INDUSTRIAL TECHNOLOGY AND PACKAGING (ITP)

ITP Courses

ITP 100. Student Orientation, College Success and Career Readiness. 1 unit
Orientation to ITP major and concentrations. Development of a personalized graduation plan. Skills for academic success: goal setting, time management, study skills, registration strategies, overall adjustment to college life, including connection to a social peer network and Career Readiness. Field trip required. 1 activity.

ITP 125. Introduction to Supply Chain and Packaging Systems. 3 units
Comprehensive overview of topics and opportunities in Industrial Technology and Packaging. Discusses fundamentals of product and package design, operations, supply chain management, innovation, and sustainability as related to curriculum. Includes practical application of tools to address real world challenges. 3 lectures.

ITP 150. Industrial Power Systems. 4 units
Corequisite: PHYS 123.
A survey of common industrial power systems. Labs include fundamentals of electrical/electronic circuits, fluid power, internal combustion engines and renewable energy sources. 3 lectures, 1 laboratory.

ITP 203. Personal Leadership - 7 Habits. 4 units
Learn and practice the what, why, and how of personal leadership. Uses the 7 Habits of Highly Effective People framework to provide students with skills they will use repeatedly in their careers and life. Course offered online only. 4 lectures.

ITP 211. Industrial Safety and Quality Program Leadership. 4 units
Prerequisite: ITP 150.
Effective program development and leadership to implement safety and quality process improvement. Application of industrial leadership, knowledge, skills and methods to develop and implement total safety and quality management programs. Class project includes the oral presentation. 3 lectures, 1 activity.

ITP 233. Product Modeling and Communication. 4 units
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. 2 lectures, 2 activities.

ITP 234. Packaging Design Fundamentals. 4 units
A comprehensive overview of fundamental structural and graphic concepts for package design. Focus on design thinking, two-dimensional and three-dimensional form creation, design elements, visual perception, photo rendering, and rapid prototyping. 3 lectures, 1 laboratory.

ITP 260. Manufacturing Processes and Materials. 4 units
Prerequisite: CHEM 111 or CHEM 124 or CHEM 127.
Introduction to a wide variety of manufacturing processes and materials with emphasis on metallic products. Analysis of relationships among manufacturing processes, materials and product design. Provides experiential learning on safe and efficient operations of manufacturing equipment. 3 lectures, 1 laboratory.

ITP 270. Selected Topics. 1-4 units
Prerequisite: Open to undergraduate students and consent of instructor.
Directed group study of selected topics. The Class Schedule will list topic selected. Total credit limited to 8 units. 1 to 4 lectures.

ITP 275. Industrial Facility Systems and Equipment. 4 units
Prerequisite: ITP 150. Corequisite: ITP 211.
Develop an understanding of contemporary issues in modern industrial facilities. Emphasis on support systems and equipment such as heating and cooling; material handling; electrical, hydraulic, pneumatic power systems; and energy management. Includes facilities sustainability and lean practices. 3 lectures, 1 activity.

ITP 302. Developing and Presenting New Enterprise Strategies. 4 units
Prerequisite: Completion of GE Area A1 with a grade of C- or better (GE Area A2 for students on the 2019-20 or earlier catalogs); and BUS 346.
Taking new industrial enterprise concept to launch. Planning and management of product-based start-up including integration of: product development; manufacturability and costs; outsourcing; channel selection; supply chain; inventory and scheduling. Application to project case study. Emphasis on developing effective technical presentations. 2 lectures, 2 activities.

ITP 303. Lean Six Sigma Green Belt. 4 units
Prerequisite: STAT 217, STAT 218, STAT 251, or any 300 or 400 level statistics course.
Develop skills to function as a lean six sigma leader. Discussion and problem sessions cover lean six sigma green belt body of knowledge: define, measure, analyze, improve, control. Team skills necessary to complete projects. Course may be offered in classroom-based or online format. 4 lectures.

ITP 326. Product Design and Development. 4 units
Prerequisite: ITP 233 or BUS 310.
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. 3 lectures, 1 laboratory.
ITP 330. Packaging Fundamentals. 4 units  
2020-21 or later: Upper-Div GE Area B  
2019-20 or earlier catalog: GE Area B5, B6, or B7  
Prerequisite: Junior standing; completion of GE Area A with grades of C- or better; completion of GE Area B1 (GE Area B3 for students on the 2019-20 or earlier catalogs); and one course in GE Area B4 with a grade of C- or better (GE Area B1 for students on the 2019-20 or earlier catalogs).

