

Information Technology & Management

Information Technology & Management

Center for Professional Development
Daniel F. and Ada L. Rice Campus
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The Master of Information Technology & Management is designed primarily for working professionals who seek a hands-on, laboratory based program that broadens and deepens their knowledge of new and emerging information technologies, the application and integration of these technologies, and the administrative practices used in the effective management of these technologies.

Degree Offered

Master of Information Technology & Management

Certificate Program

Computer and Network Security Technologies

Faculty

C. Robert Carlson, Professor, Director of the Center for Professional Development and Academic Director, Information Technology and Management Degree Programs. B.A. Augustana College, Ph.D. University of Iowa. Database design, object-oriented modeling and design, software engineering, and IT entrepreneurship.

Carol Davids, Alva C. Todd Professor and Director of the VoIP Laboratory, Center for Professional Development. B.S.E.E. Cornell, M.I.T.M. Illinois Institute of Technology. Voice over IP, networks, and digital and voice communications.

Dennis Hood, Lecturer. B.S. Rensselaer Polytechnic Institute, M.S. Stevens Institute of Technology. Project Management, process engineering, information technology management.

William Lidinsky, Alva C. Todd Professor and Assistant Director, Information Technology and Management Degree Programs. B.S.E.E., M.S.E.E. Illinois Institute of Technology, M.B.A. University of Chicago. Computer networking, computer and network security, and computer and network forensics.

Alexander K. Manov, Senior Lecturer. Ph.D. Illinois Institute of Technology. Database systems, operating systems, database and system security.

Raymond E. Trygstad, Lecturer and Director of Information Technology, Center for Professional Development. B.S. United States Naval Academy, M.S.S.M. University of Denver. Online design, Internet application development, multimedia, system administration, information security management, and information technology policy.

Laboratory and Research Facilities

The Center for Professional Development operates and administers over 250 computers and servers in two locations to support teaching and learning. Eleven laboratories include two Sun Solaris facilities, one networking/network security facility, and one dedicated Voice over IP (VoIP) facility which includes an entire CISCO VoIP LAN as well as video and mesh wireless capabilities. The network security and VoIP laboratories provide additional facilities for student projects and applied research, some of which is undertaken in conjunction with industry partners. Additionally one IITV/IIT Online

classroom is wired for full network connectivity for notebook computers, which are made available for students who cannot provide their own. All laboratories are normally available for student use outside of class hours, and one or more laboratories are available for student use weekdays between 10 am and 10 pm at the Rice Campus. A wireless network at the Rice Campus provides complete coverage of the campus and operates at all times that the campus is open. Students make extensive use of the network infrastructure provided to support personal notebook computers.

Admission Requirements

Applicants for admission must have earned a four-year bachelor's degree from an accredited institution with a minimum cumulative undergraduate GPA of 3.0/4.0. International applicants are required to submit a GRE score with a minimum score of 1200 (combined score for tests taken prior to Oct. 1, 2002); or 900 quantitative + verbal and 2.5 analytical writing, (for tests taken on or after Oct. 1, 2002) and may be required to submit a TOEFL score (see page 26). Admission as a non-degree student follows the university policy set forth in this bulletin.

Students whose undergraduate degree is not in a computer-related area or who do not have significant experience or certifications in the information technology

field will be required to demonstrate proficiency in the undergraduate courses that are prerequisites for the graduate program. Proficiency may be demonstrated by taking and passing a written exam or taking and passing, with a grade of "B" or better, the prerequisite undergraduate courses at IIT. Current prerequisites for the Master of Information Technology & Management include computer hardware and operating system literacy (ITM 301 or ITM 302 or equivalent coursework, certification or experience) and an ability to program at a basic level using a contemporary programming language (ITM 311 or ITM 312 or equivalent coursework, certification or experience).

Master of Information Technology & Management

30 credit hours (Courses may be selected from 400-and 500-level courses; a minimum of 18 credit hours must be at the 500-level or higher.)
GPA of 3.0/4.0 or better

Students whose undergraduate degree is not in a computer-related area or who do not have significant experience or certifications in the information technology field will be required to complete core courses or demonstrate their knowledge through equivalent coursework, certification or experience. These core courses will ensure basic knowledge of networking concepts, protocols and methods (ITM 540); knowledge of the Internet, including the ability to build Web sites and deliver them on

a server (ITM 461); and the ability to create and administer databases using a modern database management system (ITM 421).

