Friction and Wear
3 cr. Undergraduate/Graduate.
Friction and wear of engineering materials. Effect of environment, surface interactions, lubrication, and material properties. Techniques of analysis and measurement.
Prerequisites: jr st; MatlEng 201(P).
Course Rules: Not open to students who have cr in MatlEng 465, which is identical to MechEng 465.
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 465G Friction and Wear
3 cr. Undergraduate/Graduate.
Friction and wear of engineering materials. Effect of environment, surface interactions, lubrication, and material properties. Techniques of analysis and measurement.
Prerequisites: jr st; MatlEng 201(P).
Course Rules: Not open to students who have cr in MatlEng 465, which is identical to MechEng 465.
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 466 Mechanics of Composite Materials
3 cr. Undergraduate/Graduate.
Basic concepts, materials, and characteristics of composites. Micromechanics and Macromechanics of Elastic Response. Failure, design and optimization of composite structures.
Prerequisites: junior standing and CIV ENG 203(P) or CIV ENG 303(P).
Course Rules: CIV ENG 466 and MECHENG 466 are jointly offered and count as repeats of one another.
Last Taught: Spring 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 466G Mechanics of Composite Materials
3 cr. Undergraduate/Graduate.
Basic concepts, materials, and characteristics of composites. Micromechanics and Macromechanics of Elastic Response. Failure, design and optimization of composite structures.
Prerequisites: junior standing and CIV ENG 203(P) or CIV ENG 303(P).
Course Rules: CIV ENG 466 and MECHENG 466 are jointly offered and count as repeats of one another.
Last Taught: Spring 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 469 Introduction to Biomechanical Engineering
3 cr. Undergraduate/Graduate.
Mathematical modeling of human body; dynamics of human motion; neuromuscular control human movement; stress analysis of bones and joints; concurrent mechanical problems in medicine.
Prerequisites: Civ Eng 202(P) & 303(P); or cons instr.
Course Rules: MechEng 469 & Civ Eng 469 are jointly offered and count as repeats of one another.
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 469G Introduction to Biomechanical Engineering
3 cr. Undergraduate/Graduate.
Mathematical modeling of human body; dynamics of human motion; neuromuscular control human movement; stress analysis of bones and joints; concurrent mechanical problems in medicine.
Prerequisites: Civ Eng 202(P) & 303(P); or cons instr.
Course Rules: MechEng 469 & Civ Eng 469 are jointly offered and count as repeats of one another.
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 472 Introduction to Wind Energy
3 cr. Undergraduate/Graduate.
Principles of wind turbines; wind characteristics; rotor dynamics of wind turbines; turbine design and integration; controls and electrical systems; grid connection.
Prerequisites: jr st; or cons instr.
Course Rules: MechEng 472 & ElecEng 472 are jointly offered; they count as repeats of one another.
Last Taught: Fall 2016, Fall 2015.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 472G Introduction to Wind Energy
3 cr. Undergraduate/Graduate.
Principles of wind turbines; wind characteristics; rotor dynamics of wind turbines; turbine design and integration; controls and electrical systems; grid connection.
Prerequisites: jr st; or cons instr.
Course Rules: MechEng 472 & ElecEng 472 are jointly offered; they count as repeats of one another.
Last Taught: Fall 2016, Fall 2015.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 473 Applied Dynamics
3 cr. Undergraduate/Graduate.
Application of dynamic principles to a variety of engineering situations. Behavior of particle systems and rigid body motion in space. Analysis of traffic accidents, shock machines, rockets and satellites, missiles and projectiles, dynamic balancing, gyroscopes and intertial navigation.
Prerequisites: jr st & Civ Eng 202(P).
Last Taught: Spring 2019, Spring 2018.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 473G Applied Dynamics
3 cr. Undergraduate/Graduate.
Application of dynamic principles to a variety of engineering situations. Behavior of particle systems and rigid body motion in space. Analysis of traffic accidents, shock machines, rockets and satellites, missiles and projectiles, dynamic balancing, gyroscopes and intertial navigation.
Prerequisites: jr st & Civ Eng 202(P).
Last Taught: Spring 2019, Spring 2018.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 474 Introduction to Control Systems
4 cr. Undergraduate/Graduate.
Modeling of continuous systems; stability considerations, analysis and design of feedback control systems in time and frequency domains.
