

ENGINEERING PROFESSIONAL DEVELOPMENT (E P D)

E P D 275 – TECHNICAL PRESENTATIONS

2 credits.

Principles and theory of effective oral technical presentations. Provides a framework for applying the principles in professional settings common to the engineering profession. Preparation, delivery, and evaluation of oral presentation on technical subjects, analysis of professional "real-world" technical presentations, survey of presentation technology, self-analysis including listening and non-verbal skills, and practice of group discussion and interview skills.

Requisites: Sophomore standing

Repeatable for Credit: No

Last Taught: Spring 2024

E P D 361 – FUNDAMENTALS OF ENGINE THERMODYNAMICS

2 credits.

Theory and application of energy methods in engineering; conservation of mass and energy; energy transfer by heat, work and mass; thermodynamic properties; analysis of open and closed systems; the second law of thermodynamics and entropy; vapor and gas power cycles.

Requisites: Consent of instructor

Repeatable for Credit: No

Last Taught: Summer 2023

E P D 398 – TECHNICAL COMMUNICATIONS INTERNSHIP

1 credit.

Internship with local corporation, industry, government agency, or educational unit. Includes classroom components: use and misuse of social media; managing workplace-related conflicts; communicating technical information to colleagues; identifying and resolving engineering ethics challenges; practicing group discussion and presentation skills.

Requisites: INTEREGR 397 and declared in Certificate in Technical Communication

Course Designation: Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2024

E P D 416 – ENGINEERING APPLICATIONS OF STATISTICS

3 credits.

Provides knowledge and skills to apply statistics to many types of engineering problems. Focuses on developing statistically-based experimental techniques and tests for measures of validity, application of computer-based statistical tools, and approaches to distillation of data.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

E P D 455 – PYTHON FOR APPLICATIONS IN ENGINEERING

1 credit.

Introduction to Python's concepts of objects and reference; classes and nested objects. Elements of object-oriented programming in Python. Container types: lists, dictionaries, and tuples. Installing Python packages and managing environments. Scientific computing with Numpy and SciPy. Applications of Python to Data Analysis. Applications of Python to Machine Learning. Applications of Python to embedded systems/robotics.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2022

E P D 497 – TECHNICAL EDITING

1 credit.

Principles and practices of editing technical and scientific documents. Overview of the editing process; defining the editor's rules and responsibilities, revising at structural and sentence levels, and addressing stylistic conventions of technical fields. Application to technical and scientific documents such as reports, proposals, and user manuals.

Requisites: INTEREGR 397

Repeatable for Credit: No

Last Taught: Spring 2016

E P D 499 – SENIOR INDEPENDENT STUDY

1-3 credits.

Under faculty supervision.

Requisites: Consent of instructor

Course Designation: Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Fall 2022

E P D 518 – QUALITY ENGINEERING AND QUALITY MANAGEMENT

3 credits.

Enhances the learners' basic business and decision-making skills related to quality systems and process improvement.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

E P D 610 – ENGINEERING ANALYSIS FOR DECISION MAKING

3 credits.

Quantitative and qualitative analysis and visualization tools. Structured decision-making methodology for engineering applications such as variations in materials and production, process control, forecasting and executive decision making. Facilitate persuasive problem-solving and decision making in engineering applications. Builds on foundational knowledge of statistics.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Applied Engineering Management

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

E P D 611 – ENGINEERING ECONOMICS AND MANAGEMENT

3 credits.

Addresses principles and practices of interpreting financial information and performing engineering-related economic analyses. Focuses on the practical use of economic information for decision-making.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Applied Engineering Management

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

E P D 612 – TECHNICAL PROJECT MANAGEMENT

3 credits.

Learn key principles and tools of project management applicable to a broad range of engineering projects. Covers techniques for project planning, scheduling, resource allocation, and project tracking, as well as the interface between projects and the organizations within which they are executed.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

E P D 613 – INTERNATIONAL ENGINEERING STRATEGIES AND PRACTICES

3 credits.

Provides a deeper understanding of various elements of culture related to business, avoiding the pitfalls, and finding the complementary strengths that will benefit the business. International strategy and the managerial implications such as product, country, location, and organization choices for a multinational engineering operation will be assessed, analyzed and applied. Further discussion will be focused on multi-cultural organization issues and exploring best practices.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

E P D 614 – MARKETING FOR TECHNICAL PROFESSIONALS

3 credits.

Equips practicing engineers and related technical professionals to develop an in-depth understanding of marketing. Learn to partner more effectively with marketing specialists, better market own ideas and projects, gain buy-in from upper management, and better serve internal and external clients.

