
Information Technology and Management - Center for Professional Development

Department Web site: www.iit.edu/cpd/itm/

Designed for students who have achieved an Associate's Degree and would like to complete a Bachelor's Degree, the objective of the Bachelor of Information Technology and Management program is to produce graduates prepared for a career in the information technology field, while equipping them with the critical thinking skills necessary to cope with the emergence of new technologies and with management principles needed to advance in their careers.

Government studies such as Free and Aspray, *The Supply of Information Technology Workers in the United States*, show that technology positions will be the fastest growing segment in the United States for the next thirty years. The purpose of the Bachelor of Information Technology & Management program is to provide students with up-to-date knowledge of the technologies that are being used in today's

work place. Courses are taught by professionals who work in the field and are in tune with changing information technologies.

Admission to the degree program is competitive. Admission is based on a review of college transcripts, documentation of work experience and an admission interview. Applicants must submit an application for admission as a degree-seeking student. The applicant must hold an associate's degree (AA) from an accredited college or the equivalent (completion of -60 credit hours). Only courses in which the student has earned a grade of "C" or better may be accepted for transfer. Supporting documentation to be included with the application includes official transcripts (or certified copies) of all college-level work.

Faculty & Staff

Program Director

C. Robert Carlson
Daniel F. and Ada L. Rice Campus room 132
630.682.6002 / carlson@iit.edu

Associate Program Director and Undergraduate Advisor

Ray Trygstad
630.682.6032 / trygstad@iit.edu

Program & Media Coordinator

Valerie Scarlata
630.682.6005 / scarlata@iit.edu

Assistant to the Director for Finance and Special Projects

Barbara Kozi
630.682.6040 / kozi@iit.edu

Assistant Program Director and Director, Forensics & Security Laboratory

William Lidinsky
630.682.6028 / lidinsky@iit.edu

Director, VoIP Laboratory

Carol Davids
630.682.6023 / davids@iit.edu

Industry Associate Professor

Kimont

Faculty

Carlson, Davids, Lidinsky, Scarlata, Trygstad

Part Time Faculty

Bartek, Fitzgerald, Friedman, Gehrs, Goins, P. Gupta,
Hajek, Hendry, D. Hood, Kandemir, M. Kozi,
Shamsuddin, Wakharia

Information Technology and Management

Admission Requirements

Admitted students are expected to have satisfied the following General Education Requirements prior to admission. If not, the student must complete them while working on the ITM degree. The degree requires 126 semester hours including transfer and coursework completed at IIT.

Basic Writing Proficiency Requirements

Students must take the IIT English Proficiency Examination before beginning classes at IIT. Within their first year at IIT, students who do not pass the IIT English Proficiency Examination must demonstrate basic writing proficiency by passing a composition course at IIT.

Natural Science or Engineering

Eleven semester hours of natural science or engineering courses. Relevant science courses include physics, chemistry, astronomy, or biology. In some cases, certain technology courses might be applied to this requirement.

Computer Science

Two semester hours of computer programming; may be satisfied by taking ITM 311.

Humanities and Social or Behavioral Sciences

Nine semester hours. Humanities include literature, philosophy (except logic), and history. Social or behavioral sciences typically include anthropology, geography, political science, psychology, sociology, and economics. Studies must include a minimum of three semester hours in Humanities and three semester hours in Social or Behavioral Sciences.

Mathematics

Five semester hours of mathematics at the level of Math 119 or above. Probability and Statistics is highly recommended.

Free or Technical Electives

Thirty-three semester hours of approved courses. Students should contact the Office of Educational Services for additional information.

Bachelor of Information Technology and Management

Students are required to take 66 semester hours at IIT and transfer 60 semester hours to complete the bachelor's degree for a total of 126 semester hours. This includes 16 information technology courses for a total of 48 semester hours in the major. An additional 18 semester hours outside the major must be taken at IIT in order to satisfy the remaining IIT General Education Requirements.

These include four 300/400 level humanities and social science electives and two IPRO courses. Students must also complete a minimum of 42 semester hours of courses with a significant written and oral communication component, identified with a (C) in the bulletin.

The computer science general education requirement may be satisfied by taking ITM 311.

