

INDUSTRIAL TECHNOLOGY AND MANAGEMENT

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For information regarding faculty visit the Industrial Technology and Management website .

The Bachelor of Industrial Technology and Management (BINTM) program is designed to prepare skilled adults for managerial positions in industry. This is a completion program for working individuals who have technical education in industrial specialties, including manufacturing, supply chain/logistics, construction, facilities maintenance/management, and other related areas. The program enables students to build upon existing skills, improve their managerial capabilities, and thereby expand their career opportunities.

Educational outcomes of the BINTM program include:

- Understand best practices in industry and methods of implementation.
- Identify and evaluate significant factors and issues affecting managerial decision-making.
- Ability to assume a leadership role and a higher level of professional responsibility.
- Understand how to address a wide range of operational and situational challenges.
- Understand the importance of ethical and sustainable industrial operations.
- Understand the dynamics of the global industrial landscape.
- Communicate effectively at all levels, in an objective and professional manner.
- Ability to function on multidisciplinary teams.

The program offers five professional specializations: Industrial Facilities (IF), Industrial Sustainability (ST), Manufacturing Technology (MT), Supply Chain Management (SCM), and Telecommunication Technology (TT). Students have the option to complete a specialization or take courses from more than one specialization area as electives. The core curriculum covers material applicable to all industrial sectors. This approach allows students to optimize course selection to suit individual career objectives.

The ideal candidate for this program is a person who is already working within, or has strong interest in, a career in industry or a related field. This curriculum provides a broad knowledge base which gives students the flexibility to advance within a chosen technical specialty or to move into a related career at a professional or management level.

Admission to the program is based on a review of college transcripts plus consideration of work experience and career goals. In general, 60 credit hours from an accredited college are needed for admission (only courses graded "C" or better are accepted for transfer). Those who have accrued at least 45 hours towards admission requirements may be admitted with the condition that all remaining requirements be completed within two years of starting the program. Candidates with more than 60 credit hours of transferable credit may qualify to have excess credit applied towards BINTM coursework.

To accommodate full-time work schedules, courses are offered evenings and Saturdays at the university's Mies Campus in Chicago, Rice Campus in Wheaton, IL, and via the Internet for students who are unable to attend live classes.

A three-course INTM certificate program is available for individuals interested in improving managerial and decision-making skills. The courses are part of the regular curriculum and can be applied toward the BINTM degree.

Degree Program

- Bachelor of Industrial Technology and Management

Co-Terminal Options

Industrial Technology and Management also offers a co-terminal degree, which enables a student to simultaneously complete both an undergraduate and graduate degree in as few as five years:

- Bachelor of Industrial Technology and Management/Master of Industrial Technology and Operations

The co-terminal degree allow students to gain greater knowledge in specialized areas while, in most cases, completing a smaller number of credit hours with increased scheduling flexibility. For more information, please visit the Industrial Technology and Management website (appliedtech.iit.edu/industrial-technology-and-management).

Certificate in Industrial Technology and Management

The three-course INTM certificate provides an introduction to industrial organizations and how they operate.

Certificate students should have at least two years of work experience and some college credit in industrial subjects. **The INTM certificate does not qualify for federal financial aid.**

Students must complete the following courses:

INTM 315	Industrial Enterprises	3
INTM 322	Industrial Project Management	3
INTM 410	Operations Management	3

Course Descriptions

INTM 301

Communications for the Workplace

Review, analyze and practice verbal and written communication formats found in the workplace. Emphasis is on developing skills in technical writing, oral presentations, business correspondence, and interpersonal communication using electronic and traditional media. Credit not granted for both INTM 301 and COM 421.

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 314

Maintenance Technology and Management

Maintenance of facilities is a major concern for all industrial operations. Course covers technologies involved as well as the management aspects of maintaining buildings, construction and equipment installation and maintenance for all types of operations.

Lecture: 3 Lab: 0 Credits: 3

INTM 315

Industrial Enterprises

An introduction to the world of industrial enterprises and the organizational priorities required to achieve efficiency and competitiveness. Students learn to assess the present state of a company, address performance issues, foster functional communication and cooperation between departments, identify sources and impacts of waste, identify value-added activities, and transform outdated business practices into flexible, customer-driven processes.

Lecture: 3 Lab: 0 Credits: 3

INTM 319

Electronics in Industry

Basic overview of electrical and electronic technology in industry. Emphasis on electrical and electronic components, industrial devices, electrical theory, application and basic troubleshooting. Students select and complete an electrical or electronic class project.