Requisites: Graduate/professional standing. Not open to students declared in Business: Marketing, MBA.

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

E P D 616 – ENGINEERING LAW

2 credits.

Addresses important legal issues especially relevant to the practice of engineering. Gain awareness and ability to properly address patents, trade secrets, contracts, employment and non-disclosure agreements, as well as product and professional liability. Learn to avoid legal problems that often affect engineering projects and organizations.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

E P D 617 – COMMUNICATING TECHNICAL INFORMATION

3 credits.

Develops skills necessary for engineering professionals to communicate technical and managerial information. Covers approaches for communicating to diverse audiences and for action-oriented purposes. Emphasizes communication problem solving and communication efficiency. Includes individual and collaborative projects using oral, written, and electronic media.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

E P D 618 – APPLIED LEADERSHIP AND MANAGEMENT OF ENGINEERING ORGANIZATIONS

3 credits.

Addresses strategies, models, and practices for leading and managing engineering organizations in a context directly relevant to practicing engineers. Engage in self-reflection about styles, beliefs, and past experiences with leadership and management. Course project of direct relevance to student's organization will integrate theory, models, case studies, and real-time experiences from student's workplace. Gain broad exposure to diverse approaches to leadership and management, and a deeper understanding of how to put what is being learned into effective action.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

E P D 619 – FOSTERING AND LEADING INNOVATION

3 credits.

Learn to develop vision, culture, and practices that value and drive innovation within engineering and technical organizations. Grow your ability to build an enterprise that values, pursues, and delivers innovative technical services and products.

Requisites: Declared in Master of Engineering: Engineering Management, Data Analytics, Engine Systems, Manufacturing Systems Engineering, or Sustainable Systems Engineering

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

E P D 620 – ELECTRIFIED POWERTRAIN SYSTEMS

2 credits.

Micro, mild, full, and plug-in electrical powertrain systems, their components and the interactions between them, with special attention paid to generators, motors, and inverters. Learn about key metrics for sizing and matching components based on performance.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Powertrain Electrification

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

E P D 621 – BATTERIES FOR XELECTRIFIED VEHICLES

2 credits.

Concepts of vehicle hybridization levels; battery accessories, components, and materials; battery life and management; as well as various failure modes of batteries. Development of equivalent circuit models (ECM) for cells that can be used for real time control and diagnostics.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Powertrain Electrification

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

E P D 622 – ENGINE DESIGN I

3 credits.

Provides an understanding of engine applications, customer need assessment, and engineering product planning.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Engine Design

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2021

E P D 623 – ENGINE DESIGN II

3 credits.

Provides an advanced understanding of internal combustion engine design.

Requisites: E P D 622

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

E P D 624 – ENGINE PERFORMANCE AND COMBUSTION

3 credits.

Provides a physically based understanding of combustion, efficiency, and exhaust emission formation and control in internal combustion engines.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2022

E P D 625 – ENGINE GAS DYNAMICS

3 credits.

Provides a physically based understanding of gas dynamics with applications to internal combustion engines.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2023

E P D 627 – PERSPECTIVES ON ENGINE MODELING SEMINAR

1 credit.

Problem definition and planning, tool selection, model construction, calibration, application and data presentation in order to integrate the most appropriate modeling tools into an engine design and development project.

Requisites: Graduate/professional standing, declared in Capstone Certificate in Engine Design, or declared in Capstone Certificate in Powertrain Electrification

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

E P D 628 – ANALYSIS OF TRENDS IN ENGINES

1 credit.

Scientifically-based look at trends in energy availability, emission control and regulation, and technological advances to make an assessment of the future of engines and powertrain systems for vehicles throughout the world. Emphasis on trends for sustainable mobility solutions.

Requisites: Graduate/professional standing, declared in Capstone Certificate in Engine Design, or declared in Capstone Certificate in Powertrain Electrification

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Summer 2022

E P D 629 – POWERTRAIN SYSTEMS AND CONTROLS

3 credits.

Explore fundamental control concepts for development and analysis, modeling requirements and considerations related to control and diagnostics, and the application of these tools to powertrain systems.

Requisites: Declared in Engineering: Engine Systems ME or Capstone Certificate in Powertrain Electrification

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

E P D 630 – ENGINE DESIGN III

3 credits.

Builds further experience in engine development project organization; materials and processes; and engine validation. Project organization lessons emphasizing the phases of engine development and the importance of a design freeze with increased scrutiny of design modifications as the engine progresses toward production. Additional engine system components and processes such as forging, plastic molding, and billet machining. Reliability validation expanded to component and system-level validation through rig and engine testing. Test plans calibrated to engine volumes and cost in order to develop an appropriate mechanical development and reliability plan.

