

# Bachelor of Industrial Technology and Management

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**Department Web Site: [www.intm.iit.edu](http://www.intm.iit.edu)**

The objective of the Bachelor of Industrial Technology and Management (BINTM) program is to prepare skilled adults for managerial positions in industry. This is a completion program designed for working individuals who have technical training in manufacturing or industrial specialties. The program enables students to build upon existing skills, improve their managerial capabilities, and thereby expand their career opportunities.

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

The program offers four professional specializations: Industrial Facilities (IF), Industrial Logistics (IL), Manufacturing Technology (MT), and Telecommunication Technology (TT). Students have the option to complete a specialization or alternately take courses from more than one specialization area. The core curriculum covers material applicable to all industrial sectors. This approach allows students to optimize course selection in regards to individual career objectives.

The ideal candidate for this program is a person who is already working within or has a strong interest in these industries. This degree provides a broad background that 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. Nominally, a minimum of 60 semester hours from an accredited college is required 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 outstanding requirements be completed within two years. Candidates with more than 60 hours of transferable credit may qualify to have excess credit applied towards INTM coursework.

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

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## Faculty and Staff

### Program Director

Keith E. McKee  
312.567.3650

### Associate Director

Mazin Safar  
312.567.3624

### Faculty

Arditi, Ayman, Bobco, Caltagirone, Coates, Davis, Donahue, Feldy, Field, Foley, Footlik, Goldberg, Goldman, Gopal, Hoffman, Jain, Kumiega, Lemming, Levine, Lewis, Maurer, McKee, Nemeth, Prendergast, Rozansky, Safar, Shankar, Shields, Sud, Tijnunelis, Tomal, Twombly

### Program Coordinator

Pamela Houser  
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### Asst. Program Coordinator

Cynthia Spoor  
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## Admission Requirements

### Mathematics

Six credit hours at the level of college algebra or above.

### Computer Science

Three credit hours of computer programming.

### Natural Science

Eleven credit hours of science or engineering courses. Relevant courses include physics, chemistry or biology (physics highly recommended). Up to six credit hours may be in graphics/drafting. (It is preferred that two sequential courses be completed in a single field, and the third course be in a different field.) In some cases, certain technology courses may be applied to this requirement.

### Humanities and Social Sciences

Nine credit hours. Humanities courses include literature, philosophy (except logic) and history. Social sciences typically include anthropology, geography, political science, psychology, sociology and economics. A minimum of three credit hours in each category is required.

### Technical Coursework

Thirty-one credit hours. (Candidates with adequate college credit but lacking the technical coursework may qualify for admission based on a strong interest and/or experience in industrial technology.)

## Industrial Technology and Management Curriculum

A total of 126 credit hours are required for the bachelor's degree, consisting of 66 credits (22 courses) of junior- and senior-level courses completed at IIT and the 60 transfer credits required for admission. Students may attend on a part-time or full-time basis, understanding that INTM courses are generally offered evenings to accommodate full-time work schedules of students.

The core curriculum (14 courses) emphasizes proficiency in the essential functions of industrial enterprises with a focus on management-related topics. This coursework includes upper-level humanities and social science electives and an Interprofessional Project. Students also complete four (4) technical electives and four (4) specialization electives, which provide more in-depth coverage of specific aspects of industrial organizations and their related sectors. Students have the option to complete a formal specialization or alternately to choose electives from more than one specialization area.

Four industrial specializations are available:

### Industrial Facilities (IF)

Covers construction, project management, and renovation and maintenance of buildings, facilities and equipment.

### Industrial Logistics (IL)

Covers supply chain management, warehousing and distribution, purchasing, and export/import activities.

### Manufacturing Technology (MT)

Covers manufacturing processes, mechanical technology, quality control, and management information systems.

### Telecommunication Technology (TT)

Covers management and maintenance of data networks, network configurations, network security, and evolving technologies including Voice over IP.

## Industrial Technology and Management Curriculum

A suggested program based on half-time attendance. Students may complete coursework at their own pace.