Lecture: 3 Lab: 0 Credits: 3

INTM 322

Industrial Project Management

Projects are the driving force behind innovation and improvement in any organization. This course identifies the tools and techniques needed to lead any project to its intended conclusion. Topics include project plans, managing expectations and contingencies, building a winning team, gaining commitments, managing project risks, and development of personal skills critical to the successful project manager.

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 404

Marketing, Sales, and Product Introduction

This course examines marketing and sales and the differences and details of these activities as applied within industry. The range of marketing types is covered to include business-to-business, industrial, commercial, retail, internet, social media, and entrepreneurial/professional. Sales fundamentals include understanding the customer and the competition, sales strategy, sales management, product positioning, product life cycle, sales structures, margins, and prospecting for new customers. Product development is addressed throughout the course inclusive of market feedback, product evaluation, opportunity assessment, prototyping, field trials and market testing, and product launch.

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 406**Quality Control**

This course focuses on how organizations manage quality in a competitive marketplace regardless of the nature of the industry. Topics include principles of quality, cost of quality, inspection and receiving, audits, corrective and preventive action systems, supplier performance management (SPM), FMEA and control plans, process capability studies and statistical process control (SPC), measurement system analysis, quality management systems (QMS), process improvement methodologies (Lean, Six Sigma, and Kaizen), and creation of a performance dashboard.

Lecture: 3 Lab: 0 Credits: 3

INTM 407**Construction Technology**

Introduces the full range of technologies involved in construction of both new and modified facilities, including steel, concrete and timber construction as well as supporting specialties such as HVAC, electrical, plumbing, etc. the interaction between the various construction trades will be covered along with the role of the architects and engineers.

Lecture: 3 Lab: 0 Credits: 3

INTM 408**Cost Management**

Accounting basics are introduced with primary emphasis on the costing and estimating procedures as used in industry. The objective of this course is to provide a good understanding of financial activities and hands-on experience in working with a variety of costing and accounting systems.

Lecture: 3 Lab: 0 Credits: 3

INTM 409**Inventory Control**

Fundamentals of inventory control including inventory classifications, i.e. raw materials, work-in-process (WIP), and finished goods. Topics include inventory record keeping, inventory turnover, the 80/20 (or ABC) approach, safety stock, forecasting, dependent and independent demand, lead times, excess/obsolete inventory, and inventory controls. Material Resource Planning (MRP) and Enterprise Resource Planning (ERP) are included.

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 410**Operations Management**

Focuses on core processes within an organization – the activities that add value. An operations strategy depends on the industrial sector as well as the organization. This course introduces a variety of qualitative and quantitative tools for such activities as project management, process analysis, job design, forecasting, resource planning, productivity, quality, inventory, and scheduling. The objective of this course is to provide the framework for integrating approaches covered in other INTM courses.

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 412**Manufacturing Processes for Metals and Mechanical Systems**

A broad range of manufacturing processes are studied including casting, forging, rolling, sheet metal processing, machining, joining, and non-traditional methods such as powder, EDM, and additive processes. Particular attention on interrelationships between manufacturing processes and properties developed in the work piece, both intended and unintended. Economic considerations and tradeoffs as well as computer-integrated manufacturing topics are also covered.

Lecture: 3 Lab: 0 Credits: 3

INTM 413**Contract Administration for Construction Projects**

This course covers fundamentals of project administration and characteristics of the construction industry. Pre-construction discussion includes technical and economic feasibility, project delivery systems, documents, bonding, and bidding. Duties and liabilities of parties at pre-contract stage and during contract administration to include scheduling and time extensions, payments, retainage, substantial and final completion, change orders, suspension of work, contract termination, and dispute resolution. Labor law, labor relations, safety, and general management of a construction company.

Lecture: 3 Lab: 0 Credits: 3

INTM 414**Topics in Industry**

Provides overview of multiple industrial sectors and the influences that are forcing change. All aspects of industry are considered: history of industry; inventory; supply chain; e-commerce; management; manufacturing; industrial facilities; resource management; electronics and chemical industries; alternate energies; marketing; entrepreneurship; computers as tools; and other specialty areas.

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 415**Advanced Project Management**

This course covers project management in the PMP framework and provides a structured approach to managing projects using Microsoft Project and Excel. Coverage includes creation of key project management charts (Gantt, Pert, CPM, timelines and resource utilization), basic statistics used in estimating task times, critical path generation in Excel and Project, project cost justification in Excel, SPC and acceptance sampling for machine acceptance, project analysis via simulation, and management of personnel, teams, subcontractors and vendors. Case studies are utilized to demonstrate core concepts and dynamic scheduling.