Requisites: E P D 623**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2024**E P D 631 – ELECTRIFIED VEHICLE-LEVEL MODELING**

2 credits.

Development of hybrid and electric vehicle powertrain and sub-system mathematical models. Simulations of drive cycles for evaluating component, sub-system, or package performance in the vehicle for fuel economy and emissions.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Powertrain Electrification**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**E P D 633 – ENGINE BOOSTING**

2 credits.

Application of fundamental fluid dynamics and thermodynamics principles to intake air boosting for internal combustion engines. Turbocharger and Supercharger design and operating principles, applications to engine system design. Includes both simple, single-stage systems, and multi-stage systems (series, series-sequential, parallel-sequential). Pulse conservation and exhaust gas recirculation will be addressed. Includes advanced considerations including the Miller Cycle, turbocompounding, and e-boosting.

Requisites: E P D 625 or concurrent enrollment**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Summer 2023**E P D 635 – EXHAUST AFTERTREATMENT SYSTEMS**

2 credits.

Fundamental development of the science and engineering underlying the design of exhaust aftertreatment (catalyst) systems for automotive (internal combustion engine containing) systems. Emphasis is on gasoline and diesel, spark-ignition and compression-ignition combustion engines, though the same fundamentals may be applied to other fuels or combustion types. Introductory material is included on aspects that are related to emissions, including regulatory standards, gasoline and diesel engine basics, fuels, lubricants, combustion, instrumentation, and formation of pollutants. Several causes of emissions and pollutants are intertwined throughout the various topics and the control and treatment of specific emissions species are discussed by device type.

Requisites: Graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2023**E P D 636 – INTRODUCTION TO POLYMERS**

3 credits.

Introduction to the chemistry and physics of polymeric materials. Concepts of polymer synthesis as well as physical properties are introduced, including molecular weight, chain conformation, step growth and chain growth kinetics, basic rheology and viscoelasticity as well as glass transition and crystallinity.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Polymer Processing & Manufacturing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Fall 2023**E P D 637 – POLYMER CHARACTERIZATION**

3 credits.

Basic principles used for both quantitative and qualitative characterization of polymeric materials, including both assessment of their synthesis and of their structural features at different length scales. Discussion of techniques such as NMR (Nuclear Magnetic Resonance) and GPC (Gel Permeation Chromatography), thermal characterization, rheological characterization, as well as scattering of various types of electromagnetic radiation. Introduction to characterization methods used in industry and polymer crystallography.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Polymer Processing & Manufacturing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2024

E P D 638 – POLYMER COATINGS

3 credits.

Introduction to coatings, especially focusing on the polymer science and chemistry in these coatings. Chemistry behind these coatings, physical science such as film formation, and the role of various additives used in common formulations.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Polymer Processing & Manufacturing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Summer 2023

E P D 639 – PLASTICS RECYCLING AND SUSTAINABILITY

3 credits.

Sustainability and recycling aspects in the life cycles of plastics and polymeric materials. Chemistries that can be used to make polymers from sustainable or renewable sources and biodegradable polymers. Current recycling practices and their limitations including polymer-based materials such as composites and layered packaging. Textile recycling and plastic pollution including microplastics are covered.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Polymer Processing & Manufacturing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

E P D 640 – INTRODUCTORY POLYMER RHEOLOGY

3 credits.

Introduction to polymer rheology. Concepts of continuum mechanics are introduced, specifically the fluid dynamics of non-Newtonian and linear viscoelastic fluids. Material functions, constitutive equations and rheometry and experimental methods for measuring material functions (rheometry) are discussed. Knowledge of linear differential equations [such as MATH 319 or 320] and fluid mechanics [such as ME 363] or momentum transfer [such as CBE 320] required.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Polymer Processing & Manufacturing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

E P D 642 – THERMODYNAMICS OF ENGINE SYSTEMS

3 credits.

Use the 1st and 2nd laws of thermodynamics in the analysis of engines. Use ideal gas mixtures, thermodynamics and combustion principles to determine adiabatic flame temperature and chemical equilibrium - with focus on Engine Systems

Requisites: Declared in Engineering: Engine Systems MEng

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

E P D 645 – ELECTRIC MACHINES FOR TRACTION APPLICATIONS

2 credits.

Reviews the physics of electric machines. Covers electric machine operation used both in motoring and generating modes necessary in traction applications. The fundamentals of brush DC, PM synchronous, reluctance, and induction machines are explored. Begins with the basics of DC machines and extends to the concept of field orientation in AC machines.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Powertrain Electrification

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

E P D 646 – ELECTRIC DRIVES FOR TRACTION APPLICATIONS

2 credits.

