

ILLINOIS INSTITUTE OF TECHNOLOGY

THIS IS **IIT**

Bulletin:
Undergraduate Programs
2012–2014



Information Technology and Management– School of Applied Technology

Department Website: www.iit.edu/cpd/itm

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Dean and Program Director

C. Robert Carlson

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Ray Trygstad

The objective of the Bachelor of Information Technology and Management degree 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. While the program was originally designed for students who have achieved an Associate's degree and would like to complete a Bachelor's degree, students may also enter the program as first-year students.

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 30 years. Organizations of all kinds have become dependent on networked computing infrastructure as the key element to enabling modern business processes, and our graduates are prepared to select, manage, and maintain that infrastructure, ensuring that it meets organizational needs. Information technology professionals assume responsibility for selecting hardware and software products appropriate for an organization, integrating those products with organizational needs and infrastructure, and installing, customizing, and maintaining those applications for the organization's computer users. Planning and managing an organization's technology infrastructure is a difficult and complex job that requires a solid foundation in applied computing as well as management and people skills. Professionals in this discipline require special skills, such as understanding how networked systems are composed and structured and what their strengths and weaknesses are, and being prepared to deal with important software systems concerns such as reliability, security, usability, and effectiveness and efficiency for their intended purpose. These topics are difficult and intellectually demanding.

The Bachelor of Information Technology and Management degree program produces graduates who:

- Advocate for users and meet their needs within an organizational and societal context through the selection, creation, application, integration, and administration of computing technologies.
- Provide integrated technology solutions for business, government, healthcare, schools, and other organizations.
- Exhibit current knowledge of the technologies that are in use in today's workplace.
- Make information technology work in a wide range of settings.
- Create digital content for the technology infrastructure.
- Provide support to individuals who use the technology infrastructure.

To meet these goals, graduates must demonstrate knowledge and proficiency in these areas:

- Information technology basics including hardware and operating systems
- Application development and programming
- Human-computer interaction
- Databases and data management
- Networking and communications
- Websystems
- Cybersecurity
- Professionalism

Entering the program as a first-year student requires the completion of additional courses in technical communication, psychology, engineering graphics, and a minor. The minor may be in a field which will complement information technology such as business or professional and technical communication, or may be chosen from a field very different such as history or sociology to provide a more widely rounded educational experience.

Admission for transfer students is based on a review of college transcripts and documentation of work experience. Applicants must submit an application for admission as a degree-seeking student. Transfer applicants must hold an Associate's degree (A.A.) 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 of all college-level work.

Faculty

Professor

C. R. Carlson

Industry Professors

C. Davids, R. Hendry, W. Lidinsky, R. Trygstad

Industry Associate Professor

J. Hajek

Adjunct Industry Professors

A. Friedman, B. Goins, P. Gupta, D. Hood, N. Joiner, W. Slater, K. Vaccaro

Adjunct Industry Associate Professors

M. England, D. Hasenfang, P. Huang, R. Kandemir, M. Kozi, J. Meyers, S. Shamsuddin, R. VanDame

Adjunct Instructors

B. Bailey, S. Haurberg, L. McHugh

Transfer Admission Requirements

Admitted transfer 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

a minimum of 129 semester hours including transfer and coursework completed at IIT. A maximum of 68 applicable semester hours of transfer credit is permitted from a two-year college.

Basic Writing Proficiency Requirement

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. Two sequential courses must be from the same field and one must be from another field. In some cases, certain technology courses might be applied to this requirement.

Computer Science

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

Humanities and Social Science

Twelve 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 six semester hours in the social sciences.

Mathematics

Five semester hours of mathematics at the level of MATH 119 or above; probability and statistics is highly recommended. Students who enter the program with less than 60 hours of total transfer credit or less than five hours of mathematics credit will be required to take BUS 221 – Statistics for Managerial Decision Making.

Free or Technical Electives

Thirty-three semester hours of approved courses. Students should contact the Office of Undergraduate Academic Affairs for additional information.

Bachelor of Information Technology and Management

Transfer students are required to take 66 semester hours at IIT and transfer 63 semester hours to complete the Bachelor's degree for a total of 129 semester hours. This includes 17 information technology courses for a total of 51 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 three 300/400-level humanities and social sciences electives and two IPRO courses. Two social sciences electives must be from the same field and one must be from a different field; lower-level social sciences electives count towards this requirement. The computer science general education requirement may be satisfied by completion of ITM 311. Students who enter the program with less than 60 hours of total transfer credit or less than five hours of mathematics credit will be required to take BUS 221 – Statistics for Managerial Decision Making.

