INDUSTRIAL AND MANUFACTURING ENGINEERING (IND ENG)

Industrial and Manufacturing Engineering Courses

IND ENG 111 Introduction to Engineering
3 cr. Undergraduate.
Introduction to Engineering Disciplines, problem solving methods, teamwork, technical communication, professionalism, and ethics.
Prerequisites: none.
Course Rules: Counts as repeat of IND ENG 210.
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 112 Computer-Aided Design
3 cr. Undergraduate.
Visualization, engineering drawing, CAD, group project, and teamwork.
Prerequisites: none.
Course Rules: Counts as repeat of of IND ENG 101.
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 250 Manufacturing Processes
3 cr. Undergraduate.
Broad study of processes and equipment used in modern production. Design considerations, economic factors, automation, metals and plastics processing, fabrication of electronic materials.
Prerequisites: Math Placement Level 20; or a grade of C or better in MATH 94(P), MATH 95(P), or MATH 98(P).
Course Rules: Previously IND ENG 350.
Last Taught: Fall 2020, Fall 2019, Fall 2018, Fall 2017.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 255 Industrial Applications of AI and Machine Learning
3 cr. Undergraduate.
Applications of AI to improve physical processes and operations in the manufacturing, transportation, logistics, and service sectors. Introduction to the main (non-text-based) AI methodologies used in these sectors.
Prerequisites: Math Placement Level 20 or a grade of C or better in MATH 94(P), MATH 95(P), or MATH 98(P).
Course Rules: Counts as a repeat of IND ENG 590 with similar topic.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 267 Data Visualization and Analytics
3 cr. Undergraduate.
Introduction to data-driven decision making: data visualization techniques, telling a story with data, and analyzing data to make better decisions. Managing the 5 Vs of big data: volume, variety, veracity, variability, and velocity.
Prerequisites: none.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 285 Project Management
3 cr. Undergraduate.
Project management fundamentals: the project life cycle, stakeholder management, organizational culture, project initiation and planning, scope, scheduling, resource and budget planning, procurement, quality planning, communication, risk management, implementation, and completion.
Prerequisites: none.
Course Rules: Counts as a repeat of IND ENG 590 with similar topic.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 288 Introduction to Spatial Data Science
3 cr. Undergraduate.
Introduction to the collection, analysis, and visualization of spatial data via geographic information systems (GIS), remote sensing (RS), and global positioning systems (GPS) to facilitate the solution of complex problems.
Prerequisites: none.
Course Rules: Counts as a repeat of IND ENG 590 with similar topic.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 290 Elementary Topics in Systems Design:
1-3 cr. Undergraduate.
Selected topics of current interest in an area of systems-design for freshmen and sophomore students.
Prerequisites: consent of instructor.
Course Rules: Repeatable with change in topic to 9 cr max.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 299 Independent Reading and Work
1-3 cr. Undergraduate.
Credit hours to be arranged between student and staff on an individual basis.
Prerequisites: consent of instructor.
Last Taught: Spring 1994, Spring 1987.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 360 Engineering Economics
3 cr. Undergraduate.
Concept of time value of money. Economical evaluation of alternate projects and replacement policies using methods such as present worth, rate of return, and annual cost. Engineering investment decision analysis.
Prerequisites: sophomore standing; Math Placement Level 20 or a grade of C or better in MATH 94(P), MATH 95(P), or MATH 98(P).
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 367 Engineering Statistics
3 cr. Undergraduate.
Concepts of probability and statistics; probability distributions of engineering applications; sampling distributions; hypothesis testing; parameter estimation; regression analysis; illustrative examples from engineering and biomedical applications.
Prerequisites: a grade of B- or better in MATH 211(P), B- or better in MATH 213(P), C or better in MATH 221(P), or C or better in MATH 231(P).
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 369 Introduction to Probability and Statistical Inference
1 cr. Undergraduate.
Concepts of probability and statistics.
Prerequisites: MATH 221(P) or MATH 231(P).
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 370 Operations Analysis
3 cr. Undergraduate.
Functions and philosophies of the contemporary engineer in the production/service environment as it is planned, designed, manufactured/delivered, maintained, controlled and distributed.