Semester 1	Lect.	Lab. Hrs.	Cr. Hrs.
INTM 301 Communications for the Workplace	3	0	3
INTM 315 Industrial Enterprises	3	0	3
INTM 414 Topics in Industry	3	0	3
<b>Totals</b>	<b>9</b>	<b>0</b>	<b>9</b>

Semester 3	Lect.	Lab. Hrs.	Cr. Hrs.
INTM 404 Sales, Marketing and Product Introduction	3	0	3
Technical Elective	3	0	3
<b>Totals</b>	<b>6</b>	<b>0</b>	<b>6</b>

Semester 5	Lect.	Lab. Hrs.	Cr. Hrs.
INTM 409 Inventory Control	3	0	3
Technical Elective	3	0	3
Specialization Elective	3	0	3
<b>Totals</b>	<b>9</b>	<b>0</b>	<b>9</b>

Semester 7	Lect.	Lab. Hrs.	Cr. Hrs.
INTM 408 Cost Management	3	0	3
Specialization Elective	3	0	3
Humanities Elective	3	0	3
<b>Totals</b>	<b>9</b>	<b>0</b>	<b>9</b>

Semester 2	Lect.	Lab. Hrs.	Cr. Hrs.
INTM 410 Operations Management	3	0	3
Technical Elective	3	0	3
Humanities Elective	3	0	3
<b>Totals</b>	<b>9</b>	<b>0</b>	<b>9</b>

Semester 4	Lect.	Lab. Hrs.	Cr. Hrs.
INTM 477 Entrepreneurship in Industry	3	0	3
Technical Elective	3	0	3
Social Science Elective	3	0	3
<b>Totals</b>	<b>9</b>	<b>0</b>	<b>9</b>

Semester 6	Lect.	Lab. Hrs.	Cr. Hrs.
INTM 432 Vendor/Customer Relations	3	0	3
Specialization Elective	3	0	3
Social Science Elective	3	0	3
<b>Totals</b>	<b>9</b>	<b>0</b>	<b>9</b>

Semester 8	Lect.	Lab. Hrs.	Cr. Hrs.
IPro Project	1	6	3
Specialization Elective	3	0	3
<b>Totals</b>	<b>4</b>	<b>6</b>	<b>6</b>

**Total Credit Hours** **66**

**The Core Curriculum includes the following 14 courses:**

INTM 301 Communications for the Workplace  
INTM 315 Industrial Enterprises  
INTM 404 Sales, Marketing and Product Introduction  
INTM 408 Cost Management  
INTM 409 Inventory Control  
INTM 410 Operations Management

INTM 414 Topics in Industry  
INTM 432 Vendor/Customer Relations  
INTM 477 Entrepreneurship in Industry  
One (1) Interprofessional Project (IPRO) Course  
Two (2) 300- or 400-level Humanities Electives  
Two (2) 300- or 400-level Social Science Electives

**Technical Electives include (choose 4):**

INTM 314 Maintenance Technology and Management  
INTM 319 Electronics in Industry  
INTM 322 Industrial Project Management  
INTM 418 Industrial Risk Management  
INTM 425 Human Resource Management

INTM 427 E-Commerce  
INTM 441 Supply Chain Management  
INTM 446 Manufacturing and Logistics Information Systems  
INTM 461 Energy Options for Industry

**Specialization Electives include (choose 4 in one specialty or mix and match):**

**Industrial Facilities (IF)**

INTM 407 Construction Technology  
INTM 413 Facilities and Construction Management  
INTM 415 Advanced Project Management  
INTM 417 Construction Estimating

**Industrial Logistics (IL)**

INTM 430 Transportation  
INTM 442 Warehousing and Distribution  
INTM 443 Purchasing  
INTM 444 Export/Import Management

**Manufacturing Technology (MT)**

INTM 406 Quality Control in Manufacturing  
INTM 412 Manufacturing Processes  
INTM 422 Mechanical Technology  
INTM 431 Mfg. Processes: Electronics/Electrical Systems  
INTM 433 Mfg. Processes: Chemical/Process Systems

**Telecommunication Technology (TT)**

ITM 440 Introduction to Data Networks and the Internet  
ITM 441 Network Applications and Operations  
ITM 448 System and Network Security  
INTM 449 Telecommunications over Data Networks

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**Certificate in Industrial Technology and Management**

The three-course INTM Certificate provides an introduction to industrial organizations and how they operate. Students must complete the following courses:

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

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**Course Descriptions**

All courses earn three credits. (C) indicates course fulfills communications general education requirements.