Lecture: 3 Lab: 0 Credits: 3

INTM 416**Integrated Facilities Management**

Integrated Facilities Management involves understanding processes and tools needed to successfully manage building systems, functions, and personnel in any type of building, complex of buildings, or physical environment. Course covers topics in facilities management ranging from routine maintenance to complex systems interactions and financial decisions. Students learn to assess issues of safety, human comfort, sustainable use of resources, building and infrastructure life cycles, and company objectives and develop solutions based on studying real problems in facilities management organizations.

Lecture: 3 Lab: 0 Credits: 3

INTM 417**Construction Estimating**

General approaches for estimating construction costs are covered. Several commercially available software packages are introduced. Emphasis is on acquiring the knowledge required to develop cost estimates for construction, renovation and maintenance projects for buildings, facilities and equipment.

Lecture: 3 Lab: 0 Credits: 3

INTM 418**Industrial Risk Management**

Each year, industrial companies are affected by critical incidents which cause disruption in operations and significant monetary losses due to repairs and/or lost revenue. Whether it is a small fire, an extended electrical outage or an incident of a more serious magnitude, all company stakeholders - from the board of directors to the employees to the customers - are impacted. The key to understanding the complexities of industrial resiliency lies in focusing on the issues of preparedness: prevention, mitigation, and control. This course is designed to prepare the student for managing a critical incident, including understanding risk and business impact, emergency preparedness, contingency planning and damage control.

Lecture: 3 Lab: 0 Credits: 3

INTM 420**Applied Strategies for the Competitive Enterprise**

Course covers the application of proven management principles and operational practices. Learn how high performance companies create a competitive advantage despite economic challenges and a transitional customer base. Factors covered include strategy deployment, financial analysis, new product development, quality, customer service, and attaining market leadership. Case studies illustrate variable impacts on business situations.

Lecture: 3 Lab: 0 Credits: 3

INTM 424**Management Information Systems**

Integration of all elements of manufacturing enterprise into a common database is critical to efficiency and profitability. This course details how Management Information Systems (MIS) tie together such operational aspects as order entry, production scheduling, quality control, shipping and collections.

Prerequisite(s): [(INTM 305)]

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 425**Human Resource Management**

This course will introduce students to key aspects of HR management, including legal requirements for all normal HR activities as well as techniques for dealing with employees when hiring, evaluating, promoting and terminating.

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 427**E-Commerce**

This course reviews electronic commerce and its role in industrial organizations. Topics include a history of e-commerce, business-to-business (B2B) models, and business-to-consumer (B2C) models. The impact of this paradigm shift on all aspects of business is also covered.

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 430**Transportation**

This course covers transportation practices and strategies for the 21st century. The role and importance of transportation in the economy and its relationship to the supply chain will be covered in detail. Transportation modes - trucks, rail, air, and water - will be examined for both domestic and global transportation. Costing and pricing strategies and issues will be discussed as well as security issues in domestic and international transportation.

Lecture: 3 Lab: 0 Credits: 3

INTM 431**Manufacturing Processes for Electronics and Electrical Systems**

The materials used in Electronic and Electrical (E&E) manufacturing will be reviewed including materials and components that are used to produce chips, PCBs, and wiring systems. Focus will be on the processes for producing the range of parts and products included in this broad sector. Automation for producing parts and assemblies will be covered. Techniques covered will include surface-mounted technology (SMT), wave soldering, automation insertion, automated inspection, etc. The industrial structure that makes up this sector of manufacturing will be covered.

Lecture: 3 Lab: 0 Credits: 3

INTM 432**Sales and Operations Planning**

This course covers sales and operations planning (S&OP) processes, objectives, and procedures utilized by leading global supply chain companies. Key elements of the S&OP process are explained, including demand plans, forecasts, and capacity plans. Students also learn how to develop, maintain, and manage supplier relationships (SRM) and how companies use customer relationship management (CRM) tools to enhance business relationships.

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 433**Chemical Manufacturing Processes in Industry**

This course provides an overview of current and emerging chemical processes employed in the energy, food, drug, and plastics sectors. Current and future impacts of various manufacturing processes on society, environment, and sustainability are covered as are issues related to OSHA, EPA, FDA, USDA, and other regulatory systems. The various implications of recovery and reuse are explored as well as new non-polluting, zero-emissions processes and technologies. Students will gain an appreciable understanding of "how it's made" and the range of chemical processes and related technical challenges involved in manufacturing. A background in chemistry is not required.

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 441**Supply Chain Management**

This course covers the full range of activities involved in the supply chain. This includes management tools for optimizing of supply chains, relationships with other parts of the organization, in-house versus third party approaches, and suitable performance measurements. Topics covered include: Warehouse Management Systems (WMS), Transportation Management Systems (TMS), Advanced Planning and Scheduling Systems (APS), as well as cost benefit analysis to determine the most appropriate approach.