Prerequisites: sr st; ElecEng 301(P); a grade of C or better in ElecEng 234(P) & Civ Eng 202(P).
Last Taught: Spring 2021, Fall 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 474G Introduction to Control Systems
4 cr. Undergraduate/Graduate.
Modeling of continuous systems; stability considerations, analysis and design of feedback control systems in time and frequency domains.
Prerequisites: sr st; ElecEng 301(P); a grade of C or better in ElecEng 234(P) & Civ Eng 202(P).
Last Taught: Spring 2021, Fall 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 475 Vibrations in Mechanical Design
3 cr. Undergraduate/Graduate.
Integrated treatment of mathematical modeling and analysis of mechanical systems, analysis of vibrations and performance under different loading conditions.
Prerequisites: sr st; Civ Eng 202(P), ElecEng 234(P).
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 475G Vibrations in Mechanical Design
3 cr. Undergraduate/Graduate.
Integrated treatment of mathematical modeling and analysis of mechanical systems, analysis of vibrations and performance under different loading conditions.
Prerequisites: sr st; Civ Eng 202(P), ElecEng 234(P).
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 476 Introduction to Robotics
3 cr. Undergraduate/Graduate.
Fundamentals of manipulators, sensors, actuators, end-effectors and product design for automation, computer vision and pattern recognition.
Prerequisites: ElecEng 234(P), MechEng 360(P).
Last Taught: Spring 2020, Spring 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 476G Introduction to Robotics
3 cr. Undergraduate/Graduate.
Fundamentals of manipulators, sensors, actuators, end-effectors and product design for automation, computer vision and pattern recognition.
Prerequisites: ElecEng 234(P), MechEng 360(P).
Last Taught: Spring 2020, Spring 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 479 Advanced Mechatronics
3 cr. Undergraduate/Graduate.
Semiconductor electronics; embedded programming; sensor instrumentation; digital and analog electronics; filtering, actuators; advanced communication protocols; wireless communications; mobile robot modeling for mechatronics application; design, development and feedback control of a mechatronic system.
Prerequisites: senior standing or consent of instructor;
MECHENG 379(P).
Last Taught: Summer 2021, Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 479G Advanced Mechatronics
3 cr. Undergraduate/Graduate.
Semiconductor electronics; embedded programming; sensor instrumentation; digital and analog electronics; filtering, actuators; advanced communication protocols; wireless communications; mobile robot modeling for mechatronics application; design, development and feedback control of a mechatronic system.
Prerequisites: senior standing or consent of instructor; MECHENG 379(P).
Last Taught: Summer 2021, Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 490 Topics in Mechanical Engineering:
1-3 cr. Undergraduate/Graduate.
Recent theoretical and applied topics in mechanical engineering.
Prerequisites: jr st & cons instr.
Course Rules: May be retaken with change in topic to max of 9 cr.
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 490G Topics in Mechanical Engineering:
1-3 cr. Undergraduate/Graduate.
Recent theoretical and applied topics in mechanical engineering.
Prerequisites: jr st & cons instr.
Course Rules: May be retaken with change in topic to max of 9 cr.
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 496 Senior Design Project
3 cr. Undergraduate.
Engineering design project in a simulated industrial environment. Student design team works on a problem in collaboration with college faculty and vendors. Formal report writing.
Prerequisites: MECHENG 270(P), MECHENG 321(P), MECHENG 360(P), and MECHENG 368(C).
Last Taught: Spring 2021, Fall 2020, Spring 2020, Fall 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 542 Introduction to Technology Entrepreneurship
3 cr. Undergraduate.
Introductory concepts related to technology entrepreneurship including opportunity identification, analysis and new venture planning. Prepares students to recognize and pursue viable technology-based entrepreneurial opportunities.
Prerequisites: jr st & admis to Tech Entrep Cert program or admis to business or engineering major.
Course Rules: Counts as repeat of Bus Adm 495 or Mech Eng 490 with same topic. Jointly offered with & counts as repeat of Bus Adm 542.
Last Taught: Fall 2014.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 543 Introduction to Technology Management and Innovation
3 cr. Undergraduate.
Introductory concepts related to technology management and technological innovation. Prepares students to evaluate and plan technology commercialization projects.
Prerequisites: jr st & admis to Tech Entrep Cert program or admis to business or engineering major.
