Information Technology and Management - School of Applied Technology

Department Web site: appliedtech.iit.edu/information-technology-and-management

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Dean and Chair
C. Robert Carlson

Associate Chair and Director of Undergraduate Advising
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 produces graduates who are able to:

- Problem solve and create innovative answers to provide technology solutions for the problems of business, industry, government, non-profit organizations, and individuals.
- Identify and analyze user needs, identify and define computing requirements appropriate to the problem solution, and take them into account in the selection, creation, evaluation, and administration of computer- and network-based systems.
- Apply current technical and mathematical concepts and practices in the core information technologies and recognize the need to engage in continuing professional development.

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

Bachelor of Information Technology and Management students are required to complete a minor. The minor may be in a field which will compliment 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 at least 58 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, J. Papademas, R. Trygstad

Industry Associate Professor
J. Hajek

Adjunct Assistant Professor
O. Aldawud, B. Lublinsky

Adjunct Industry Professors
B. Goins, P. Gupta, D. Hood, N. Joiner, M. Schray, W. Slater, K. Vaccaro

Adjunct Industry Associate Professors
M. England, P. Huang, J. Kulp, J. Lambert, S. McBride, J. Meyers, J. Owrey, S. Shamsuddin, R. VanDame

Adjunct Instructors
B. Bailey, S. Davis, S. Hughes-Durkin, L. McHugh, L. Papademas, S. Spyrison

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 127 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 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, biology, or engineering graphics. 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 Sciences

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; Discrete Math and Probability & Statistics are highly recommended. Students who enter the program with less than fifty-eight hours of total transfer credit or less than five hours of mathematics credit will be required to take a mathematics elective; BUS 221 Analytics for Informed Decision-Making is preferred.

Free or Technical Electives

Twenty-eight 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 69 semester hours at IIT and transfer 58 semester hours to complete the Bachelor's degree for a total of 127 semester hours. This includes 18 information technology courses for a total of 54 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 or behavioral science electives and two IPRO courses. Two social or behavioral science electives must be from the same field and one must be from a different field; lower level social or behavioral science electives count towards this requirement. The computer science general education requirement may be satisfied by completion of ITM 311.

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.

Bachelor of Information Technology and Management students are required to complete a minor. ITM students are strongly encouraged to consider minors which complement their primary program of study; these include (but are not limited to) Business, Industrial Technology, 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. The minor requirement may be waived for students entering as transfer students or who change their major to Information Technology and Management after completion of 30 hours of studies at IIT.

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

Required Courses	Credit Hours
ITM Requirements ITM 100, 301, 311, 312, ITMD 411, 421, 434, 461, ITMM 471, ITMO 440, 456, ITMS 448, ITMT 430	38
ITM Electives Select from ITM, ITMD, ITMM, ITMO, ITMS, ITMT, and TECH	18
Mathematics Requirements A mathematics elective at the level of MATH 119 or above (MATH 230 is strongly recommended), and a Statistics Elective (BUS 221, PSYC 203 or MATH 425)	6
Natural Science and Engineering Requirements (EG 225 is recommended)	11
Humanities and **Social or Behavioral Science Requirements** (PSYC 301 is recommended)	21
Interprofessional Projects	6
Minor Electives	15
Free Electives	12
Total Hours	**127**

Information Technology & Management Curriculum

Semester 1		Credits
ITM 301	Intro to Contemp Op Sys / Hardware	3
ITMD 421	Data Modeling and Applications	3
Humanities 100-level Elective		3
Natural Science or Engineering Elective		4
Total Hours		**13***

Semester 2		Credits
ITM 100	Introduction to the Profession	2
ITM 311	Introduction to Software Development	3
Mathematics elective (MATH 230 is recommended)		3
Social or Behavioral Science Elective		3
Natural Science or Engineering Elective		4
Total Hours		**15**

Semester 3		Credits
ITM 312	Introduction to Systems Software Prog	3
ITMM 471	Project Management for Info Technology	3
ITMO 440	Intro to Data Networks and the Internet	3
Natural Science or Engineering Elective		3
Social or Behavioral Science Elective		3
Total Hours		**15**