**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 communications using electronic and traditional media. Credit not granted for both INTM 301 and COM 421. (C)

**INTM 315**

**Industrial Enterprises**

This course provides an introduction to the world of industrial enterprises. The worldwide evolution of business will be considered leading to today's competitive world. The range of industrial activities is reviewed, and students are introduced to the organization and purpose of various industrial sectors.

**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 for maintaining buildings, construction, and equipment installation and maintenance for all types of operations.

**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.

### **INTM 322**

#### **Industrial Project Management**

This course will teach the techniques for managing projects and programs of all types. Coverage includes organization and operation of the project team. Techniques for managing and tracking projects will be covered along with the computerized tools available for project management.

### **INTM 404**

#### **Sales, Marketing, and Product Introduction**

Covers techniques of marketing research, strategies for new product introduction, and sales management and planning. (C)

### **INTM 406**

#### **Quality Control in Manufacturing**

Topics include quality control based on metrology and overall quality control systems. Metrological techniques covered include mechanical, electrical, materials, and chemical perspectives. Such QC issues as SPC, ISO 9000, MilSpec and TQM are examined. Emphasis is on exploring options and consequences of selecting appropriate methodologies.

### **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 interactions between the various construction trades will be covered along with the role of the architects and engineers.

### **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.

### **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, external and internal lead times, excess/obsolete inventory, and inventory controls. Material Resource Planning (MRP) and Enterprise Resource Planning (ERP) are included. (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 advanced approaches covered in other INTM courses. (C)

### **INTM 412**

#### **Manufacturing Processes**

Process areas studied include metals, plastics, and electronics manufacturing. Key processes in each of these industries are explored, with particular consideration given to interactions between materials and processes, as well as related design issues.

### **INTM 413**

#### **Facilities and Construction Management**

Students learn about management of existing facilities including routine service and maintenance activities. Tools and techniques for managing new construction and renovation projects are covered, as well as organizational structures and management approaches for these activities.

### **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. (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.

### **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.

**INTM 418**

**Industrial Risk Management**

Industrial companies can be affected by critical incidents which cause disruptions in operations and significant monetary losses due to repairs and/or lost revenue. Be it a small fire, an extended electrical outage or a more serious incident, 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.

**INTM 422**

**Mechanical Technology**

This course reviews the technical fundamentals applicable to industrial operations and systems for mechanical components, subassemblies and products. The student surveys a broad range of topics starting from basic technical principles and continues through application of devices, systems and standards commonly encountered in industry.

**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.

**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. (C)

**INTM 430**

**Transportation**

This is a one term course covering 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 – truck, rail, air, and water – will be examined for both domestic and global transportation. Costing and pricing strategies and issues will be discussed. Security issues in domestic and international transportation will be part of the course. Lectures with years of practical transportation experience in the corporate world will provide students with their perspective on the role of transportation in today's economy.

**INTM 432**

**Vendor/Customer Relations**

Relations with customers and vendors constitute a critical aspect of company profitability. The course pursues such topics as appropriate involvement of customers and vendors in product development, as well as price and contract negotiations.

**INTM 431**

**Mfg. Processes: 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.

**INTM 433**

**Mfg. Processes for Chemical and Process Systems**

This course will cover materials and manufacturing based on process systems. This would include painting, anodizing, plating, plastic preparation, plastics manufacturing, cleaning, etc. along with the processes for producing the chemicals involved. Environmental and hazardous material issues are of importance and "green systems" that minimize the use of resources are encouraged. OSHA, EPA and other regulatory systems will be covered. The industrial structure that makes up this sector of manufacturing will be covered. (C)

**INTM 434**

**Industrial Futures**

This course allows a futuristic view of industrial establishments of interest to the student and INTM staff, who must work to develop an individual or group project. (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. (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/railcar 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. (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. (C)

**INTM 444**

**Export/Import Management**

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. (C)

**INTM 446**

**Manufacturing and Logistics Information Systems**

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

**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 currently available as products will be examined. Prerequisite: ITM 440 or ITM 540.

**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. (C)

**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. (C)

**IPRO Interprofessional Project**

IPRO projects develop communication, teamwork and leadership skills, as well as an awareness of economic, marketing, ethical and social issues within the framework of a multidisciplinary team project. Project teams are integrated across academic programs and at different levels within programs.

***\*Please note:** This information is compiled from IIT's current Undergraduate Programs Bulletin and includes recent department updates. The Undergraduate Programs Bulletin is the official university publication consulted when delineating or assessing a program of study.*