Prerequisites: MATH 231(P).
Last Taught: Fall 2024, Fall 2023, Fall 2022, Fall 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 390 Senior Thesis
1-3 cr. Undergraduate.
Independent research under the direction of a faculty member; submission of a written thesis is required.
Prerequisites: senior standing and consent of instructor.
Course Rules: 3 cr total required. Need not all be taken during the same semester.
Last Taught: Summer 1988, Spring 1987, Fall 1986, Spring 1986.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 420 Work Standardization and Measurement
3 cr. Undergraduate/Graduate.
Organizing machines for producing a simple product. Study of production sequencing, material flow, plant layout; time and motion; and the economics of materials and methods of fabrication. Minimizing production costs within physical, social, aesthetic constraints.
Prerequisites: IND ENG 111(P) and IND ENG 367(P).
Course Rules: Previously IND ENG 470/470G.
Last Taught: Fall 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 420G Work Standardization and Measurement
3 cr. Undergraduate/Graduate.
Organizing machines for producing a simple product. Study of production sequencing, material flow, plant layout; time and motion; and the economics of materials and methods of fabrication. Minimizing production costs within physical, social, aesthetic constraints.
Prerequisites: IND ENG 111(P) and IND ENG 367(P).
Course Rules: Previously IND ENG 470/470G.
Last Taught: Fall 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 455 Applied Mathematical Optimization
3 cr. Undergraduate/Graduate.
Introduction to fundamental optimization methods: linear programming, network optimization, and integer programming methods of operations research. Modeling and application of these methods in practical situations.
Prerequisites: junior standing and MATH 232(P); or graduate standing.
Last Taught: Fall 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 455G Applied Mathematical Optimization
3 cr. Undergraduate/Graduate.
Introduction to fundamental optimization methods: linear programming, network optimization, and integer programming methods of operations research. Modeling and application of these methods in practical situations.
Prerequisites: junior standing and MATH 232(P); or graduate standing.
Last Taught: Fall 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 465 Optimization Under Uncertainty
3 cr. Undergraduate/Graduate.
Concepts and methods of probabilistic modeling in queueing, forecasting, and inventory problems for design and analysis of manufacturing and service operations.
Prerequisites: junior standing; IND ENG 367(P), MTHSTAT 361(P) or equivalent course in statistics; and IND ENG 370(P).
Last Taught: Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 465G Optimization Under Uncertainty
3 cr. Undergraduate/Graduate.
Concepts and methods of probabilistic modeling in queueing, forecasting, and inventory problems for design and analysis of manufacturing and service operations.
Prerequisites: junior standing; IND ENG 367(P), MTHSTAT 361(P) or equivalent course in statistics; and IND ENG 370(P).
Last Taught: Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 475 Computer Simulation
3 cr. Undergraduate/Graduate.
Fundamentals of discrete-event simulation. Random number and random variable generation for simulation modeling and analysis using simulation software.
Prerequisites: IND ENG 367(P) and concurrent enrollment in one of the following: COMPSCI 151(C), COMPSCI 202(C), COMPSCI 240(C), or COMPSCI 250(C).
Last Taught: Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 475G Computer Simulation
3 cr. Undergraduate/Graduate.
Fundamentals of discrete-event simulation. Random number and random variable generation for simulation modeling and analysis using simulation software.
Prerequisites: IND ENG 367(P) and concurrent enrollment in one of the following: COMPSCI 151(C), COMPSCI 202(C), COMPSCI 240(C), or COMPSCI 250(C).
Last Taught: Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 499 Ad Hoc:
1-12 cr. Undergraduate.
Course created expressly for offering in a specified enrollment period.
Prerequisites: consent of instructor; additional prerequisites may be assigned to specific topics.
Course Rules: Requires department and associate dean approval. In exceptional circumstances, can be offered in one additional term. May be retaken with change in topic.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 540 Foundations of Systems Engineering
3 cr. Undergraduate/Graduate.
Fundamental concepts of systems engineering to provide students with basic knowledge to facilitate the transformation of operational needs into a well-defined system.
Prerequisites: junior standing; Math Placement Level 30 or C or better in MATH 105(P), MATH 108(P), or MATH 116(P).