Electric drives operation used both in motoring and generating modes necessary in traction applications. The fundamental drives of brush DC, PM synchronous, reluctance, and induction machines are explored. Begins with the basics of drives and extends to the device physics of power electronics used in drives.

Requisites: E P D 645 or declared in Capstone Certificate in Powertrain Electrification

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

E P D 647 – TRENDS IN ELECTRIFICATION SEMINAR

1 credit.

Discussion of major trends in the automotive and transportation industry, focused on electrification for hybrids, fuel cells, and fully electric vehicles.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Powertrain Electrification

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Summer 2023

E P D 650 – INTRODUCTION TO POLYMERS PROCESSING

3 credits.

Introduction to the principles of polymer processing. Review of the basic techniques primarily in use by industry as well as foundational principles of polymer physics, viscoelasticity and rheology. Focus on understanding how design of process is used to achieve desired structure and properties. Includes introduction to topics such as 3-d printing and recycling of polymer waste in the context of reprocessing such materials.

Requisites: E P D 636 and (E P D 640 or CHEM/M S & E 421, or concurrent enrollment), or declared in Capstone Certificate in Polymer Processing Manufacturing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2022

E P D 654 – TEACHING IN SCIENCE AND ENGINEERING

2-3 credits.

Introduction to teaching and learning in science and engineering at the college level. Includes exploration of the learning process, teaching methodology, assessment strategies, course design, teaching philosophies, and careers in education, science, and engineering.

Requisites: Graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2020**E P D 660 – CORE COMPETENCIES OF SUSTAINABILITY**

3 credits.

Introduces real-world pragmatic skills and applications in sustainability competencies. Content reaches across engineering expertise, from chemical engineering to buildings to product design and energy. Modules cover ecological footprinting, lifecycle assessment, resource use and integrated engineering practice.

Requisites: Graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Fall 2023**E P D 669 – SUSTAINABLE SYSTEMS ENGINEERING CAPSTONE**

3 credits.

Provides the opportunity to demonstrate ability to think globally, sustainably, and creatively. Gain real-world experience by applying theory, tools, and research to conceptualize, analyze, and design a solution to a real-world problem within a social and environmental context. Showcase the knowledge and analytical skills acquired, and integrate tools, science, and communication to address a community or industry need. Work with an industry mentor and customer throughout your project.

Requisites: Consent of instructor**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2024**E P D 678 – SUPPLY CHAIN MANAGEMENT FOR ENGINEERS**

3 credits.

Examines concepts, management techniques, and current trends in the field of supply chain management with emphasis on topics relevant to engineers. Topics include global logistics, logistics engineering techniques, new product introduction process, purchasing strategy, managing transportation providers, distribution center technology and operations, outsourcing supply chain functions, and an introduction to supply chain information systems.

Requisites: Graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Fall 2023**E P D 690 – SPECIAL TOPICS IN ENGINEERING PROFESSIONAL DEVELOPMENT**

1-3 credits.

Topics vary.

Requisites: None**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** Yes, unlimited number of completions**Last Taught:** Summer 2023**E P D 699 – INDEPENDENT STUDY**

1-3 credits.

Under faculty supervision.

Requisites: Graduate/professional standing**Course Designation:** Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions**Last Taught:** Spring 2024**E P D 701 – WRITING FOR PROFESSIONALS**

1 credit.

Preparation to produce effective written communication that is suitable for inter-professional and inter-disciplinary audiences in a variety of workplaces. Apply these strategies and tools.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Applied Engineering Management**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Summer 2021**E P D 702 – PROFESSIONAL PRESENTATIONS**

1 credit.

Sharpen your ability to create, edit, review, and present information in an efficient, clear, and effective way for your audiences. Develop your presentation skills through a series of presentations related to your professional interests and work.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Applied Engineering Management**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2024**E P D 704 – ORGANIZATIONAL COMMUNICATION AND PROBLEM SOLVING**

1 credit.

Improve your problem solving within complex organizations, with a special emphasis on case studies and improving communication, using cross-disciplinary sources.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Foundations of Professional Development**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Fall 2023

E P D 706 – CHANGE MANAGEMENT

1 credit.

Provides emerging and practicing professionals foundational knowledge to develop a change management strategy and implement it using proven processes and tools. Become better prepared to deliver effective organizational performance. Applies contemporary concepts and methods in change management through student-selected projects.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Foundations of Professional Development

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

E P D 708 – CREATING BREAKTHROUGH INNOVATIONS

1 credit.