The following course groupings are meant to guide students in their course selection, allowing them to focus on a particular area of information technology, depending on their interests, background and career goals; alternative courses in each concentration may be available at the discretion of the student's advisor. Students are not required to choose a specialization for degree completion and can mix courses from different specializations; a general program of study is also available.

Core Courses (9 hours)

Required courses

ITM 421	Data Modeling and Applications
ITM 561	Internet Technologies & Web Design
ITM 540	Introduction to Data Networks and the Internet

Note: Core courses may be waived upon presentation of evidence of equivalent coursework, certification or experience.

Computer and Information Security (18 hours)

Recommended courses (9 hours)

ITM 528	Database Security
ITM 548	System and Network Security
ITM 578	Information Systems Security Management

Plus three courses chosen from the following:

ITM 538	Computer & Network Forensics
ITM 549	System and Network Security: Projects & Advanced Methods
ITM 551	Distributed Workstation System Administration
OR	
ITM 552	Client-Server System Administration
ITM 558	Operating System Security

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Healthcare Information Technology (18.6 hours)

HM courses are offered through the Stuart School of Business and are scheduled on a quarter rather than a semester basis; HM course start dates may be different than other courses and each course runs for 10 weeks.

Recommended courses (9.6 hours)

HM 500	Management of Healthcare
HM 510	Healthcare Systems and Technology
HM 520	Health Informatics
HM 530	Organization, Policy and Strategic Health Systems

Plus three courses chosen from the following

ITM 495	Bioinformatics
ITM 521	Client Server Technologies and Applications
ITM 531	Object Oriented System Analysis, Modeling and Design
ITM 571	Project Management for Information Technology Management
ITM 574	Strategic Information Technology Management
ITM 578	Information Systems Security Management

IT Management and Entrepreneurship (18 hours)

Recommended courses (9 hours)

ITM 571	Project Management for Information Technology Management
ITM 574	Strategic Information Technology Management
ITM 581	IT Entrepreneurship

Plus three courses chosen from the following:

ITM 531	Object Oriented System Analysis, Modeling and Design
ITM 532	UML Based Software Development
ITM 572	Process Engineering for Information Technology Managers
ITM 573	Building & Leading Effective Teams
ITM 575	Networking and Telecommunications Management
ITM 578	Information Systems Security Management
ITM 585	Legal and Ethical Issues in Information Technology

Voice and Data Communication Technology (18 hours)

Recommended courses (9 hours)

ITM 540	Introduction to Data Networks and the Internet
ITM 545	Telecommunications Technology
ITM 546	Voice Communications Over Data Networks

Plus three courses chosen from the following:

ITM 541	Network Administration and Operations
ITM 542	Wireless Technologies and Applications
ITM 548	System and Network Security
ITM 549	System and Network Security: Projects & Advanced Methods
ITM 571	Project Management for Information Technology Management
ITM 575	Networking and Telecommunications Management
ITM 594	Special Project in Digital Voice and Data Communication

Data Management (18 hours)

Recommended courses (9 hours)

ITM 421	Data Modeling and Applications
ITM 422	Advanced Database Management

Plus three courses chosen from the following:

ITM 521	Client Server Technologies and Applications
ITM 528	Database Security
ITM 531	Object Oriented System Analysis, Modeling and Design
ITM 534	Human Computer Interaction
ITM 574	Strategic Information Technology Management
ITM 578	Information Systems Security Management
ITM 594	Special Project in Data Management

Information Technology & Management

Internet Development and Electronic Commerce (18 hours)

Recommended courses (9 hours)

ITM 461	Internet Technologies & Web Design
ITM 562	Web Application Development
ITM 571	Project Management for Information Technology Management

Plus three courses chosen from the following:

ITM 411	Intermediate Object Oriented Programming
ITM 414	Visual Programming Environments
ITM 415	Advanced Object Oriented Programming
ITM 541	Network Administration and Operations
ITM 563	Internet Application Development
ITM 564	Electronic Commerce Applications and Management
ITM 565	Dynamic Web Page Development
ITM 566	Web Services & Service-Oriented Architectures
ITM 567	Enterprise Web Application Development
COM 525	Research and Usability Testing