Semester 4		Credits
ITMD 411	Intermediate Software Development	3
ITMD 434	Human/Computer Interaction	3
ITMD 461	Internet Technologies & Web Design	3
ITM Elective		3
Statistics Elective (BUS 221, MATH 425, PSYC 203)		3
Minor Elective		3
Total Hours		**18**

Semester 5		Credits
ITMD 456	Intro to Open Source Operating Systems	3
ITM Elective		3
Social or Behavioral Science Elective		3
Minor Elective		3
Humanities Elective (300+)		3
Free Elective		3
Total Hours		**18**

Semester 6		Credits
ITM Elective		3
ITM Elective		3
IPRO Elective I		3
Social or Behavioral Science Elective (300+)		3
Minor Elective		3
Free Elective		3
Total Hours		**18**

Semester 7		Credits
ITMS 448	Cyber Security Technologies	3
ITM Elective		3
Minor Elective		3
Humanities Elective (300+)		3
Free Elective		3
Total Hours		**15**

Semester 8		Credits
ITMT 430	System Integration	3
ITM Elective		3
IPRO 497	Interprofessional Project II	3
Minor Elective		3
Humanities or Social or Behavioral Science Elective		3
Total Hours		**15**

Total Credit Hours **127**

* Students should be aware that students not completing 30 hours of study in their first year will still be classified as a first year student in the first semester of their second year of study, which may adversely impact some financial aid. Students with issues or questions about this should discuss it with a Financial Aid Counselor.

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

Required Courses	Credit Hours
Courses Transferred (or taken at IIT)	58
Humanities 300/400 level courses required	6
Social or Behavioral Science (PSYC 301 is recommended)	3
Interprofessional Projects	6
ITM Requirements ITM 301, 311, 312, ITMD 411, 421, 434, 461, ITMM 471, ITMO 440, 456, ITMS 448, ITMT 430	36
ITM Electives Select from ITM, ITMD, ITMM, ITMO, ITMS, ITMT, and TECH	18
Total Hours	**127**

Information Technology and Management Curriculum

(students entering as transfer, part time)

Semester 1		Credits
ITM 301	Intro to Contemporary Op Systems / Hardware	3
ITM 311	Introduction to Software Development	3
ITMD 421	Data Modeling and Applications	3
Total Hours		**9**

Semester 2		Credits
ITM 312	Introduction to Systems Software Programming	3
ITMO 440	Introduction to Data Networks and the Internet	3
Humanities Elective (300+)		3
Total Hours		**9**

Semester 3		Credits
ITMD 461	Internet Technologies and Web Design	3
ITMD 411	Intermediate Software Development	3
ITMM 471	Project Management for Info Technology	3
Total Hours		**9**

Semester 4		Credits
ITMO 456	Intro to Open Source Operating Systems	3
ITMD 434	Human/Computer Interaction	3
Humanities Elective (300+)		3
Total Hours		**9**

Semester 5		Credits
ITMS 448	Cyber Security Technologies	3
ITM Elective		3
Social or Behavioral Science Elective		3
Total Hours		**9**

Semester 6		Credits
ITMT 430	System Integration	3
IPRO Elective I		3
ITM Elective		3
Total Hours		**9**

Semester 7		Credits
IPRO 497	Interprofessional Project II	3
ITM Elective		3
ITM Elective		3
Total Hours		**9**

Semester 8		Credits
ITM Elective		3
ITM Elective		3
Total Hours		**6**

Total Credit Hours **69**

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 adviser, 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 433 Enterprise Server Administration

ITMO 441 Network Applications and Operations

ITMO 450 Enterprise End-User System Administration

ITMO 453 Open Source Server Administration

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 Web sites and applications for Internet deployment.

ITMO 441 Network Applications and Operations

ITMD 462 Web 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 467 Web Systems Integration

ITMD 469 Topics in Application Development

IT Entrepreneurship and Management

Focuses on 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 electives at the 200-level or above*

OR *any INTM electives selected with adviser's approval.*

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 management of servers.