Last Taught: Fall 2004, Spring 1998.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 540G Foundations of Systems Engineering
3 cr. Undergraduate/Graduate.
Fundamental concepts of systems engineering to provide students with basic knowledge to facilitate the transformation of operational needs into a well-defined system.
Prerequisites: junior standing; Math Placement Level 30 or C or better in MATH 105(P), MATH 108(P), or MATH 116(P).
Last Taught: Fall 2004, Spring 1998.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 550 Control of Automated Manufacturing Systems
3 cr. Undergraduate/Graduate.
Theoretical and practical skills to design and control automated manufacturing systems and industrial processes through science-based theoretical advancements and state-of-the-art industrial applications.
Prerequisites: junior standing and ELECENG 301(P).
Last Taught: Fall 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 550G Control of Automated Manufacturing Systems
3 cr. Undergraduate/Graduate.
Theoretical and practical skills to design and control automated manufacturing systems and industrial processes through science-based theoretical advancements and state-of-the-art industrial applications.
Prerequisites: junior standing and ELECENG 301(P).
Last Taught: Fall 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 555 Manufacturing Systems Integration
3 cr. Undergraduate/Graduate.
Integration and interfacing of computerized manufacturing systems, programmable logic controllers and sequential programming, sensor implementation strategies, automated fixturing and robotic workcell creation.
Prerequisites: IND ENG 540(P).
Last Taught: Spring 2004, Spring 2002.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 555G Manufacturing Systems Integration
3 cr. Undergraduate/Graduate.
Integration and interfacing of computerized manufacturing systems, programmable logic controllers and sequential programming, sensor implementation strategies, automated fixturing and robotic workcell creation.
Prerequisites: IND ENG 540(P).
Last Taught: Spring 2004, Spring 2002.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 571 Quality Assurance
3 cr. Undergraduate/Graduate.
Statistical process quality design and control. Process control charts, six sigma and process capability assessment.
Prerequisites: junior standing and IND ENG 367(P), or equivalent course in statistics; or graduate standing.
Last Taught: Spring 2025, Spring 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 571G Quality Assurance
3 cr. Undergraduate/Graduate.
Statistical process quality design and control. Process control charts, six sigma and process capability assessment.
Prerequisites: junior standing and IND ENG 367(P), or equivalent course in statistics; or graduate standing.
Last Taught: Spring 2025, Spring 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 572 Reliability Engineering
3 cr. Undergraduate/Graduate.
Concepts and methods for designing, testing, and estimation of component and system reliabilities. Failures/failure rates; life tests; series-parallel and standby systems; stress levels; redundancy and reliability apportionment; maintainability, availability, and safety; reliability design/implementation.
Prerequisites: junior standing and IND ENG 367(P) or equivalent; or graduate standing.
Course Rules: MECHENG 572 and IND ENG 572 are jointly offered and count as repeats of one another.
Last Taught: Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 572G Reliability Engineering
3 cr. Undergraduate/Graduate.
Concepts and methods for designing, testing, and estimation of component and system reliabilities. Failures/failure rates; life tests; series-parallel and standby systems; stress levels; redundancy and reliability apportionment; maintainability, availability, and safety; reliability design/implementation.
Prerequisites: junior standing and IND ENG 367(P) or equivalent; or graduate standing.
Course Rules: MECHENG 572 and IND ENG 572 are jointly offered and count as repeats of one another.
Last Taught: Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 575 Design of Experiments
3 cr. Undergraduate/Graduate.
Statistical principles, designs and analyses for planned experimentation; factorial and fractional factorial designs, inner-outer designs, robustness, confounding and blocking, and response surface methodology.
Prerequisites: IND ENG 367(P) or equivalent.
Last Taught: Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 575G Design of Experiments
3 cr. Undergraduate/Graduate.
Statistical principles, designs and analyses for planned experimentation; factorial and fractional factorial designs, inner-outer designs, robustness, confounding and blocking, and response surface methodology.
Prerequisites: IND ENG 367(P) or equivalent.
Last Taught: Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 577 Dimensional Measurement and Tolerancing
3 cr. Undergraduate/Graduate.