Software Development (18 hours)

Recommended courses (9 hours)

ITM 521	Client Server Technologies and Applications
ITM 532	UML Based Software Development
ITM 571	Project Management for Information Technology Management

Plus three courses chosen from the following:

ITM 411	Intermediate Object Oriented Programming
ITM 412	Advanced Structured and Object Oriented Programming
ITM 415	Advanced Object Oriented Programming
ITM 511	Application Development Methodologies
ITM 531	Object Oriented System Analysis, Modeling and Design
ITM 536	Software Testing and Maintenance
ITM 567	Enterprise Web Application Development
ITM 572	Process Engineering for Information Technology Managers

Systems Administration (18 hours)

Recommended courses (9 hours)

ITM 541	Network Administration and Operations
ITM 551	Distributed Workstation System Administration
OR	
ITM 552	Client-Server System Administration

Plus three courses chosen from the following:

ITM 456	Introduction to Open Source Operating Systems
ITM 558	Operating System Security
ITM 571	Project Management for Information Technology Management
ITM 574	Strategic Information Technology Management
ITM 575	Networking and Telecommunications Management

Information Technology & Management

Master of Information Technology & Management: General Course of Study

These are selected groupings of courses allowing students enrolled in the Master of Information Technology & Management degree to develop a broad overview knowledge of information technology. Suggested courses in each area are marked with an asterisk (*) with one alternative course listed for each area; more alternatives may be possible at the discretion of the student's advisor.

Internet Development and Electronic Commerce

- *ITM 461 Internet Technologies & Web Design
- *ITM 562 Web Site Application Development
- ITM 574 Strategic Information Technology Management

Data Management

- *ITM 421 Data Modeling and Applications
- *ITM 521 Client Server Technologies and Applications
- ITM 531 Object Oriented System Analysis, Modeling and Design

Networking and Communications

- *ITM 540 Introduction to Data Networks and the Internet
- *ITM 548 System and Network Security
- ITM 541 Network Administration and Operations

System Administration

- *ITM 551 Distributed Workstation System Administration
- OR**
- *ITM 552 Client-Server System Administration

Software Development

- *ITM 411 Intermediate Object Oriented Programming
- *ITM 532 UML Based Software Development
- ITM 571 Project Management for Information Technology Management

Computer & Information Security

- *ITM 578 Information Systems Security Management
- ITM 528 Database Security
- ITM 548 System and Network Security

Certificate Programs

Certificate programs offer working professionals an opportunity to increase their knowledge and skills in the specific areas of information technology. A certificate representing proven academic performance is presented after the required coursework is completed with a GPA of 3.0/4.0.

Courses taken may be later applied toward a degree program. Applicants should have a bachelor's degree from an accredited college or university; the degree need not be in an information technology or computer related field.

Computer and Network Security Technologies

This program is designed for students seeking knowledge that will prepare them for careers in computer and network security and to deal with the challenging computer and network security problems facing society. All courses may be later applied toward the Master of Information Technology and Management degree for those who apply and are accepted to the degree program.

Students in this program must select nine hours of coursework from the following:

- ITM 540 Introduction to Data Networks and the Internet
- OR**
- ITM 421 Data Modeling and Applications

and any two of the following six courses

- ITM 528 Database Security
- ITM 538 Computer & Network Forensics
- ITM 548 System and Network Security
- ITM 549 System and Network Security: Projects & Advanced Methods
- ITM 558 Operating System Security
- ITM 578 Information System Security Management

Students who have already completed coursework or certification equivalent to ITM 540 and/or ITM 421 may substitute a third course from the above list.

Accelerated Courses

The program may offer accelerated courses for credit in several areas of information technology & management. (Students should see the definition of accelerated courses on page 41.)

Accelerated courses provide an opportunity for degree-seeking students at IIT to complete graduate degree requirements in a shorter time period. If taken by non-degree seeking students, all courses may be later applied toward the Master of Information Technology and Management degree for those who apply and are accepted to the degree program.

Course Descriptions

Numbers in parentheses indicate class, lab and credit hours, respectively.