ITM students completing a minor are strongly encouraged to consider minors which complement their primary program of study; these include (but are not limited to) Industrial Logistics; Industrial Facilities; Manufacturing Technology; Professional and Technical Communications; Management; Technology and Human Affairs; Circuits and Systems; Computer Architecture; and ROTC. Students entering the Bachelor of Information Technology and Management program as freshmen are required to complete a minor.

Bachelor of Information Technology and Management (Transfer, Part-Time Program)

Required Courses	Credit Hours
Courses Transferred (or taken at IIT)	60
Humanities Electives 300/400 level courses required	6
Social Science Electives 300/400 level courses required	6
Interprofessional Projects	6
ITM Requirements ITM 301, 302, 311, 312, 411, 421, 440, 448, 461, 471	30
ITM Electives	18
Total Hours	126

Information Technology and Management Curriculum

(students entering as transfer, part time)*

Semester 1	Credits	Semester 2	Credits
ITM 301 Contemporary Op Sys / Hardware I	3	ITM 302 Contemporary Op Sys / Hardware II	3
ITM 311 Introduction to Software Development	3	ITM 312 Introduction to Systems Software Programming	3
ITM 421 Data Modeling and Applications	3	Humanities Elective (300+)	3
Total Hours	9	Total Hours	9
Semester 3	Credits	Semester 4	Credits
ITM 440 Introduction to Data Networks and the Internet	3	ITM 461 Internet Technologies and Web Design	3
ITM 411 Intermediate Software Development	3	ITM 448 System and Network Security	3
Social Studies Elective (300+)	3	Humanities Elective (300+)	3
Total Hours	9	Total Hours	9
Semester 5	Credits	Semester 6	Credits
ITM Elective	3	ITM 471 Project Management for Info Technology	3
ITM Elective	3	I PRO 497 Interprofessional Project I	3
Social Studies Elective (300+)	3	ITM Elective	3
Total Hours	9	Total Hours	9
Semester 7	Credits	Semester 8	Credits
I PRO 497 Interprofessional Project II	3	ITM Elective	3
ITM Elective	3	ITM Elective	3
Total Hours	6	Total Hours	6
Total Credit Hours	66		

Information Technology and Management

Bachelor of Information Technology and Management (Freshman Program)

Required Courses	Credit Hours
ITM Requirements ITM 100, 301, 302, 311, 312, 411, 421, 440, 448, 461, 471	32
ITM Electives	18
Mathematics Requirements Two courses above MATH 119 including BUS 221 or PSYC 203	5
Engineering Requirement EG 225	3
Natural Science/Engineering Requirement For general education requirements, see page 27.	8
Humanities and Social Science For general education requirements, see page 27.	21
Psychology Requirement PSYC 301	3
Technical Communication Requirement COM 421	3
Interprofessional Projects	6
Minor Electives	15
Free Electives (may be used for additional ITM specialization)	12
Total Hours	126

Information Technology and Management

Information Technology Curriculum Specializations

The ITM electives may be chosen from one or more of the following course specializations:

Systems Security

Focuses on application, data, and network security and the management of information technology security.

- ITM 428 Database Security
- ITM 451 Distributed Workstation System Admin
- **OR**
- ITM 452 Client-Server System Administration
- ITM 458 Operating System Security
- ITM 478 Information Systems Security Management

Data Management

Focuses on the design, development and administration of traditional and Internet-based data management.

- ITM 414 Visual Programming Environments
- ITM 422 Advanced Database Management
- ITM 428 Database Security
- ITM 463 Internet Application Development

Internet Development and Electronic Commerce

Focuses on the design and development of fully-interactive Web sites and applications for Internet deployment.

- ITM 441 Network Applications and Operations
- ITM 462 Web Site Application Development
- ITM 463 Internet Application Development
- ITM 465 Dynamic Web Page Development
- ITM 466 XML Technologies and Web Services

IT Entrepreneurship and Management

Focuses on managerial and entrepreneurial skills needed to launch a new enterprise.