ITMO 441 Network Applications and Operations

AND *select two courses from the following:*

ITMO 433 Enterprise Server Administration

ITMO 450 Enterprise End-User System Administration

ITMO 453 Open Source Server Administration

AND *select two courses from the following:*

ITMO 417 Shell Scripting for System Administrators

ITMO 444 Cloud Computing Technologies

ITMO 454 Operating System Virtualization

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 433 Enterprise Server Administration

ITMO 453 Open Source Server Administration

AND *select any two courses from ITMO, ITMT, or the following:*

ITMD 465 Rich Internet Applications

ITMS 443 Vulnerability Analysis and Control

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 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

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.
(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, hardware components, software compatibility and system installation topics are covered, along with post-installation, storage, security, and system diagnosis/repair. Topics also include discussion of current and future technology industry trends.
(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-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(s): [(ITM 311)]
(2-2-3)

ITMD 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(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): [(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): [(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. Prerequisite(s): consent of instructor. This course may be taken more than once but only 9 hours of ITMD 419/519 credit may be applied to a degree.
(Credit: Variable)

ITMD 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)

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): [(ITMD 421)]
(3-0-3)

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 9 hours of ITMD 455 credit may be applied to a degree.
Prerequisite(s): [(ITM 311)]
(Credit: Variable)

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 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(s): [(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): [(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): [(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): [(ITMD 461)]
(2-2-3)

ITMD 466
Service-Oriented Architectures
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 toolkits are utilized to reinforce platform-agnostic course topics.
Prerequisite(s): [(ITMD 411 and ITMD 461)]
(2-2-3)

ITMD 467
Web Systems Integration
In this project-based course, student teams will build an enterprise-grade website and web infrastructure integrating server-side applications, databases, and client-side Rich Internet applications as a solution to a defined business problem.
Prerequisite(s): [(ITMD 462 and ITMD 465]
(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 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. Includes Software Development concepts of requirements analysis, object modeling and design and software testing. Management of application development and major Web development projects will also be addressed.
(3-0-3)

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 485
Legal and 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 433
Enterprise Server Administration

Students learn to set up and maintain and administer X86-based servers and associated networks using a contemporary industry-standard proprietary operating system. Topics include hardware requirements; software compatibility; system installation, configuration and options and post-installation topics; administrative and technical practices required for system security; process management; performance monitoring and tuning; storage management; back-up and restoration of data; and disaster recovery and prevention. Also addressed is configuration and administration of common network and server services such as DNS, DHCP, remote access, email, basic virtualization, web and web services, and more.
Prerequisite(s): [(ITM 301) and (ITMO 440)]
(2-2-3)

ITMO 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, 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 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 Windows networking are addressed. A research paper in the above topic areas is required.
Prerequisite(s): [(ITMO 440) OR (ITMO 540)]
(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): [(ITMD 411 and ITMO 456)]
(2-2-3)

ITMO 450
Enterprise End-User System Administration

Students learn to set up, configure, and maintain end-user desktop and portable computers and devices in an enterprise environment using a contemporary proprietary operating system, including the actual installation of the operating system in a networked client-server environment. User account management, security, printing, disk configuration, and backup procedures are addressed, with particular attention to coverage of networked applications. System installation, configuration and administration issues as well as network file systems, network access and compatibility with other operating systems are also addressed. Administration of central server resources associated with management and provisioning of end-user systems in workgroups, domains or forests is also addressed.
Prerequisite(s): [(ITM 301)]
(2-2-3)

ITMO 453
Open Source Server Administration

Students learn to set up, configure, and administer an industry-standard open source server operating system, including integration with client systems using a variety of operating systems in a mixed environment. Topics include hardware requirements; software compatibility; administrative and technical practices required for system security; process management; performance monitoring and tuning; storage management; back-up and restoration of data; and disaster recovery and prevention. Also addressed are configuration and administration of common network and server services such as DNS, DHCP, firewall, proxy, remote access, file and printer sharing, email, web and web services, and more. as well as support issues for open source software.
Prerequisite(s): [(ITMO 456) and (ITMO 440)]
(2-2-3)