Measurement techniques; implementation and integration of precision measuring equipment and gages in manufacturing systems; geometric dimensioning and tolerancing; and devices for statistical process control.
Prerequisites: senior standing and IND ENG 467(P).
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 577G Dimensional Measurement and Tolerancing
3 cr. Undergraduate/Graduate.
Measurement techniques; implementation and integration of precision measuring equipment and gages in manufacturing systems; geometric dimensioning and tolerancing; and devices for statistical process control.
Prerequisites: senior standing and IND ENG 467(P).
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 580 Ergonomics
3 cr. Undergraduate/Graduate.
Broad study of ergonomics principles and stresses in design and analysis of workplaces and physical environment.
Prerequisites: IND ENG 367(P).
Course Rules: 2 hrs lec & 2 hrs lab/week.
Last Taught: Fall 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 580G Ergonomics
3 cr. Undergraduate/Graduate.
Broad study of ergonomics principles and stresses in design and analysis of workplaces and physical environment.
Prerequisites: IND ENG 367(P).
Course Rules: 2 hrs lec & 2 hrs lab/week.
Last Taught: Fall 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 582 Ergonomic Job Evaluation Techniques
3 cr. Undergraduate/Graduate.
Review of popular, contemporary methods of job evaluation for risk of low back pain and distal upper extremity.
Prerequisites: IND ENG 580(P).
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 582G Ergonomic Job Evaluation Techniques
3 cr. Undergraduate/Graduate.
Review of popular, contemporary methods of job evaluation for risk of low back pain and distal upper extremity.
Prerequisites: IND ENG 580(P).
Last Taught: Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 583 Facility Layout and Material Handling
3 cr. Undergraduate/Graduate.
Basics in facility planning; design and integration of plant layout, material handling, and warehousing; quantitative models for facility location problems.
Prerequisites: IND ENG 370(P) and IND ENG 455(C).
Last Taught: Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 583G Facility Layout and Material Handling
3 cr. Undergraduate/Graduate.
Basics in facility planning; design and integration of plant layout, material handling, and warehousing; quantitative models for facility location problems.
Prerequisites: IND ENG 370(P) and IND ENG 455(C).
Last Taught: Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 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: junior standing, ELECENG 234(P), and CIV ENG 202(C).
Course Rules: IND ENG 584 and MECHENG 584 are jointly offered and count as repeats of one another.
Last Taught: Spring 2013, Spring 2012.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 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: junior standing, ELECENG 234(P), and CIV ENG 202(C).
Course Rules: IND ENG 584 and MECHENG 584 are jointly offered and count as repeats of one another.
Last Taught: Spring 2013, Spring 2012.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 587 Lean Production Systems
3 cr. Undergraduate/Graduate.
An integrated approach to efficient manufacturing of products with high quality, low cost, and timely delivery including one-piece flow, pull system, and visual factory.
Prerequisites: IND ENG 350(P) or MATLENG 330(P).
Last Taught: Spring 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 587G Lean Production Systems
3 cr. Undergraduate/Graduate.
An integrated approach to efficient manufacturing of products with high quality, low cost, and timely delivery including one-piece flow, pull system, and visual factory.
Prerequisites: IND ENG 350(P) or MATLENG 330(P).
Last Taught: Spring 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 588 Global Supply Chain Management
3 cr. Undergraduate/Graduate.
Global supply chain strategies, achieving strategy fit, demand forecasting, inventory management, distribution strategies, transportation logistics, supply chain network optimization models, pricing and revenue management, and supply chain sustainability and resilience.
Prerequisites: junior standing and IND ENG 367(P); or graduate standing.
Course Rules: Counts as a repeat of IND ENG 590 with similar topic.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 588G Global Supply Chain Management
3 cr. Undergraduate/Graduate.
Global supply chain strategies, achieving strategy fit, demand forecasting, inventory management, distribution strategies, transportation logistics, supply chain network optimization models, pricing and revenue management, and supply chain sustainability and resilience.
Prerequisites: junior standing and IND ENG 367(P); or graduate standing.
Course Rules: Counts as a repeat of IND ENG 590 with similar topic.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 590 Topics in Industrial and Systems Engineering:
1-3 cr. Undergraduate/Graduate.