- ITM 441 Network Applications and Operations
- INTM 323 Industrial Management and Planning
- INTM 404 Sales, Marketing and Product Introduction
- INTM 408 Cost Management
- INTM 425 Human Resource Management

Software Development

Focuses on programming and the development of sophisticated applications.

- ITM 412 Advanced Structured/Sys Programming
- ITM 414 Visual Programming Environments
- ITM 415 Advanced Software Development
- ITM 462 Web Site Application Development
- ITM 478 Information System Security Management

System Administration

Focuses on the administration and management of servers.

- ITM 441 Network Applications and Operations
- ITM 451 Distributed Workstation System Admin
- **OR**
- ITM 452 Client-Server System Administration
- ITM 454 Operating System Virtualization
- **OR**
- ITM 458 Operating System Security
- ITM 456 Introduction to Open Source Operating Systems

Networking and Communications

Focuses on Network Applications and management.

- ITM 441 Network Applications and Operations
- ITM 451 Distributed Workstation System Admin
- **OR**
- ITM 452 Client-Server System Administration
- ITM 478 Information System Security Management
- ITM 491 Undergraduate Research

IIT/College of DuPage and IIT/Joliet Junior College Dual Admissions Programs

Students who meet the requirements of the Dual Admissions Program (DAP) may enroll simultaneously at the College of DuPage (COD) or Joliet Junior College (JJC) and IIT. Students accepted into the DAP will have access to advising and other services from both institutions. Students who successfully complete the institutional course requirements of both institutions under the DAP will be awarded an Associate's Degree from COD and a Bachelor of Information Technology and Management from IIT.

Eligibility for the program

Students applying to the DAP must be enrolled in one of the following programs:

At COD: Associate of Applied Science Degree in Computer Information Systems or Associate of Applied Science Degree in Computer Internetworking Technologies

At JJC: Associate of Applied Science Degree in Computer Information Systems; Network Specialist, Programming or Web Design and Administration Options

Students must have and maintain a cumulative grade point average of at least 3.0 at COD or JJC to be eligible for admission to IIT. Students must make satisfactory academic progress at COD, as defined by COD, or at JJC, as defined by JJC.

Application process

Applicants must complete a Statement of Intent form, which permits the exchange of academic admission and advising information between IIT and COD or JJC. Applicants must also complete the application process at both COD or JJC and IIT in order to be admitted to both institutions. The IIT application may be submitted only for a bachelor's program in Information Technology and Management. Admission to other IIT programs may have additional requirements that are outside the scope of the program.

Academic Program Requirements

Students must follow each institution's policies regarding admission, course enrollment, transfer hours, probation, dismissal and re-instatement. Transcripts must be sent to the IIT Office of Educational Services each semester for each student attending COD or JJC and enrolled in the DAP. IIT will provide COD and JJC with major and course updates, course prerequisites and program requirements for the Information Technology and Management bachelor's degree completion program.

Graduation Requirements

Students enrolled in the DAP must follow the COD or JJC catalog to satisfy requirements for the Associate's Degree and the requirements set out in the IIT Undergraduate Bulletin in effect at the time of admission into the DAP for the Baccalaureate Degree.

Information Technology and Management — Center for Professional Development

ITM 300 Communication in the Workplace

Review, analyze and practice verbal and written communication formats found in the workplace. Emphasis on developing skills in technical writing and oral presentations using electronic and traditional media. Credit not granted for both ITM 300 and COM 421; INTM 301 may be substituted for this course. (3-0-3) (C)

ITM 301 Introduction to Contemporary Operating Systems & Hardware I

Students study the basics of computer architecture and learn to use a contemporary operating system. Hardware requirements, micro-computer components, software compatibility and system installation and options are covered, along with post-installation topics, storage, security, and system diagnosis and repair. (2-2-3)

ITM 302 Introduction to Contemporary Operating Systems II

Introduces features of an advanced operating system, including basic commands, file and directory manipulation, text editing and suitability for server applications. Basic programming in this environment will be addressed through shell scripting for job automation along with shell built-in data types, condition, loops, functions and regular expressions. (2-2-3)

ITM 311 Introduction to Software Development

A broad introduction to object-oriented programming and the related knowledge necessary to program in a contemporary programming language. This would include coverage of an Application Development Kit, creating stand-alone applications and applets for enhancing Web pages. (2-2-3)