All students must complete a minimum of 42 semester hours of courses with a significant written and oral communication component, identified with a (C) in the bulletin; 15 hours of (C)-coded courses must be taken in the major.

Entering the Bachelor of Information Technology and Management program as a first-year student requires com-

pletion of 126 to 130 hours of coursework (depending on mathematics placement) which must include a minor. 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) Business, Professional and Technical Communications; Circuits and Systems; Computer Architecture; and ROTC. Courses taken to fulfill a minor requirement may not also be used as electives in the major.

Current IIT students, who entered as first-year students, and are changing their major to Information Technology and Management from another major are expected to meet the same requirements as students entering the Bachelor of Information Technology and Management program as first-year students, except that the minor requirement may be waived.

A maximum of nine hours of ITM graduate courses taken as an undergraduate may be applied to the Master of Information Technology and Management degree, and any graduate courses taken to fulfill undergraduate degree requirements may not also be applied to a graduate degree unless the student is enrolled in a co-terminal Master's degree program.

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

Required Courses	Credit Hours
Courses Transferred (or taken at IIT)	63
Humanities Electives 300/400-level courses	6
Social Sciences Elective 300/400-level course	3
Interprofessional Projects	6
ITM Requirements ITM 301, 302, 311, 312, ITMD 411, 421, 461 ITMM 471, ITMO, 440, ITMS 448, ITMT 434	33
ITM Electives Select from ITM, ITMD, ITMM, ITMO, ITMS, ITMT, and TECH	18
Total Hours	129

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	Intro to Software Development	3	ITM 312	Intro to Systems Software Programming	3
ITMD 421	Data Modeling and Applications	3	Humanities Elective (300+)		3
Total Hours		9	Total Hours		9
Semester 3		Credits	Semester 4		Credits
ITMO 440	Intro to Data Networks and the Internet	3	ITMD 461	Internet Technologies and Web Design	3
ITMD 441	Intermediate Software Development	3	ITMS 448	Systems and Network Security	3
Total Hours		6	Humanities Elective (300+)		3
			Total Hours		9
Semester 5		Credits	Semester 6		Credits
ITMT 434	Human/Computer Interaction	3	ITMM 471	Project Management for Info Technology	3
ITM Elective		3	IPro Elective I		3
Social Sciences Elective (300+)		3	ITM Elective		3
Total Hours		9	Total Hours		9
Semester 7		Credits	Semester 8		Credits
IPro Elective II		3	ITM Elective		3
ITM Elective		3	ITM Elective		3
ITM Elective		3	Total Hours		6
Total Hours		9			
Total Credit Hours		66			

Bachelor of Information Technology and Management (Program for First-Year Students)

Required Courses	Credit Hours
ITM Requirements ITM 100, 301, 302, 311, 312, ITMD 411, 421, 461, ITMM 471, ITMO 440, ITMS 448, ITMT 434	35
ITM Electives Select from ITMD, ITMM, ITMO, ITMS, ITMT, and TECH	18
Mathematics Requirements (MATH 130 and 425) or (MATH 148 and 149) or MATH 151) and a statistics elective	8/12
Engineering Requirement EG 225	3
Natural Science and Engineering Requirements For general education requirements, see page 25.	8
Humanities and Social Sciences Requirements	21
Psychology Requirement PSYC 301 (May count toward upper-level social sciences requirement)	3
Technical Communication Requirement COM 421	3
Interprofessional Projects	6
Minor Electives	15
Free Electives	6
Total Hours	126/130

Information Technology and Management Curriculum

(Program for First-Year Students)

Semester 1	Credits
EG 225 Engineering Graphics for Non-Engineers	3
First-year MATH sequence Elective*	3/5
Natural Science or Engineering Elective	4
Humanities or Social Sciences Elective	3
Total Hours	13/15

Semester 2	Credits
ITM 100 Introduction to the Profession	2
ITM 301 Contemporary Op Sys/Hardware I	3
ITM 311 Intro to Software Development	3
First-year MATH sequence Elective*	3/5
Natural Science or Engineering Elective	4
Total Hours	15/17

Semester 3	Credits
ITM 302 Contemporary Op Sys/Hardware II	3
ITM 312 Introduction to Systems Software Prog	3
ITM Elective	3
ITM Elective	3
Humanities 100-level Elective	3
Social Sciences Elective	3
Total Hours	18