ITM 511

Application Development Methodologies

Students learn concepts in a systematic approach to the analysis, design, implementation and maintenance of software. Includes studies of the various models of the software life-cycle, software development project management, system requirements analysis, and methodologies for practical application of these models to software development, including the use of CASE (Computer Aided Software Engineering) tools. Students apply these principles in projects to improve the quality of their development process and final products. Prerequisite: ITM 412 or significant software development experience. (2-2-3)

ITM 521

Client/Server Technologies and Applications

This course covers both concepts and practical applications of client server systems, a common form of distributed system in which software is split between server tasks and client tasks. Both central and distributed server models will be studied, with particular focus on middleware, systems planning, and data access. The course includes hands-on development of client-server applications in database systems. Prerequisite: ITM 421. (2-2-3)

ITM 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: ITM 421. (3-0-3)

ITM 531

Object-Oriented System Analysis, Modeling and Design

This course will cover object-oriented approaches to system analysis, data modeling and design that combine both process and data views of systems. Emphasis is given to practical problems and the techniques needed to create solutions in systems design. (3-0-3)

ITM 532

UML-Based Software Development

Study of software development using the Unified Modeling Language (UML). Covers architecture-driven and component based techniques for modeling object-oriented applications. Particular emphasis is placed on the hands-on application of tools and components used for object-oriented systems modeling. Prerequisite: ITM 412 or significant object-oriented programming experience. (3-0-3)

ITM 534

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)

ITM 535

Systems Architectures

The course deals with building integrated information infrastructures, including both hardware, software and network components, as a solution to particular information management needs and requirements. Students should be able to recognize major architectural styles in existing systems, understand how architecture influences long-term

system evolution, describe and document an architecture effectively, and design suitable architectural solutions for a problem. Software integration and security issues are addressed. Prerequisite: ITM 531. (3-0-3)

ITM 536

Software Testing and Maintenance

This course covers the basic concepts of software testing and maintenance. The Testing Maturity Model provides a framework for developing a more mature test process. Testing techniques, test metrics and test plan management concepts are described within this framework. Prerequisites: ITM 471 or ITM 571. (3-0-3)

ITM 538

Computer & Network Forensics

This course will address methods to properly conduct a computer and/or network forensics investigation including digital evidence collection and evaluation and legal issues involved in network forensics. Technical issues in acquiring court-admissible chains-of-evidence using various forensic tools that reconstruct criminally liable actions at the physical and logical levels are also addressed. Prerequisite: ITM 548 (2-2-3)

ITM 540

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, organizations, 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)

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ITM 541

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 2000 workgroups and domains: file and printer sharing, remote access, and the Windows Network Neighborhood are addressed. A research paper in the above topic areas is required. Prerequisite: ITM 440 or ITM 540 (2-2-3)

ITM 542

Wireless Technologies and Applications

This course will present the foundation of wireless technologies and examine state-of-the-art wireless systems and services, including digital cellular systems (DCS), wireless asynchronous transfer mode (ATM), infrared data transfer (IrDA), wireless local area network technologies including 802.11b (wireless Ethernet) and Bluetooth, and third-generation (3G) systems such as wireless code division multiple access (W-CDMA) and cdma2000. Security for wireless systems including encryption and authentication issues will also be addressed. Prerequisite: ITM 441 or ITM 541. (3-0-3)

ITM 545

Telecommunications Technology

Introduction to voice and data communications infrastructure design and implementation. Current infrastructure including components of voice networks (such as carrier switches, PBXs, SS7, T1 trunks, and switched versus dedicated circuits), the Public Switched Telephone Network (PSTN), communications industry structure, telephone-data system interfaces and interaction, and convergence of voice and data communications systems will be examined, along with possible alternative approaches. Also examined will be components of data networks

such as modems, multiplexers, virtual circuits, hubs, bridges, and routers and their relationships to voice communications technology will be highlighted. (3-0-3)

ITM 546

Telecommunications Over Data Networks

This course covers a suite of application protocols known as Voice over IP (VoIP). It describes important protocols within that suite including RTP, SDP, MGCP, and SIP and the architecture of various VoIP installations including on-net to on-net, on-net to PSTN and Inter-domain scenarios. The functions of the Network Elements that play significant roles in this architecture will be defined. Examples of network elements that are currently available as products will be examined. Prerequisite: ITM 440 or ITM 540 (3-0-3)

ITM 548

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 component of this course is a self-contained team project that, if the student wishes, can be extended into a full operational security system in a follow-on course (ITM 549). Prerequisite: ITM 440 or ITM 540 (2-2-3).