ITM 312 Introduction to Systems Software Programming

Introduces basic concepts of systems programming. Students learn to apply basic programming concepts toward solving problems, create source files and header files, work with and effectively use basic data types, compile source code into binary executable files, and understand use of the “make” utility for project management. (2-2-3)

ITM 411 Intermediate Software Development

This course covers a broad spectrum of object-oriented programming concepts and application programming interfaces. The student considers the details of object-oriented development in topics of multi-threading, data structure collections, stream I/O and client interfaces. Software engineering topics of packaging and deployment are covered as well. Hands-on exercises reinforce concepts taught throughout the course. Prerequisite: ITM 311 (2-2-3)

ITM 412 Advanced Structured and Systems Programming

Structured programming continues with advanced concepts including strings, arrays, pointers, data structures, file manipulation, and dynamic memory management. Students create more complex applications that work with user input, manipulate user supplied text or text obtained from a file, apply standard library routines for working with literal text, use pointers to store complex structures within arrays, and read and write data from files, the console, and the terminal. The object-oriented programming (OOP) paradigm is covered in depth including the philosophy of OOP, classes and objects, inheritance, template classes, and making use of class libraries. Prerequisite: ITM 312 (2-2-3)

ITM 414 Visual Programming Environments

Students will study the fundamental problems associated with man-machine interfaces. Students will learn to apply several GUI techniques to design, lay out and implement screen controls, menus and graphical objects using techniques such as logic flow and input validation. GUI programming elements of contemporary visual programming languages are introduced. Prerequisites: ITM 311 or ITM 312 (2-2-3)

ITM 415 Advanced Software Development

This course considers Web container application development for enterprise systems. The primary focus is on database connectivity (JDBC) integration with Web application programming using an enterprise-level application framework. A Web application term project considers the design and implementation of a database instance that serves as the information tier in a contemporary 3-tier enterprise solution. Prerequisite: ITM 411 (2-2-3)

ITM 421 Data Modeling and Applications

Basic data modeling concepts are introduced. Hands-on database design, implementation, and administration of single-user and shared multi-user database applications using a contemporary relational database management system. (2-2-3)

ITM 422 Advanced Database Management

Advanced topics in database management and programming including client server application development are introduced. Expands knowledge of data modeling concepts and introduces object-oriented data modeling techniques. Students will learn the use of Structured Query Language in a variety of application and operating system environments. Prerequisite: ITM 421 (3-0-3) (C)

ITM 423 Advanced Database Management II

Students will learn how to design and develop Client/Server database applications for various business solutions, incorporating Client/Server application design. Business system planning, analysis, development and implementation are discussed. Students will learn how to design event-driven applications utilizing application management tools as well as use of graphical user interface design to create user-friendly applications. Prerequisite: ITM 422 (3-0-3) (C)

ITM 428 Database Security

Students will engage in an in-depth examination of topics in data security including security considerations in applications & systems development, encryption methods, cryptography law and security architecture & models. Prerequisite: ITM 421 (3-0-3)

ITM 440 Introduction to Data Networks and the Internet

This course covers current and evolving data network technologies, protocols, network components, and the networks that use them, focusing on the Internet and related LANs. The state of worldwide networking and its evolution will be discussed. This course covers the Internet architecture, organization, and protocols including Ethernet, 802.11, routing, the TCP/UDP/IP suite, DNS, Bluetooth, SNMP, DHCP, and more. Students will be presented with Internet-specific networking tools for searching, testing, debugging, and configuring networks and network-connected host computers. There will be opportunities for network configuration and hands-on use of tools. (2-2-3)

ITM 441 Network Applications and Operations

Students learn the details, use, and configuration of network applications. Currently protocols and application technologies considered include SNMP, SMTP, IMAP, POP, MIME, BOOTP, DHCP, SAMBA, NFS, AFS, X, HTTP, DNS, NetBIOS, and CIFS/SMB. Windows workgroups and domains: file and printer sharing, remote access, and the Windows Network Neighborhood are addressed. Prerequisite: ITM 440. (2-2-3)