Explore innovation and how design thinking is a driver of innovation. Learn to use various design thinking methods and tools for analysis and decision-making.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Foundations of Professional Development

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Summer 2023

E P D 710 – FOUNDATIONS OF ENGINEERING LEADERSHIP

2 credits.

Build the foundations for developing, refining, and strengthening your effectiveness as a leader of engineering teams, projects, and organizations. Enhance your understanding of how to match your leadership style to a team's focus, organization, and culture. Grow your understanding of your strengths and weaknesses as a leader using proven assessment tools. Develop a plan for growing your leadership competency.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Applied Engineering Management

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Summer 2023

E P D 712 – ETHICS FOR PROFESSIONALS

1 credit.

Explores how our actions affect others and influence the choices we make within the workplace. Enhance ethical competencies by providing opportunities to discuss challenges to behavior and decision-making in different professional contexts.

Requisites: Graduate/professional standing or declared in Capstone Certificate in Applied Engineering Management

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

E P D 720 – ENGINE NOISE AND VIBRATION

2 credits.

Introduces the engineer to fundamental NVH (Noise, Vibration, and Harshness) concepts with an emphasis on how NVH can be integrated throughout the engine development process from initial concept inception through to validation testing for production.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Summer 2020

E P D 730 – SUSTAINABLE FACILITIES

3 credits.

Explore the environmental impacts of commercial and residential buildings, including energy, water, materials, transportation, waste, human health, and land use. All phases of a building's life cycle will be considered, along with relevant case studies, benchmarking tools, public policies and emerging concepts.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2022

E P D 731 – ENERGY EFFICIENCY IN BUILDINGS

3 credits.

Core principles of energy use and efficiency in the building sector (residential, commercial, institutional buildings.) Factors that influence energy demand (design, equipment, controls, operation, maintenance). Review of engineering fundamentals of heat transfer, heating and cooling loads, psychometrics. Topics include building envelope principles (climate, orientation, materials, massing), heating and cooling systems, ventilation indoor air quality, plumbing water heating, lighting daylighting, and internal energy uses (plug loads, equipment). Zero energy building concepts, energy modeling, and energy benchmarking are also covered. Applications include existing building operation and improvement, and new building design and planning.

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2023

E P D/ACCT IS/GEN BUS 781 – FINANCIAL AND BUSINESS ACUMEN

1 credit.

This course is designed with a keen awareness for the needs of the non-financial student or professional. For this class, no previous financial training is required. The intent is to equip you with the essential concepts used to develop financial literacy. Content will cover basic financial terms and reports, analytical tools to help interpret financial data and using financial data in budgets and forecasts.

Requisites: Graduate/professional standing. Not open to students declared in an MBA program

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Summer 2023

E P D/GEN BUS/MARKETNG 782 – MARKETING FOR NON-MARKETING PROFESSIONALS

1 credit.

An overview of marketing's role within an organization, the key elements of a marketing plan, and how the plan is implemented. Students will learn about buyer demographic, psychographic and purchasing decision behavior. A thorough understanding of the customer enables students to develop a coordinated marketing mix (product, price promotion and place) that will satisfy the customer better than the competition and at the required margin. Students will leave the course understanding the degree to which all company functions must be coordinated and focused on the customer. This course will not apply toward fulfilling the MBA degree requirements.

Requisites: Graduate/professional standing or declared in graduate Business Exchange program

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2023

E P D/GEN BUS/M H R 783 – LEADING TEAMS

1 credit.

Students will gain the knowledge and skills to continuously enhance their own team performance and productivity as well as the teams they are involved with. They will also be in a much better position to lead teams effectively.

Requisites: Graduate/professional standing or declared in graduate Business Exchange program

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

E P D/GEN BUS/OTM 784 – PROJECT MANAGEMENT ESSENTIALS

1 credit.

Techniques that will help to plan, execute, and deliver projects with desired scope on time and on budget. Learn to document clear project objectives and goals, accurately estimate project time and costs, schedule and allocate time-critical resources, and establish feedback systems for optimal project control.

Requisites: Graduate/professional standing or declared in graduate Business Exchange program

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Summer 2023

E P D/GEN BUS/M H R 785 – EFFECTIVE NEGOTIATION STRATEGIES

1 credit.

Improves students' negotiating skills, doing so by providing a theoretical underpinning that will help them to understand the sources of effective and ineffective approaches to negotiations.

Requisites: Graduate/professional standing or declared in graduate Business Exchange program

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Summer 2023