Selected topics of current interest in an area of systems design.
Prerequisites: junior standing.
Course Rules: May be retaken with change in topic to max of 9 cr.
Last Taught: Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 590G Topics in Industrial and Systems Engineering:
1-3 cr. Undergraduate/Graduate.
Selected topics of current interest in an area of systems design.
Prerequisites: junior standing.
Course Rules: May be retaken with change in topic to max of 9 cr.
Last Taught: Spring 2025.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 595 Capstone Project
3 cr. Undergraduate.
Capstone design projects involving design of a production/service system. Progress reports, final report, and presentation.
Prerequisites: senior standing; IND ENG 112(P); IND ENG 250(C); IND ENG 360(C); IND ENG 420(C); IND ENG 455(C); IND ENG 465(C); and IND ENG 475(C).
Course Rules: Previously IND ENG 485.
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 699 Independent Study
1-3 cr. Undergraduate/Graduate.
Prerequisites: junior standing and consent of instructor.
Course Rules: Limited to max of 6 cr applied toward undergraduate degree.
Last Taught: Fall 2023, Spring 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 699G Independent Study
1-3 cr. Undergraduate/Graduate.
Prerequisites: junior standing and consent of instructor.
Course Rules: Limited to max of 6 cr applied toward undergraduate degree.
Last Taught: Fall 2023, Spring 2022.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 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: graduate standing.
Course Rules: CV ENG 700, COMPSCI 700, ELECENG 700, IND ENG 700, MATLENG 700 and 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/

IND ENG 715 Data Acquisition and Visualization for Decision Making
3 cr. Graduate.
Addresses big data challenges that need to be conquered when converting data into information. Students will gain knowledge of current data acquisition techniques, especially in operations.
Prerequisites: graduate standing.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 716 Engineering Statistical Analysis
3 cr. Graduate.
Statistical methods and their applications to solve engineering decision-making problems, integrating computer usage. Inference, probability and probability distributions, data analysis, regression analysis, and anova.
Prerequisites: graduate standing.
Last Taught: Spring 2024, Spring 2023, Spring 2022, Spring 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 717 Operations Research in Engineering Management
3 cr. Graduate.
Various operations research techniques for engineering management decision-making. Linear programming, integer programming, network models, multi-objective decision-making, decision analysis, and queuing models.
Prerequisites: graduate standing and IND ENG 716(P).
Last Taught: Fall 2024, Fall 2023, Fall 2022, Fall 2021.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 741 Foundational Technologies for Connected Systems
1 cr. Graduate.
World trends and innovations that enabled current connectedness of enterprises, with a key focus to manufacturing enterprises. Introduction to business models and company culture that enabled the connected enterprise.
Prerequisites: graduate standing.
Last Taught: Fall 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 742 Cloud Architecture for Connected Systems
1 cr. Graduate.
Principles and concepts that affect a workforce that interacts with cloud infrastructure technologies, IoT, architecture, performance metrics, security aspects, and business factors.
Prerequisites: graduate standing.
Last Taught: Fall 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 750 Group Technology and Process Planning
3 cr. Graduate.
Group technology and computer-aided process planning; classification and coding schemes, machine loading, production planning/scheduling models, process planning, expert systems in capp.
Prerequisites: graduate standing, IND ENG 450(P) and IND ENG 455(P).
Last Taught: Spring 2007, Spring 2003, Spring 2001, Fall 1999.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 751 Flexible Manufacturing Systems
3 cr. Graduate.
Hierarchy of manufacturing control, process control, advanced concepts in fms, optimal design planning and production scheduling in fms.
Prerequisites: graduate standing, IND ENG 450(P) and IND ENG 455(P).
Last Taught: Spring 2023, Fall 2021, Fall 2020, Fall 2018.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 765 Advanced Mathematical Optimization: Algorithms, Math Modeling, and Theory
3 cr. Graduate.
Theory and application of linear programming, integer programming, and nonlinear programming optimization methods. Development of mathematical models of managerial problems found in several industries. Application of optimization methods in practical situations using state-of-the-art software.
Prerequisites: graduate standing, IND ENG 455(P), and COMPSCI 202(P) or COMPSCI 250(P) or equivalent computer programming experience.
