Product Development and Design Emphasis: Course Suggestions

2022-2026 Catalog

This list of classes is a suggestion for you as you build your Emphasis. You will have to make sure you have the pre-requisites and in some cases you also might need to get permission from the faculty teaching the class.

BUS 310: Introduction to Entrepreneurship. Role and impact of entrepreneurship and technology startups; characteristics and traits of entrepreneurs; opportunity identification and assessment; frameworks for building startups; the founding team; organizational and legal issues; business and value proposition models; acquiring resources; entrepreneurial risk; realizing and harvesting value.

BUS 382: Leadership and Organizations. Evaluation of macro dimensions of business organizations including environment, mission, goals, strategies, structure, people, and technology. Internal leadership processes at different organizational levels.

ME 228: Engineering Design Communication. Use of engineering communication principles to communicate details of project designs including sketching, orthographic projection, section and auxiliary views, dimensioning, and tolerances.

ME 234: Philosophy of Design. General approach to the meaning of engineering design. Conceptual blocks, creativity, design process, design considerations and elements.

ME 251: Introduction to Detailed Design with Solid Modeling. Part and system or assembly design with solid modeling using current software and hardware. Techniques of advanced communication including weld symbols, threaded fasteners, dimensioning and tolerancing. Creation of design layouts and part models with varied configurations and dynamic assembly models. Introduction to section mass and inertia properties.

ME 326: Intermediate Dynamics. Additional analysis of planar motion of rigid bodies with particular attention to rotating reference frames. Kinematics of linkages, three dimensional dynamics, introduction to numerical methods and dynamic simulation of mechanisms.

ME 328: Design for Strength and Stiffness. Design of machine parts by stress and deflection. Effects of fluctuating stresses and stress concentration. Design of shafts and other machine parts.

ME 329: Mechanical Systems Design. Design of mechanical equipment and systems using various machine elements and components such as threaded fasteners, power screws, springs, gears, bearings, clutches, prime movers, etc. Decision modeling based on technical and economic feasibility.

IME 319: Human Factors Engineering. Analysis of factors influencing the efficiency of human work. Data on the physical and mental capacities of persons, the physical environment, work organization, and the problem of aging. Design of machines, operations, human computer interface and work environment to match human capacities and limitations, including the handicapped.

IME 330: Fundamentals of Manufacturing Engineering. Engineering analysis of manufacturing processes for casting, molding, forming, joining, and machining. Design for manufacturability and estimation of production costs. Process design strategies. Setup and operation of processing equipment; inspection methods.

IME 335: Computer-Aided Manufacturing I. Use of the computer to communicate design information to manufacturing. Computer Numerical Control (CNC) programming. Use of CAD/CAM software. Overview of manufacturing systems in an automated environment, including cellular manufacturing and computer-aided process planning.

IME 342: Manufacturing Systems Integration. Analysis and design tools for production planning and control of manufacturing systems, including mathematical modeling of operations and computer tools for simulation. Decision-making models for manufacturing systems. Overview of material requirements planning, inventory models and analysis, and facilities design.

IME 401: Sales Engineering. Concepts and principles of engineering in sales. Role of the professional engineer in the analysis, design, development, production, and final application of a product or system required by the buyer.

IME 418: Product-Process Design. Innovative new product design and creative development process. Design for manufacturability. Study of constraints for prototyping, designing, testing, processing, quality, and customer satisfaction. Life-cycle analysis. Examination of relevant environmental and ethical issues.

EE 321 and 361: Electronics and Laboratory. Semiconductor devices and circuits. Instrumentation amplifiers, power control rectifiers, feedback, pulse circuits, digital logic circuits.

ITP 233: Product Modeling and Communication. Fundamental theory and practice of digital modeling with emphasis on hands-on use of two dimensional and three-dimensional modeling software commonly used in industry. Includes part/assembly modeling, geometric dimensioning/tolerancing and fundamental skills in communicating product design data in accordance with industry standards.

ITP 303: Lean Six Sigma Green Belt. Develop skills to function as lean six sigma leader. Discussion and problem sessions cover lean six sigma green belt body of knowledge: define, measure, analyze, improve, control.

ITP 326: Product Design and Development. Overview of user-centered design methods involving sketching and quick prototyping techniques for new product development. Topics include: design thinking, identification of user needs, concept generation/selection/testing, industrial design, visual perception, ergonomics, sustainable design, product architecture, and intellectual property.

ITP 330: Packaging Fundamentals. Overview of packaging functions, materials and development. Discuss value addition to product-package systems via various packaging materials, processes, design and protective packaging for global distribution. Illustrates the impact of packaging on environment.