Semester 4	Credits
ITMD 411 Intermediate Software Development	3
ITMT 434 Human/Computer Interaction	3
ITM Elective	3
Statistics Elective (MATH 425, BUS 221, PSYC 203)	3
Minor Elective	3
Total Hours	15

Semester 5	Credits
ITMM 440 Intro to Data Networks and the Internet	3
ITMO 471 Project Management for Info Technology	3
PSYC 301 Industrial Psychology	3
Minor Elective	3
Humanities Elective (300+)	3
Free Elective	2
Total Hours	17

Semester 6	Credits
ITMD 421 Data Modeling and Applications	3
ITMD 461 Internet Technologies & Web Design	3
COM 421 Technical Writing	3
IPro Elective I	3
Social Sciences Elective	3
Minor Elective	3
Total Hours	18

Semester 7	Credits
ITMS 448 System and Network Security	3
ITM Elective	3
Minor Elective	3
Humanities Elective (300+)	3
Free Elective	3
Total Hours	15

Semester 8	Credits
IPro Elective II	3
ITM Elective	3
ITM Elective	3
Minor Elective	3
Social Sciences Elective (300+)	3
Total Hours	15

Total Credit Hours **126/130**

* Choose from (MATH 130 and 425) or (MATH 148 and 149) or MATH 151.

Information Technology Curriculum Specializations

The ITM electives may be chosen from one or more of the following course specializations. ITM required courses may not be counted toward completion of elective requirements

for specializations. With the permission of the advisor, other undergraduate or graduate courses in the same area may be substituted for courses in a specialization.

Systems Security

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

ITMS 478 Cyber Security Management

AND *select one course from the following:*

ITMO 451 Distributed Workstation System Administration

ITMO 452 Client-Server System Administration

ITMO 456 Introduction to Open Source Operating Systems

AND *any two ITMS electives.*

Data Management

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

ITMD 422 Advanced Database Management

ITMS 428 Database Security

AND *select two courses from the following:*

ITMO 444 Cloud Computing Technologies

OR *any ITMD elective(s).*

Web Design and Application Development

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

ITMO 441 Network Applications and Operations

ITMD 462 Web Site Application Development

AND *select two courses from the following:*

ITMO 444 Cloud Computing Technologies

ITMD 455 Intelligent Device Applications

ITMD 463 Intermediate Web Site Application Development

ITMD 464 Advanced Web Site Application Development

ITMD 465 Rich Internet Applications

ITMD 466 Service Oriented Architecture

ITMD 469 Topics in Application Development

IT Entrepreneurship and Management

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

ITMM 470 Fundamentals of Management for Technical Professionals

ITMM 481 IT Entrepreneurship

AND *select any two courses from ITMM or the following:*

BUS 100 Introduction to Business

ECON 151 Making Strategic Decisions in the Marketplace

OR *any BUS elective at the 200-level or above.*

Software Development

Focuses on programming and the development of sophisticated applications.

ITMD 415 Advanced Software Development

ITMD 462 Web Site Application Development

AND *select one course from the following:*

ITMD 412 Advanced Structured & Systems Programming

ITMD 413 Open Source Programming

ITMD 419 Topics in Software Development

ITMD 455 Intelligent Device Applications

AND *any ITMD elective.*

System Administration

Focuses on the administration and the management of servers.

ITMO 441 Network Applications and Operations

AND *select one course from the following:*

ITMO 451 Distributed Workstation System Administration

ITMO 452 Client-Server System Administration

AND *select two courses from the following:*

ITMO 444 Cloud Computing Technologies

ITMO 454 Operating System Virtualization

ITMO 456 Introduction to Open Source Operating Systems

ITMS 458 Operating System Security

Networking and Communications

Focuses on network applications and management.

ITMO 441 Network Applications and Operations

AND *select one course from the following:*

ITMO 451 Distributed Workstation System Administration

ITMO 452 Client-Server System Administration

ITMO 456 Introduction to Open Source Operating Systems

AND *select any two courses from ITMO, ITMT,*

or the following:

ITMS 443 Vulnerability Analysis and Control

ITMD 465 Rich Internet Applications

ITMS 478 Cyber Security Management

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 or JJC 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 GPA of at least 3.00 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 Undergraduate Academic Affairs 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 Bachelor's degree.