Last Taught: Spring 2025, Spring 2021, Spring 2020, Spring 2019.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 772 Facilities Planning
3 cr. Graduate.
Modern techniques in facilities planning, location of the facility; systems approach, factors and evaluation. Systematic layout planning, computerized methods. Assembly line balancing, simulation techniques. Cpm and pert. Projects and laboratory work.
Prerequisites: graduate standing, IND ENG 445(P) and IND ENG 470(P).
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 777 Scheduling and realtime resource management
3 cr. Graduate.
Scheduling (allocation of resources over time) and realtime resource management techniques in highly informative production and service systems.
Prerequisites: graduate standing, IND ENG 370(P), IND ENG 475(P), IND ENG 455(P), and IND ENG 465(P); or consent of instructor.
Last Taught: Spring 2020, Spring 2017, Spring 2015, Fall 2010.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 780 Advanced Ergonomics - Low Back Pain
3 cr. Graduate.
An in-depth study of lbp causes, risk factors, preventive approaches, job evaluation/design techniques. 2 hr lec & 2 hr lab/week.
Prerequisites: graduate standing, IND ENG 580(P); and a course in anatomy & physiology; or consent of instructor.
Last Taught: Spring 2019, Spring 2013, Fall 2009, Fall 2007.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 783 Advanced Ergonomics - Upper Extremity
3 cr. Graduate.
In depth study of musculoskeletal disorders of upper extremity, personal and job risk factors, job analysis, design and prevention. 2 hr lec & 2 hr lab/week.
Prerequisites: graduate standing, IND ENG 580(P), and a course in Anatomy & Physiology; or consent of instructor.
Last Taught: Spring 2011, Fall 2008, Fall 2006, Spring 2005.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 790 Design Project
2-3 cr. Graduate.
Integration and application of concepts learned in other ergonomic courses to analyze and abate ergonomic hazards in a scientific manner.
Prerequisites: graduate standing, IND ENG 780(P), IND ENG 783(P), IND ENG 786(P), and IND ENG 788(P); or consent of instructor.
Course Rules: IND ENG 790 and OCCTHPY 790 are jointly offered and count as repeats of one another.
Last Taught: Spring 2007, Fall 2004, Fall 2003, Spring 2002.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 880 Bioengineering Seminar
1 cr. Graduate.
Presentations by bioengineering affiliated faculty, invited speakers, and graduate students.
Prerequisites: graduate standing.
Course Rules: CIV ENG 880, COMPSCI 880, ELECENG 880, IND ENG 880, MATLENG 880, and MECHENG 880 are jointly offered and count as repeats of one another. May be repeated to 3 cr max.
Last Taught: Fall 2018, Spring 2018, Spring 2017, Fall 2016.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 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: Fall 2020, Summer 2017, Summer 2016, Fall 2009.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 890 Advanced Topics in Industrial and Systems Engineering:
1-3 cr. Graduate.
Advanced topics of current interest in an area of systems-design; review of recent literature. Subject matter may be student initiated. Specific topics and any additional prerequisites will be announced in the Schedule of Classes.
Prerequisites: graduate standing.
Course Rules: May be repeated with change in topic to max of 15 cr.
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 990 Masters Thesis
1-9 cr. Graduate.
Prerequisites: graduate standing and consent of instructor.
Course Rules: Repeatable to 12 cr max.
Last Taught: Spring 2025, Fall 2024, Spring 2024, Fall 2023.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 998 Doctoral Thesis
1-12 cr. Graduate.
Prerequisites: graduate standing and consent of instructor and graduate program committee.
Course Rules: Repeatable.
Last Taught: Spring 2025, Fall 2024, Summer 2024, Spring 2024.
Current Offerings: https://catalog.uwm.edu/course-search/

IND ENG 999 Advanced Independent Study
1-3 cr. Graduate.
Prerequisites: graduate standing and consent of instructor and graduate program committee.
Course Rules: Repeatable to 15 cr max.
Last Taught: Summer 2025, Spring 2025, Summer 2024, Spring 2024.
Current Offerings: https://catalog.uwm.edu/course-search/