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. 3 lectures, 1 laboratory. Fulfills GE Area Upper-Division B (GE Areas B5, B6, or B7 for students on the 2019-20 catalog).

ITP 341. Packaging Polymers and Processing. 4 units  
2020-21 or later: Upper-Div GE Area B  
2019-20 or earlier catalog: GE Area B5, B6, or B7  
Prerequisite: Junior standing; completion of GE Area A with grades of C- or better; CHEM course in GE Area B1 (GE Area B3 for students on the 2019-20 or earlier catalogs); and one course in GE Area B4 with a grade of C- or better (GE Area B1 for students on the 2019-20 or earlier catalogs).

Physical and chemical properties of plastics materials and processing techniques. Evaluation of current materials and technologies to reduce waste and to improve reuse and recycling. Applied laboratory using common industry processes emphasizes relationships among processing, structure, properties, and consumer response. 3 lectures, 1 laboratory. Fulfills GE Area Upper-Division B (GE Areas B5, B6, or B7 for students on the 2019-20 catalog).

ITP 371. Supply Chain Management in Manufacturing and Services. 4 units  
Prerequisite: A grade of C- or better, or consent of instructor, in: MATH 141 or MATH 221, and STAT 217 or STAT 218 or STAT 251 or any 300 or 400 level statistics course.

Introduction to supply chain management and performance metrics. Supply or value chains dealing with hard goods and services from design to daily management. Project management techniques and technology for making and implementing decisions. Course may be offered in classroom-based or online format. 4 lectures.

ITP 390. Industrial Automation. 4 units  
Prerequisite: ITP 260.

Programming and setup of computer-controlled manufacturing/assembly machinery. Includes introduction to smart manufacturing and industrial internet of things. Familiarization with CNC machines, robots, 3D printing, programmable logic controllers and online data monitoring. 3 lectures, 1 laboratory.

ITP 400. Special Problems for Advanced Undergraduates. 1-4 units  
Prerequisite: Consent of instructor.

Individual investigation, research, studies, or surveys of selected problems. Total credit limited to 8 units, with a maximum of 4 units per quarter.
ITP 412. Instrumental Analysis of Packaging Polymers. 4 units
Prerequisite: ITP 341.
Overview of various analytical methods and tools used for the evaluation of polymers and other packaging materials including thermal characterization, spectroscopy, chromatography. Qualitative and quantitative analysis of the matter. Identification of polymeric materials and morphology. Mass transfer measurement. 3 lectures, 1 laboratory.

ITP 413. Packaging Quality Assessment. 4 units
Prerequisite: ITP 341 and ITP 408.
Overview of the role that packaging quality plays in consumer packaged goods. Techniques used for testing and evaluating the quality of consumer product packaging, including material quality assessment, product-package interaction and human-package interaction. 3 lectures, 1 laboratory.

ITP 414. Packaging Laws & Regulations. 4 units
Prerequisite: ITP 408 and ITP 411.
Comprehensive overview of the U.S. laws and regulations applicable to packaging of different types of consumer products, and related government organizations. Awareness of legal and regulatory requirements related to packaging solutions. Course may be offered in classroom-based or online format. 4 lectures.

ITP 415. Supply Chain and Logistics. 4 units
Prerequisite: One of the following: ITP 303, ITP 326, ITP 330, or ITP 341; and ITP 371.
Key concepts, tools, and approaches for making effective supply chain and logistics decisions in support of business goals. Practical management issues and applications are the focus rather than theoretical, mathematical optimization. Business cases and simulations are used to illustrate and explore best practices. 4 lectures.

ITP 419. Cooperative Education/Internship. 1-4 units
Prerequisite: Approval of area chair, junior standing, and a CPSLO cumulative GPA of at least 2.5 without being on academic probation.
Work experience in business, industry, government and other areas of student career interest. Periodic written progress reports, final report, and evaluation by work supervisor required. Total credit limited to 4 units.

ITP 428. Commercialization of New Technologies. 4 units
Prerequisite: BUS 342, BUS 346, or ITP 326.
Concepts, frameworks, and experiences necessary to understand the business potential of technology innovations and determine if one or more sustainable market opportunities can be identified to exploit them. Hands-on exercises and real new inventions to illustrate concepts. 4 lectures.

ITP 430. Healthcare Packaging. 4 units
Prerequisite: ITP 330.
Study of packaging systems for pharmaceuticals, nutraceuticals, and medical devices. Characteristics and properties of materials, forms, and sterilization methods. Design principles for products for healthcare. Laboratory exercises on packaging operations, materials, and evaluation methods. International and federal regulations and standards. Field trip may be required. 3 lectures, 1 laboratory.