Course Rules: Counts as repeat of Bus Adm 495 with same topic. Jointly offered with & counts as repeat of Bus Adm 543.
Last Taught: Fall 2014.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 544 New Product Development
3 cr. Undergraduate/Graduate.
Concepts related to product development including product concept development and testing, and product design. Prepares students to work in cross-functional product development teams.
Prerequisites: jr st & admis to Tech Entrep Cert program or Bus Adm major or CEAS major; or grad st. & admis to business or engineering program or admis to Tech Entrep Cert program.
Course Rules: Counts as repeat of Bus Adm 795 with same topic; Jointly offered with & counts as repeat of Bus Adm 544.
Last Taught: Spring 2016, Spring 2015.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 544G New Product Development
3 cr. Undergraduate/Graduate.
Concepts related to product development including product concept development and testing, and product design. Prepares students to work in cross-functional product development teams.
Prerequisites: jr st & admis to Tech Entrep Cert program or Bus Adm major or CEAS major; or grad st. & admis to business or engineering program or admis to Tech Entrep Cert program.
Course Rules: Counts as repeat of Bus Adm 795 with same topic; Jointly offered with & counts as repeat of Bus Adm 544.
Last Taught: Spring 2016, Spring 2015.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 546 Global Innovation Management
3 cr. Undergraduate/Graduate.
Concepts related to collaborative innovation in global networks including diverse collaboration models, innovation processes, and capabilities. Prepares students to manage global collaborative innovation projects.
Prerequisites: jr st & admis to Tech Entrep Cert program or Bus Adm major or CEAS major; or grad st. & admis to business or engineering program or admis to Tech Entrep Cert program.
Course Rules: Counts as repeat of Bus Adm 795 with same topic. Jointly offered with & counts as repeat of Bus Adm 546.
Last Taught: Spring 2016.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 546G Global Innovation Management
3 cr. Undergraduate/Graduate.
Concepts related to collaborative innovation in global networks including diverse collaboration models, innovation processes, and capabilities. Prepares students to manage global collaborative innovation projects.
Prerequisites: jr st & admis to Tech Entrep Cert program or Bus Adm major or CEAS major; or grad st. & admis to business or engineering program or admis to Tech Entrep Cert program.
Course Rules: Counts as repeat of Bus Adm 795 with same topic. Jointly offered with & counts as repeat of Bus Adm 546.
Last Taught: Spring 2016.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 548 Technology Venturing Project
3 cr. Undergraduate.
A capstone course for students to demonstrate their knowledge and skills related to technology/product commercialization. Prepares students to lead their (or corporate) technology ventures.
Prerequisites: jr st & admis to Tech Entrep Cert program or admis to business or engineering major; Bus Adm/Mech Eng 542(P).
Course Rules: Jointly offered with & counts as repeat of Bus Adm 548.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 574 Intermediate Control Systems
3 cr. Undergraduate/Graduate.
State space; frequency domain methods of modeling, analysis and design of control systems; digital control; and multivariate systems.
Prerequisites: sr st; Mecheng 474(P) or ElecEng 474(402)(P); or grad st.
Course Rules: ElecEng 574(503) & MechEng 574(478) are jointly offered & count as repeats of each other. Not open for cr to students who have cr in ElecEng 503(ER) or MechEng 503(ER).
Last Taught: Spring 2020, Spring 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 574G Intermediate Control Systems
3 cr. Undergraduate/Graduate.
State space; frequency domain methods of modeling, analysis and design of control systems; digital control; and multivariate systems.
Prerequisites: sr st; Mecheng 474(P) or ElecEng 474(402)(P); or grad st.
Course Rules: ElecEng 574(503) & MechEng 574(478) are jointly offered & count as repeats of each other. Not open for cr to students who have cr in ElecEng 503(ER) or MechEng 503(ER).
Last Taught: Spring 2020, Spring 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 584 Biodynamics of Human Motion
3 cr. Undergraduate/Graduate.
Techniques for collecting, analyzing and interpreting human motion data. Special emphasis will be placed on performing data analysis using the software package, Matlab.
Prerequisites: jr st; ElecEng 234(P); Civ Eng 202(C).
Last Taught: Spring 2013, Spring 2012.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 584G Biodynamics of Human Motion
3 cr. Undergraduate/Graduate.
Techniques for collecting, analyzing and interpreting human motion data. Special emphasis will be placed on performing data analysis using the software package, Matlab.