Information Technology and Management

ITM 100

Introduction to Information Technology as a Profession

This course introduces students to the steps necessary to analyze a problem in information technology and identify and define the computing requirements appropriate to its solution, with a focus on how to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs. Students learn to analyze the local and global impact of computing on individuals, organizations, and society. This course leads students to recognize the need for continuing professional development and imparts an understanding of professional, ethical, legal, security and social issues, and responsibilities in information technology. Students write and present, building their ability to communicate effectively with a range of audiences, and work in teams learning to function effectively together to accomplish a common goal.

(2-0-2) (C)

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.

(0-0-3) (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, hardware components, software compatibility, and system installation topics are covered along with post-installation, storage, security and system diagnosis, and repair. Topics also include discussion of current and future technology industry trends.

(2-2-3)

ITM 302

Introduction to Contemporary Operating Systems & Hardware 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, a standard integrated Development environment, and the use of GUI components.

(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 implement header files, work with and effectively use basic data types, abstract data types, control structures, code modularization and arrays. Students will be introduced to object paradigm including, classes, inheritance, and polymorphism applications.

(2-2-3)

ITM 497

Independent Study

Special projects.

(Credit: Variable)

Information Technology and Management: Development

ITMD 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-orientated 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(s): [(ITM 311)]

(2-2-3)

ITMD 412

Advanced Structured & 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(s): [(ITM 312)]

(2-2-3)

ITMD 413

Open Source Programming

Contemporary open-source programming languages and frameworks are presented. The student considers design and development topics in system, graphical user interface, network, and web programming. Dynamic scripting languages are covered using object-oriented, concurrent, and functional programming paradigms. Concepts gained throughout the course are reinforced with numerous exercises which will culminate in an open-source programming project.

Prerequisite(s): [(ITM 411) OR (ITMD 411)]

(2-2-3)

ITMD 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(s): [(ITM 411) OR (ITMD 411)]

(2-2-3)

ITMD 419

Topics in Software Development

This course will cover a particular topic in software development, varying from semester to semester, in which there is particular student or staff interest. This course may be taken more than once but only 9 hours of ITM 419/519 or ITMD 419/519 credit may be applied to a degree.

(Credit: Variable)

ITMD 421**Data Modeling & 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)

ITMD 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(s): [(ITM 421) OR (ITM 421)]
(3-0-3) (C)

ITMD 434**Human/Computer Interaction**

Introduction to human-computer interaction, a discipline concerned with the design, evaluation, and implementation of interactive computing systems for human use. Emphasis is given to the structure of communication between people and computers, capabilities of people to use computers, concerns that arise in designing and building interfaces, design trade-offs, and the process of specification, design, and implementation of user interfaces. Particular emphasis is placed on practical design and usability of computer system user interfaces.
(3-0-3)

ITMD 455**Intelligent Device Applications**

Intelligent device application development is covered with various technologies on mobile and robotic platforms. Utilizing contemporary toolkits, the student considers design and development on emulated and real "smart" devices including smart phones, personal digital assistants, sensors, actuators, and robots. Numerous exercises reinforce concepts gained throughout the course. A term project will integrate course topics into a comprehensive intelligent device application. This course may be taken more than once but only for 6 hours of ITM 455/555 or ITMD 455/555.
Prerequisite(s): [(ITM 311)]
(2-2-3)

ITMD 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)

ITMD 461**Internet Technologies & Web Design**

This course will cover the creation of Web pages and sites using HTML, CSS, Javascript 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)

ITMD 462**Web Site Application Development**

Programming the Common Gateway Interface (CGI) for Web pages is introduced with emphasis on creation of interfaces to handle HTML 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 Web site including basic CGI programs with Web interfaces and process data flows from online forms with basic database structures.

Prerequisite(s): [(ITM 461) OR (ITMD 461)]
(2-2-3) (C)

ITMD 463**Intermediate Web 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

Prerequisite(s): [(ITM 411 and ITM 461) OR (ITMD 411 and ITMD 461)]
(2-2-3)

ITMD 464**Advanced Web Application Development**

Strategies for management of electronic commerce allow students to learn to re-engineer established business processes to increase enterprise competitive advantage, provide better customer service, reduce operating costs, and achieve a better return on investment. Students will learn to evaluate, use, and deploy state-of-the-art tools and techniques needed to develop a reliable e-commerce offering on the Web. The course will cover state-of-the-art programming and development tools. This class will provide students with hands-on exposure needed to design and build a fully functional e-commerce Web site.