ITP 461. Senior Project I. 2 units
Prerequisite: Consent of instructor.
Selection and completion of a project under faculty supervision. Projects typical of problems graduates must solve in their field of employment. Project results presented in a formal report, and must be completed in two quarters. Minimum 120 hours total time.

ITP 462. Senior Project II. 2 units
Prerequisite: Consent of instructor.
Selection and completion of a project under faculty supervision. Projects typical of problems graduates must solve in their field of employment. Project results presented in a formal report, and must be completed in two quarters. Minimum 120 hours total time.

ITP 464. Applied Industrial Technology Senior Project Seminar. 4 units
Prerequisite: Senior standing.
Selection and analysis of industrial and technological problems and opportunities in directed individual or group-based projects. Problems typical to those which graduates could encounter in their fields of employment. Formal report required. Minimum 120 hours of total time. 4 seminars.

ITP 466. Applied Business and Production Management. 4 units
Prerequisite: ITP 211, ITP 233, ITP 260, ITP 326, and BUS 346.
An integrative manufacturing business and production systems experience, including design, prototyping, processing, quality control, resource management, cost-control, marketing, sales, packaging, and technical documentation. Team projects reflect the real-world, dynamic environment of product development and production. 2 lectures, 2 laboratories.

ITP 468. Blockchain in Business. 4 units
Prerequisite: ITP 392 or CSC 101 or CSC 232 or ECON 395.
Blockchain technology in business, with application examples in management (including HR, marketing and accounting), operation systems (manufacturing, supply chain and other service systems), finance (including stock trading, real estate transactions and P2P payment systems) and entrepreneurship. 4 lectures. Crosslisted as BUS/ITP 468.

ITP 470. Selected Advanced Topics. 1-4 units
Prerequisite: Consent of instructor.
Directed group study and seminars in selected topics in industrial technology. Open to undergraduate students. The Class Schedule will list topic selected. Total credit limited to 12 units. 1 to 4 lectures.

ITP 471. Selected Advanced Laboratory. 1-4 units
Prerequisite: Consent of instructor.
Directed group laboratory study of selected topics for advanced students. Open to undergraduate and graduate students. The Class Schedule will list topic selected. Total credit limited to 8 units. 1 to 4 laboratories.
ITP 475. Distribution Packaging Dynamics. 4 units
Prerequisite: ITP 330.
Survey of tests and procedures for packaging materials and packaging products following ASTM and ISTA standards. The testing procedures include tests for shock, vibration, drop and impact as prescribed for shipment by truck, rail, sea, and air. Hands-on product/packaging testing for quality control. 3 lectures, 1 laboratory.

ITP 485. Packaging Development. 4 units
Prerequisite: ITP 341, ITP 408, and ITP 475.
Integrative approach to developing new packaging systems by balancing the needs of the different value chain stakeholders. Interplay of package design for end-users, marketing, manufacturing, distribution, and disposal. Class project focuses on cross-disciplinary collaboration, design thinking, discovery, and disruptive innovation. 3 lectures, 1 laboratory.

ITP 500. Individual Study. 1-6 units
Prerequisite: OCOB graduate standing and formal petition with approval from the Associate Dean.
Advanced study planned and completed under the direction of a member of the department faculty. Open only to graduate students who have demonstrated ability to do independent work. Maximum of 6 units may be applied to degree requirements.

ITP 570. Selected Advanced Topics. 1-4 units
Prerequisite: OCOB graduate standing or approval from the Associate Dean.
Directed group study of selected topics for advanced students. Open to undergraduate students. The Class Schedule will list topic selected. Total credit limited to 16 units. 1 to 4 seminars.

ITP 571. Selected Advanced Topics Laboratory. 1-4 units
Prerequisite: OCOB graduate standing or approval from the Associate Dean.
Directed group laboratory study of selected topics for advanced students. The Schedule of Classes will list title selected. Total credit limited to 16 units. 1-4 laboratories.

ITP 599. Industrial and Technical Studies Thesis. 3 units
Prerequisite: OCOB graduate standing or approval from the Associate Dean.
Completion of a thesis involving individual research that is significant to the field of industrial and technical systems. A formal written proposal must be accepted by the Associate Dean of OCOB Graduate Programs before work begins. Course satisfies culminating experience requirement through the completion of the comprehensive thesis. Total credit limited to 9 units.