Prerequisites: jr st; ElecEng 234(P); Civ Eng 202(C).
Last Taught: Spring 2013, Spring 2012.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 699 Independent Study
1-3 cr. Undergraduate/Graduate.
Prerequisites: jr st; cons instr.
Course Rules: Limited to max of 6 cr applied toward undergrad degree.
Last Taught: Spring 2021, Fall 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 699G Independent Study
1-3 cr. Undergraduate/Graduate.
Prerequisites: jr st; cons instr.
Course Rules: Limited to max of 6 cr applied toward undergrad degree.
Last Taught: Spring 2021, Fall 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 700 CEAS Graduate Seminar
1-3 cr. Graduate.
Seminar in professional ethics, oral and written communication, contemporary social issues, career development, time management, and laboratory safety.
Prerequisites: grad st
Course Rules: Civ Eng 700, CompSci 700, ElecEng 700, Ind Eng 700, MatlEng 700 & MechEng 700 are jointly offered and count as repeats of one another
Last Taught: Fall 2020, Spring 2020, Fall 2019, Spring 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 701 Advanced Linear System Analysis
3 cr. Graduate.
Theory and analysis of linear dynamic systems; discrete and continuous state models; linear algebra for dynamic systems; state transition matrix, numerical methods; and applications.
Prerequisites: grad st.
Course Rules: ElecEng 701 & MechEng 701 are jointly offered and count as repeats of one another.
Last Taught: Fall 2020, Fall 2018, Fall 2016, Fall 2015.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 702 Advanced Engineering Thermodynamics
3 cr. Graduate.
Laws of thermodynamics, property relations, equations of state; introduction to statistical and irreversible thermodynamics; applications to perfect gases, perfect crystals, and homogeneous solutions.
Prerequisites: grad st; Mecheng 301(P) & 321(P) or equiv.
Last Taught: Fall 2020, Spring 2019, Spring 2018, Spring 2017.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 703 Principles of Combustion
3 cr. Graduate.
Chemical kinetics and thermodynamics, conservation equations for multicomponent reacting systems, detonation, premix, diffusion and turbulent flames.
Prerequisites: grad st; MechEng 302(P) & 321(P) or equiv.
Last Taught: Fall 2020, Fall 2018, Spring 2004, Spring 2002.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 706 Continuum Mechanics
3 cr. Graduate.
Basic concepts of the continuum models used in the various fields of mechanics including fluid mechanics, rheology, elasticity, fracture mechanics, and plasticity.
Prerequisites: grad st.
Last Taught: Spring 2018.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 707 Transport in Porous Media
3 cr. Graduate.
Introduction to fluid mechanics in porous media, single- and multi-phase flows, volume averaged transport equations, convection heat transfer, consolidating porous media, volume averaging theory, applications.
Prerequisites: grad st.
Last Taught: Spring 2020, Fall 2017, Spring 2016, Spring 2013.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 710 Advanced Transport Processes
2 cr. Graduate.
Vector and tensor analysis of practical engineering problems; basic laws of mass, momentum and energy transport; transport phenomena in porous media reacting and non-reaction media.
Prerequisites: MechEng 321(P) or equiv.
Last Taught: Spring 2020, Spring 2018, Fall 2016, Fall 2014.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 711 Thermal Radiation and Conduction
3 cr. Graduate.
Radiative properties of and radiative transfer in absorbing, emitting and scattering media; transient and steady state heat conduction; multi-mode heat transfer applications.
Prerequisites: grad st; MechEng 311(P) or 321(P).
Last Taught: Fall 2020, Fall 2018, Fall 2014, Spring 2013.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 712 Convection Heat and Mass Transfer
3 cr. Graduate.
Conservation equations; laminar developed and developing flows; laminar boundary layers; high speed flows; turbulent flow and heat transfer; natural convection; mass transfer; special engineering applications.
Prerequisites: grad st; MechEng 311(P) or 321(P).
Last Taught: Spring 2019, Fall 2016, Spring 2015, Fall 2013.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 714 Energy Transport in Microscale Systems
3 cr. Graduate.
Introducing thermophysics of microscale systems including statistical, non-equilibrium thermodynamics, particle transport theory, energy carriers in different materials and phases, and applications including mems and nanotechnology.
Prerequisites: grad st; Mecheng 320(P) & 321(P).