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 442**Warehousing and Distribution**

This course covers warehouse layout and usage based on product requirements such as refrigeration, hazardous material, staging area, and value added activities. Processes covered include receiving, put-away, replenishment, picking and packing. The requirement for multiple trailer/rail cars loading and unloading is considered as well as equipment needed for loading, unloading, and storage. Computer systems for managing the operations are reviewed. Emphasis is on material handling from warehouse arrival through warehouse departure.

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 443**Purchasing**

Purchasing responsibilities, processes, and procedures are included. Topics covered include: supplier selection and administration, qualification of new suppliers, preparing purchase orders, negotiating price and delivery, strategic customer/vendor relationships, and resolution of problems. All aspects of Supplier Relation Management (SRM) are covered.

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 444**Export/Import**

Internationalization of industry requires special expertise and knowledge, which must be taken into consideration throughout all interactions with overseas companies either as customers or suppliers. Topics covered include custom clearance, bonded shipping, international shipping options, import financing and letters of credit, customer regulations, insurance, import duties and trade restrictions, exchange rates, and dealing with different cultures.

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 446**Manufacturing and Logistics Information Systems**

This course provides an overview of manufacturing and supply chain information systems, tools, and techniques utilized for effective decision making. Current state-of-the-art and commercially available industrial software packages, such as MRP, WMS, TMS, APS, etc., will be used and their impact on management decision making analyzed.

Lecture: 3 Lab: 0 Credits: 3

INTM 449**Telecommunications Over Data Networks**

This course covers a suite of application protocols known as Voice over IP (VoIP). It describes important protocols within that suite including RTP, SDP, MGCP and SIP, and the architecture of various VoIP installations including on-net to on-net, on-net to PSTN, and Inter-domain scenarios. The functions of the Network Elements that play significant roles in this architecture will be defined. Examples of network elements that are currently available as products will be examined.

Prerequisite(s): [(ITM 440) OR (ITM 540)]

Lecture: 3 Lab: 0 Credits: 3

INTM 459**Issues in Industrial Sustainability**

Examines the concept of sustainability and its application in the industrial environment. Identifies underlying stresses on natural and human environments and the resultant problems for business and society including legal, ethical, and political issues related to sustainability. Global warming, peak oil, and commodity pricing are considered as indicators of the need for improvements in sustainability. Industrial ecology will be discussed as well as strategies for developing sustainable practices in manufacturing, power generation, construction, architecture, logistics, and environmental quality. Coverage includes case studies on businesses that have developed successful sustainability programs.

Lecture: 3 Lab: 0 Credits: 3

INTM 460

Sustainability of Critical Materials

This course explores the limitations in supply and the need for sustainable use of carbon and non-carbon-based materials such as oil, minerals, food, water, and other natural resources used by industry. Limitations in the global availability of such resources pose challenges to industry which will require careful consideration and planning to ensure continued prosperity for current and future generations. Course will cover strategies and options to mitigate anticipated shortages and optimize the use of non-renewable natural resources, review of fuel and raw material pricing, and cost/benefit analysis of sustainable development proposals. Technical analyses will be presented during class discussions, but a technical background is not required.

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 461

Energy Options for Industry

Carbon-based fuels are a limited resource and within decades will be in very short supply. Associated energy costs will increase and industry will be required to incorporate alternate fuels and/or power sources, such as uranium (for nuclear power), hydroelectric, geothermal, wind, wave, solar, etc. This course presents such energy options and explores the anticipated impact on industry.

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 462

Special Topics in Sustainability

This course allows the student to research and report on an industrial sustainability issue of interest and relevance to their career objectives. Topics may touch on industrial ecology, ethics, regulations, environment, resource use, alternative manufacturing methods, facilities, logistics, etc. This is the fourth course in a specialization in Industrial Sustainability.

Lecture: 0 Lab: 0 Credits: 3

INTM 477

Entrepreneurship in Industry

Introduces various forms of entrepreneurship with emphasis towards industrial organizations. Provides helpful tools for developing and implementing significant "game-changing" actions to effect change within an existing organization or develop a new business venture. Students complete an opportunity assessment (OPASS) project wherein they identify, evaluate, and develop an approach for a "real-life" business and produce a formal report and presentation.

Lecture: 3 Lab: 0 Credits: 3

Satisfies: Communications (C)

INTM 491

Undergraduate Research

Undergraduate research.

Credit: Variable

INTM 497

Special Projects INTM

Special projects.

Credit: Variable

INTM 498

Undergraduate Research Experience

Team research experience; topic determined by supervising faculty.

Lecture: 0 Lab: 0 Credits: 3