Prerequisite(s): [(ITM 463) OR (ITMD 463)]
(2-2-3)

ITMD 465**Rich Internet Applications**

Students learn to create interactive rich internet applications using web development frameworks, applications, and techniques that primarily operate on the client-side. These applications often exhibit the same characteristics as desktop applications and are typically delivered through a standards-based web browser via a browser plug-in or independently via sandboxes or virtual machines. Current software frameworks used to download, update, verify, and execute these applications are addressed as well as writing applications for deployment in these frameworks.

Prerequisite(s): [(ITM 461) OR (ITMD 461)]
(2-2-3)

ITMD 466**Service-Oriented Architecture**

This course covers IT enterprise systems employing web services technologies in SOA and ESB architectural patterns. The student considers SOA which defines and provisions IT infrastructure and allows for a loosely-coupled data exchange over disparate applications participating in business processes. The simplification of integration and flexible reuse of business components within SOA is greatly furthered by ESB. Lab exercises using contemporary tool-kits are utilized to reinforce platform-agnostic course topics.

Prerequisite(s): [(ITM 411 and ITM 461) OR (ITMD 411 and ITMD 461)]
(2-2-3)

ITMD 469

Topics in Application Development

This course will cover a particular topic in application development, varying from semester to semester, in which there is particular student or staff interest. This course may be taken more than once but only 9 hours of ITM 469/569 or ITMD 469/569 credit may be applied to a degree. (Credit: Variable)

Information Technology and Management: Management

ITMM 470

Fundamentals of Management for Technology Professionals

This course explores fundamentals of management for professionals in high-technology fields. It addresses the challenges of the following: managing technical professionals and technology assets; human resource management; budgeting and managerial accounting; management of services, infrastructure, outsourcing, and vendor relationships; technology governance and strategy; and resource planning. (3-0-3)

ITMM 471

Project Management for Information Technology & Management

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)

ITMM 481

IT Entrepreneurship

This course prepares students to become leaders in information technology and to build ITM companies. Students design and develop a prototype ITM product and prepare a business plan and venture proposal presentation. (3-0-3)

ITMM 482

Business Innovation

This course is designed to teach innovative thinking through theory, methods, and practice of innovation. The course incorporates Einstein's thinking, and Edison's method to establish the innovation process that can be applied in current business environment. Current economic conditions and global sourcing requires that innovation becomes a leading tool for developing a competitive edge. Innovation has been considered a competency of educated, design engineering, and a selected few employees that has become insufficient today. Corporations and organizations need innovation to develop customer-specific solutions in almost real time. (3-0-3)

ITMM 485

Legal & Ethical Issues in Information Technology

Current legal issues in information technology are addressed including elements of contracting, payment systems and digital signatures, privacy concerns, intellectual property, business torts, and criminal liability including hacking, computer trespass and fraud. Examination of ethical issues including privacy, system abuse, and ethical practices in information technology equip students to make sound ethical choices and resolve legal and moral issues that arise in information technology. (3-0-3)

Information Technology and Management: Operations

ITMO 440

Introduction to Data Networking & 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, 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)

ITMO 441

Network Administration & 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 Windows networking are addressed. A research paper in the above topic areas is required.

Prerequisite(s): [(ITM 440) OR (ITM 540 with min. grade of C) OR (ITMO 440) OR (ITMO 540 with min. grade of C)] (2-2-3)

ITMO 444

Cloud Computing Technologies

Computing applications hosted on dynamically-scaled virtual resources available as services are considered. Collaborative and non-collaborative "cloud-resident" applications are analyzed with respect to cost, device/location independence, scalability, reliability, security, and sustainability. Commercial and local cloud architectures are examined. A group-based integration of course topics will result in a project employing various cloud computing technologies.

Prerequisite(s): [(ITM 411 and ITM 456) OR (ITMD 411 and ITMO 456)] (2-2-3)

ITMO 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. A group project or research paper will demonstrate mastery of the subject.

Prerequisite(s): [(ITM 301)] (4-4-6)

ITMO 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. A group project or research paper will demonstrate mastery of the subject.

Prerequisite(s): [(ITM 302)]
(4-4-6)

ITMO 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 first-hand experience of this technology.