Last Taught: Fall 2001.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 715 Numerical Methods in Engineering
3 cr. Graduate.
Differential equation solutions with finite difference and finite volume methods; grid generation technique; finite element methods; applications to solid mechanics, heat transfer, and fluid mechanics.
Prerequisites: grad st; Math 413(P) or cons instr.
Last Taught: Fall 2020, Fall 2019, Spring 2018, Spring 2017.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 718 Nonlinear Control Systems
3 cr. Graduate.
Advanced concepts and methodologies in modeling and design of nonlinear control systems. Lyapunov theory; describing functions; variable structure control.
Prerequisites: grad st; ElecEng or MechEng474(P) or equiv; ElecEng or MechEng 701(P); or cons instr.
Course Rules: ElecEng 718 & MechEng718 are jointly offered and count as repeats of one another. Not open for credit to students w/ cr in MechEng 778.
Last Taught: Fall 2016, Fall 2010, Spring 2007, Fall 2001.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 721 Fundamentals of Fluid Flow
3 cr. Graduate.
Inviscid, viscous and compressible flow; potential flow in aerodynamics; analytical solutions of navier-stokes equation; laminar and turbulent boundary layers, jets, wakes, and separating flows; applications.
Prerequisites: grad st; Mecheng 320(P).
Last Taught: Spring 2021, Fall 2018, Fall 2017, Spring 2016.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 722 Advanced Fluid Mechanics
3 cr. Graduate.
Formulations of navier-stokes and energy equations; turbulence models; solutions to wall, free shear layer, and recirculating flows; turbulence energy spectrum; applications to industrial problems.
Prerequisites: grad st; MechEng 320(P).
Last Taught: Spring 2019, Fall 2016, Spring 2015, Spring 2012.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 723 Computational Fluid Dynamics and Heat Transfer
3 cr. Graduate.
Finite difference methods for solving boundary layer equations, navier-stokes equations, etc. Laminar and turbulent flows.
Prerequisites: grad st; cons instr.
Last Taught: Spring 2017, Fall 2015, Spring 2009, Spring 2007.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 725 Fluid Power and Turbomachinery
2 cr. Graduate.
Concept of hydraulic systems; hydraulic motors; valves; hydraulic circuits; pneumatic systems; axial and radial gas turbines, pumps, compressors; steam turbines; hydraulic turbines; wind turbines.
Prerequisites: grad st; MechEng 320(P).
Last Taught: Spring 2021, Spring 2019, Fall 2017, Spring 2016.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 726 Mechanical Vibrations
3 cr. Graduate.
Free and forced vibrations of multiple degree of freedom systems using modern matrix methods.
Prerequisites: grad st; Mecheng 475(R) or equiv.
Course Rules: Not open to students who have cr in Civ Eng 726 which is identical to Mecheng 726.
Last Taught: Fall 2020, Spring 2019, Spring 2015, Spring 2013.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 732 Solidification Processing
3 cr. Graduate.
Solidification phenomena and its engineering application to metals, semiconductors, ceramics, properties of cast products. Foundry processes.
Prerequisites: grad st; MatlEng 330(P).
Course Rules: MechEng 732 and MatlEng 732 are jointly offered; they count as repeats of each other.
Last Taught: Fall 2018, Fall 2016.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 733 Sensors and Systems
3 cr. Graduate.
Physical principles and working of sensors, interfacing, and sensor networks.
Prerequisites: grad st; ElecEng 305 or cons. instr.; Jointly offered with & Counts as repeat of BME 733 & ElecEng 733.
Last Taught: Fall 2020, Fall 2019, Fall 2018, Fall 2017.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 760 Dynamic Problems in Design
3 cr. Graduate.
Analytical methods for solution of typical vibrating and balancing problems encountered in mechanical systems. Special emphasis on methods of suppression and control.
Prerequisites: grad st; MechEng 360(P).
Last Taught: Fall 2019, Fall 2017, Spring 2016, Spring 2014.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 762 Mechanical Systems Analysis
3 cr. Graduate.
An integrated treatment of mathematical modeling and analysis of mechanical systems. Modeling of machine elements and systems; performance under transient, periodic and random loads.
Prerequisites: grad st; MechEng 365(P).
Last Taught: Spring 2002, Fall 2000, Spring 1999, Fall 1997.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 765 Mechanical Reliability and Probabilistic Design
3 cr. Graduate.