ITM 443 Vulnerability Analysis and Control

This course addresses hands-on ethical hacking, penetration testing, detection of malicious probes and their prevention. It provides students with in-depth theoretical and practical knowledge of the vulnerabilities of networks of computers including the networks themselves, operating systems and important applications. Integrated with the lectures are laboratories focusing on use of open source and freeware tools; students will learn in a closed environment to probe, penetrate and hack other networks. Prerequisite: ITM 440 (2-2-3)

ITM 448 System and Network Security

Prepares students for a role as a network security administrator and analyst. Topics include viruses, worms, other attack mechanisms, vulnerabilities and countermeasures, network security protocols, encryption, identity and authentication, scanning, firewalls, security tools, and organizations addressing security. A key component of this course is a self-contained team project. Prerequisite: ITM 440 (2-2-3) (C)

ITM 451 Distributed Workstation System Administration

Students learn to set up and maintain PC workstations and servers and to administer PC servers and networks. Topics include hardware requirements; software compatibility; and system installation, configuration and options and post-installation topics; administrative practices required for file system security; process management; performance monitoring and tuning; storage management; back-up and restoration of data; and disaster recovery and prevention. Prerequisite: ITM 301 (4-4-6)

ITM 452 Client-Server System Administration

Students learn to setup and configure a contemporary operating system, including the actual installation of the operating system on the student workstation, in a networked client-server environment. User account management, security, printing, disk configuration, and backup procedures are addressed, with particular attention to coverage of TCP/IP and TCP/IP applications. System installation, configuration and administration issues as well as network file systems, network access and compatibility with other operating systems are also addressed. Prerequisite: ITM 302 (4-4-6)

ITM 454 Operating System Virtualization

This course will cover technologies allowing multiple instances of operating systems to be run on a single physical system. Concepts addressed will include hypervisors, virtual machines, paravirtualization and virtual appliances. Both server and desktop virtualization will be examined in detail, with brief coverage of storage virtualization and application virtualization. Business benefits, business cases and security implications of virtualization will be discussed. Extensive hands-on assignments and a group project will allow students to gain firsthand experience of this technology. Prerequisite: ITM 301 or ITM 302 or instructor permission. (2-2-3)

ITM 456 Introduction to Open Source Operating Systems

Students learn to set up and configure an industry-standard open source operating system, including the actual installation of the operating system on the student workstation. Also addressed are applications and graphical user interfaces as well as support issues for open source software. Prerequisite: ITM 302 or permission of instructor (2-2-3)

ITM 458 Operating System Security

This course will address theoretical concepts of operating system security, security architectures of current operating systems, and details of security implementation using best practices to configure operating systems to industry security standards. Server configuration, system-level firewalls, file system security, logging, anti-virus and anti-spyware measures and other operating system security strategies will be examined. Prerequisite: ITM 301 or ITM 302 (2-2-3)

ITM 460 Fundamentals of Multimedia

Students are introduced to computer-based multimedia theory, concepts and applications. Topics include desktop publishing, hypermedia, presentation graphics, graphic images, animation, sound, video, multimedia on the World Wide Web and integrated multimedia authoring techniques. (2-2-3) (C)

ITM 461 Internet Technologies & Web Design

This course will cover how the Internet is organized, addressing, routing, DNS, protocols, TCP/IP, SMTP, the use of Internet applications, and the creation of Web pages using HTML and graphical applications. Networked multimedia distribution technologies are also explored. The design of effective Web site including page layout, user interface design, graphic design, content flow and site structure as well as management of Web site resources including intranet management and design considerations are addressed. Students design and create a major Web site with multiple pages and cross-linked structures. (2-2-3) (C)

ITM 462 Web Site Application Development

Programming the Common Gateway Interface (CGI) for Web pages is introduced with emphasis on creation of interfaces to handle Web-based form data. CGI programming is taught in multiple languages. Security of Web sites is covered with an emphasis on controlled access sites. Setup, administration and customization of content management systems including blog and portal sites is introduced. Students design and create a major Web site with including basic CGI programs with Web interfaces and process data flows from online forms with basic database structures. Prerequisite: ITM 461 (2-2-3) (C)