Prerequisite(s): [(ITM 301) OR (ITM 302)]
(2-2-3)

ITMO 456**Introduction to Open Source Operating Systems**

Students learn to set up and configure an industry-standard, open-source operating system including system installation and basic system administration. Also addressed are applications and graphical user interfaces as well as support issues for open-source software.

(2-2-3)

Information Technology and Management: Security

ITMS 428**Database Security**

Students will engage in an in-depth examination of topics in data security including security considerations in applications and systems development, encryption methods, cryptography law and security architecture and models.

Prerequisite(s): [(ITM 421) OR (ITMD 421)]
(3-0-3)

ITMS 443**Vulnerability Analysis & Control**

This course addresses hands-on ethical hacking, penetration testing, and 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 the use of open source and freeware tools; students will learn in a closed environment to probe, penetrate, and hack other networks. It is recommended, but not required, that students also take ITMS 448 prior to or in parallel with this course.

(2-2-3)

ITMS 448**Cyber Security Technologies**

Prepares students for a role as a network security analyst and administrator. Topics include viruses, worms, and other attack mechanisms, vulnerabilities, and countermeasures; network security protocols, encryption, identity and authentication, scanning, firewalls, security tools, and organizations addressing security. A component of this course is a self-contained team project that, if the student wishes, can be extended into a fully operational security system in a subsequent course.

Prerequisite(s): [(ITM 440) OR (ITM 540 with min. grade of C) OR (ITMO 440) OR (ITMO 540 with min. grade of C)]
(2-2-3) (C)

ITMS 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(s): [(ITM 456) OR (ITMO 456)]
(2-2-3)

ITMS 478**Cyber 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 & models using current standards and models

(3-0-3) (C)

ITMS 479**Topics in Information Security**

This course will cover a particular topic in Information Security, varying from semester to semester, in which there is particular student or staff interest. This course may be taken more than once but only 9 hours of ITM 479/579 or ITMS 479/579 credit may be applied to a degree.

(Credit: Variable)

Information Technology and Management: Theory and Technology

ITMT 491**Undergraduate Research**

Undergraduate research. Written consent of instructor is required.

(Credit: Variable)

ITMT 492**Embedded Systems & Reconfigurable Logic Design**

This course covers reconfigurable intelligent devices programmed with modern high level languages focusing on design and integration to modern environments. The course will also cover the topic and deployment of wireless sensor networks and the use of rapid prototyping for commercial application. Students will discover hardware, software and firmware design trade-offs as well as best practices in current embedded systems development. A final project will integrate course topics into a system using an embeddable single-board microcontroller.

Prerequisite(s): [(ITM 311) OR (ITM 312)]
(3-0-3)

Course Descriptions

ITMT 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.

(Credit: Variable)

GRADUATE COURSES

Degree-seeking undergraduates may take graduate courses with approval of the course instructor and faculty advisor. For course descriptions, see the *IIT Bulletin: Graduate Programs*.

ITMD 511

Application Development Methodologies

ITMD 521

Client/Server Technologies & Applications

ITMD 526

Data Warehousing

ITMD 527

Data Analytics

ITMD 529

Advanced Data Analytics

ITMD 532

UML-Based Software Development

ITMD 535

Data Center Architecture

ITMM 572

Process Engineering for Information Technology Managers

ITMM 573

Building & Leading Effective Teams

ITMM 574

Information Technology Management Frameworks

ITMM 575

Networking & Telecommunications Management

ITMM 576

Data Center Management

ITMM 577

Case Studies in Management of Information Technology

ITMM 582

Business Innovation

ITMM 584

Information Technology at C-Level

ITMM 586

Information Technology Auditing

ITMO 542

Wireless Technologies & Applications

ITMO 545

Telecommunications Technology

ITMO 546

Telecommunications Over Data Networks

ITMO 547

Telecommunications Over Data Networks: Projects & Advanced Methods

ITMO 556

Intelligent Device Projects

ITMO 557

Storage Technologies

ITMS 518

Coding Security

ITMS 538

Cyber Forensics

ITMS 539

Steganography

ITMS 549

Cyber Security Technologies: Projects & Advanced Methods

ITMS 555

Mobile Device Forensics

ITMS 588

Incident Response, Disaster Recovery, and Business Continuity

ITMT 514

Enterprise Application Architecture

ITMT 531

Object-Oriented System Analysis, Modeling & Design

ITMT 533

Operating System Design Implementation

ITMT 537

Instructional Technologies

ITMT 593

Embedded Systems