Advanced design theory and methodology incorporating probabilistic and statistical concepts. Design of mechanical and structural members for specific reliability and confidence level. Case histories and applications.
Prerequisites: grad st; MechEng 360(P) & 365(P); or cons instr.
Last Taught: Spring 2021, Spring 2020, Spring 2016, Fall 2014.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 773 Advanced Dynamics
3 cr. Graduate.
General theory of dynamic behavior from the viewpoint of Lagrangian and Hamiltonian mechanics. Application of energy principles to dynamical analysis of mechanical systems.
Prerequisites: grad st; MechEng 580(P) or Civ Eng 580(P); or cons instr.
Course Rules: Not open to students who have cr in Civ Eng 773, which is identical.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 785 Optimization Methods in Engineering
3 cr. Graduate.
Optimization as engineering design tool; nonlinear programming; computational techniques for unconstrained and constrained problems; conjugate gradient, sumt, reduced gradient, feasible directions methods; design applications.
Prerequisites: grad st; ElecEng 234(P), CompSci 151(P) or equiv.
Course Rules: Not open to students who have cr in Ind Eng 785 which is identical to MechEng 785.
Last Taught: Fall 2020, Fall 2019, Fall 2018, Fall 2016.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 816 Optimal Control Theory
3 cr. Graduate.
Analysis and synthesis of discrete and continuous optimal control systems; linear quadratic regulators; dynamic programming and variational methods; applications.
Prerequisites: grad st; ElecEng or MechEng474(P) or equiv; ElecEng or MechEng 701(P); or cons instr.
Course Rules: ElecEng 816 & MechEng 816 are jointly offered and count as repeats of one another.
Last Taught: Spring 2017, Spring 2011, Fall 2008, Spring 2006.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 819 Adaptive Control Theory
3 cr. Graduate.
Adaptive control systems including mathematical foundations, estimation, model reference adaptive control, self tuning regulators, numerical methods, applications.
Prerequisites: grad st; ElecEng or MechEng474(P) or equiv; ElecEng or MechEng 701(P); or cons instr.
Course Rules: ElecEng 819 & MechEng 819 are jointly offered and count as repeats of one another.
Last Taught: Fall 2018, Spring 2014, Spring 2009, Fall 2007.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 880 Bioengineering Seminar
1 cr. Graduate.
Presentations by bioengineering affiliated faculty, invited speakers, and graduate students.
Prerequisites: grad st
Course Rules: MechEng 880, ElecEng 880, CompSci 880, MatlEng 880, Ind Eng 880 & Civ Eng 880 are jointly offered and count as repeats of one another. May be repeated to 3 cr. max.
Last Taught: Spring 2017, Fall 2016, Spring 2016, Fall 2015.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 888 Candidate for Degree
0 cr. Graduate.
Available for graduate students who must meet minimum credit load requirement.
Prerequisites: graduate standing.
Course Rules: Fee for 1 cr assessed; unit does not count towards credit load for Fin Aid. Repeatable. Satisfactory/Unsatisfactory only.
Last Taught: Summer 2019, Fall 2018, Summer 2017, Summer 2016.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 890 Advanced Topics in Mechanical Engineering:
1-3 cr. Graduate.
Recent theoretical and applied developments in mechanical engineering. Topics selected from areas in thermal-fluid engineering, machine design and controls, and chemical process engineering.
Prerequisites: grad st; cons instr.
Course Rules: May be repeated with change in topic to max of 9 cr.
Last Taught: Spring 2021, Fall 2020, Spring 2018, Fall 2017.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 990 Masters Thesis
1-9 cr. Graduate.
Prerequisites: grad st; cons instr.
Last Taught: Summer 2021, Spring 2021, Fall 2020, Summer 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 998 Doctoral Thesis
1-12 cr. Graduate.
Prerequisites: grad st; cons instr & grad prog comm.
Last Taught: Summer 2021, Spring 2021, Fall 2020, Summer 2020.
Current Offerings: https://catalog.uwm.edu/course-search/

MECHENG 999 Advanced Independent Study
1-3 cr. Graduate.
Prerequisites: grad st; cons instr & grad prog committee.
Last Taught: Summer 2021, Spring 2021, Fall 2020, Spring 2020.
Current Offerings: https://catalog.uwm.edu/course-search/