ITMO 454
Operating System Virtualization
This course will cover technologies allowing multiple instances off 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(s): [(ITM 301) OR (ITMO 456)]
(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; system architecture; package management; command–line commands; devices, filesystems, and the filesystem hierarchy standard. Also addressed are applications, shells, scripting and data management; user interfaces and desktops; administrative tasks; essential system services; networking fundamentals; and security, as well as support issues for open source software. Multiple distributions are covered with emphasis on the two leading major distribution forks.
(2-2-3)

Information Technology and Management: Security

ITMS 428/528
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(s): ITMD 421
(3-0-3)

ITMS 443
Vulnerability Analysis and 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 use of open source and freeware tools; students will learn in a closed environment to probe, penetrate and hack other networks. Prerequisite(s):
(2-2-3)

ITMS 448
Cyber Security Technologies
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 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 follow-on course.
Prerequisite(s): [(ITMO 440) and (ITMO 456)]
(2-2-3)

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): [(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 & methodology, business continuity & 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)

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. Prerequisite(s): consent of instructor. This course may be taken more than once but only 9 hours of ITMS 479/579 credit may be applied to a degree.
(Credit: variable)

Information Technology and Management: Theory & Technology

ITMT 430
System Integration
This capstone course will allow students, through completion of a major project in the integration of information systems, to demonstrate mastery of the fundamentals of system integration and architecture. They will demonstrate their ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems as well as their ability to effectively integrate IT-based solutions into the user environment. The course will also ensure students understand professional, ethical, legal, security and social issues and responsibilities; have the ability to analyze the local and global impact of computing on individuals, organizations, and society; and recognize the need for and have the ability to engage in continuing professional development.
Prerequisite(s): [(ITMD 411) and (ITMD 421) and (ITMD 434) and (ITMM 471) and (ITMO 440) and (ITMO 456)]
(2-2-3)

ITMT 491
Undergraduate Research
Undergraduate Research.
(Credit: variable)

ITMT 492
Embedded Systems and Reconfigurable Logic Design
This course covers reconfigurable intelligent devices programmed with modern high level languages focusing on design and integration to modern environments. This course also covers 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 (312)]
(3-0-3)

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)

Technology

TECH 497
Special Projects in Technology
Independent study and project.
(Credit: variable)

Information Technology and Management: Graduate Courses

The following graduate courses are available to degree-seeking undergraduate students with approval of the course instructor and faculty adviser, and to co-terminal degree students; additional graduate courses may be available to co-terminal degree students. See the current ***IIT Bulletin: Graduate Programs*** for full descriptions

ITMD 511
Application Development Methodologies

ITMD 512
Structured and Systems Programming

ITMD 521
Client Server Technologies and Applications

ITMD 523
Advanced Topics in Data Management

ITMD 526
Data Warehousing

ITMD 527
Data Analytics

ITMD 529
Advanced Data Analytics

ITMD 532
UML Based Software Development

ITMD 535
Data Center Architecture

ITMD 556
Intelligent Device Projects

ITMM 572
Process Engineering for Information Technology Managers

ITMM 573
Building and Leading Effective Teams

ITMM 574
Information Technology Management Frameworks

ITMM 575
Networking and Telecommunications Management

ITMM 576
Data Center Management

ITMM 577
Case Studies in the Management of Information Technology

ITMM 582
Business Innovation

ITMM 584
Information Technology at C-Level

ITMM 586
Information Technology Auditing

ITMO 542
Wireless Technologies and Applications

ITMO 545
Telecommunications Technology

ITMO 546
Telecommunications Over Data Networks

ITMO 547
Telecommunications Over Data Networks: Projects & Advanced Methods

ITMO 557
Storage Technologies

ITMS 518
Coding Security

ITMS 538
Cyber Forensics

ITMS 539
Steganography

ITMS 549
Cyber Security Technologies: Projects and Advanced Methods

ITMS 555
Mobile Device Forensics

ITMS 588
Incident Response, Disaster Recovery and Business Continuity

ITMT 514
Enterprise Application Architectures

ITMT 531
Object Oriented System Analysis, Modeling and Design

ITMT 533
Operating System Design Implementation

ITMT 535
Data Center Architecture

ITMT 537
Instructional Technologies

ITMT 593
Embedded Systems

TECH 580
Topics in the Management of Technology

TECH 581
Consulting for Technical Professionals

TECH 597
Special Problems in Technology