Course Descriptions

ITM 463 Internet Application Development

In-depth examination of the concepts involved in the development of Internet applications. Students will learn the differences and similarities between Internet applications and traditional client/ server applications. A discussion of the technologies involved in creating these Internet applications is included, and students will learn to use these technologies to create robust server-side applications. Also addressed is the role of the Application Service Provider (ASP) in enterprise information technology management. Prerequisites: ITM 461, ITM 411 (2-2-3)

ITM 465 Dynamic Web Page Development

Students will learn the W3C and major vendors' Document Object Models (DOM) and how to use scripting syntax and techniques to make use of the DOM in the preparation of dynamic web pages. The role of Cascading Style Sheets in dynamic pages will also be covered in detail. Prerequisite: ITM 461 (2-2-3)

ITM 466 XML Technologies and Web Services

The course is a broad survey of XML and Web Services technologies. The student considers these technologies in the development of narrative-centric and data-centric applications within an open-standard, message-based enterprise framework. Web feeds, aggregators, mashups and XML application servers are also treated. A final project will consider best practices in utilizing XML technologies and web services for enterprise web applications. Prerequisites: ITM 411 and ITM 461 (3-0-3)

ITM 471 Project Management for Information Technology

Basic principles of project management are taught with a particular focus on project planning for information technology hardware, software and networking project implementation. Management of application development and major Web development projects will also be addressed. (3-0-3) (C)

ITM 478 Information System Security Management

In-depth examination of topics in the management of information technology security including access control systems and methodology, business continuity and disaster recovery planning, legal issues in information system security, ethics, computer operations security, physical security and security architecture and models using current standards and models. (3-0-3) (C)

ITM 491 Undergraduate Research

Prerequisite: written consent of instructor (Credit: variable)

ITM 492 Embedded Systems & Reconfigurable Logic Design

This accelerated course covers embedded system design fundamentals. Working with various microcontrollers, microprocessors, and DSPs, students will discover hardware, software and firmware design trade-offs, tool chains, and best practices in current embedded systems development. Laboratory exercise and experience reinforce the lecture concepts. A course project encapsulates all topics culminating in an embedded system designed and implemented from the ground up. The student should be familiar with analog and digital design methods, computer architecture and structured/procedural programming techniques. Prerequisite: Knowledge of digital logic and C or consent of instructor. (4-4-6)

ITM 495 Topics in Information Technology

This course will cover a particular topic, varying from semester to semester, in which there is particular student or staff interest. Prerequisite: consent of instructor (Credit: variable) (C)

GRADUATE COURSES

The following graduate courses may be available to degree-seeking under-graduate students with approval of the course instructor and faculty advisor. See the current *IIT Bulletin: Graduate Programs* for full descriptions

ITM 511 Application Development Methodologies

ITM 518 Coding Security

ITM 521 Client Server Technologies and Applications

ITM 526 Data Warehousing

ITM 527 Data Financials

ITM 531 Object Oriented System Analysis, Modeling and Design

ITM 532 UML Based Software Development

ITM 533 Operating System Design Implementation

ITM 534 Human Computer Interaction

ITM 535 Systems Architectures

ITM 537 Instructional Technologies

ITM 539 Steganography

ITM 542 Wireless Technologies and Applications

ITM 543 Vulnerability Analysis and Control

ITM 545 Telecommunications Technology

ITM 546 Telecommunications Over Data Networks

ITM 547 Telecommunications Over Data Networks: Projects & Advanced Methods

ITM 549 System and Network Security: Projects and Advanced Methods

ITM 555 Handheld Device Technologies

ITM 564 Electronic Commerce Applications and Management

ITM 566 Service-Oriented Architecture and Enterprise Service Bus

ITM 567 Enterprise Web Application Development

ITM 572 Process Engineering for Information Technology Managers

ITM 573 Building and Leading Effective Teams

ITM 574 Strategic Information Technology Management

ITM 575 Networking and Telecommunications Management

ITM 581 IT Entrepreneurship

ITM 582 Business Innovation

ITM 585 Legal and Ethical Issues in Information Technology

ITM 588 Incident Response, Disaster Recovery and Business Continuity

ITM 593 Embedded Systems