ITM 549

System and Network Security: Projects and Advanced Methods

Prepares students for a role as a network security analyst and developer and give the student experience in developing a production security system. Topics may include computer and network forensics, advances in cryptography and security protocols and systems; operating system security, analysis of recent security attacks, vulnerability and intrusion detection, incident analysis, and the

design and development of secure networks. This course includes a significant real world team project that results in a fully operational security system. Students should have previous experience with object-oriented and/or scripting languages. Prerequisite: ITM 548 (2-2-3) (C)

ITM 551

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: ITM 301 (4-4-6)

ITM 552

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: ITM 302 (4-4-6)

ITM 555

Handheld Device Technologies

An in-depth introduction to contemporary handheld device technologies such as personal digital assistants

(PDA), handheld computers, network analysis/security devices and wireless telephone/pager technologies including I-mode and wireless access protocol (WAP). Fundamentals of programming and security considerations for handheld device technology are introduced. Prerequisites: ITM 412, ITM 421, and ITM 461 or 561, or a working knowledge of object-oriented programming, database fundamentals, and HTML (2-2-3)

ITM 558
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 562
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)

ITM 563
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. Prerequisite: ITM 411 (2-2-3)

ITM 564
Electronic Commerce Applications and Management

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: ITM 563. (2-2-3)

ITM 565
Dynamic Web Page Development

Students will learn the W3C and major vendor's 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 web pages will also be covered in detail. Prerequisite: ITM 461 (2-2-3)

ITM 566
XML and XHTML

The student is introduced to extensible markup languages and associate modeling technique required to develop leading edge Web documentation for a next generation Web site, and learns to design structured and intuitive markup utilizing schema and stylesheets which flexibly augment the underlying extensible

markup language infrastructures. Principles of XML use are reinforced by analysis of business case studies including an XML-based Web site. Prerequisite: ITM 461 (2-2-3)

ITM 567
Enterprise Web Application Development

Students learn how to construct large-scale enterprise-level Web applications using current technologies. Areas covered include components, design goals, and architecture as well as integration of databases and directory services; security will be discussed and give rise to topics including persistence, communication, transactions and container services. Students will design, develop and deploy a real-world Web application. Prerequisite: ITM 415 or permission of Instructor (2-2-3)

ITM 571
Networking and Telecommunications Management

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)

ITM 572
Process Engineering for Information Technology Managers

This course will provide students with the knowledge and skills to define, model, measure and improve business processes. The course will focus on reengineering processes through the application of technology to achieve significant and measurable improvement. The course will explore the latest industry standards and students will use state-of-the-art software tools for hands-on experiential learning. Prerequisite: ITM 471 or ITM 571 (3-0-3)

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ITM 573

Building and Leading Effective Teams

This course will prepare students to be effective IT managers. Students will be introduced to the general challenges of management as well as the challenges unique to leading teams of technology professionals. The course will explore the skills necessary to excel as a leader including dealing with conflict, developing leadership skills, recruiting and developing employees, and leading remote and virtual teams. Students will explore case studies and execute team exercises to enrich their learning experience. Prerequisite: ITM 471 or ITM 571 (3-0-3)

ITM 574

Strategic Information Technology Management

This course defines information technology management strategies, explores the possible information technology strategies of an organization, and provides conceptual frameworks for the development and evaluation of information technology management strategies. It also examines concepts of strategic information technology systems, approaches for analyzing strategic applications, and systems planning as it relates to information technology management strategy and the interface with organizational strategies. (3-0-3)

ITM 575

Networking and Telecommunications Management

This course addresses the design, implementation, and management of computer networks and enterprise telecommunication systems. Design issues in wide area networks and telecommunications with emphasis on Internet connectivity are also addressed. Tools for supporting the distribution and sharing of system resources and information are discussed, along with tools to support network design and management. Prerequisite: ITM 541 (3-0-3)

ITM 578

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)

ITM 581

IT Entrepreneurship

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

ITM 585

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)

ITM 593

Embedded Systems

This course introduces embedded systems concepts and technology, illustrates the trade-offs which occur as part of embedded systems design, as well as providing practical applications of embedded systems technology. Particular emphasis is given to embedded systems hardware, software and development tools. The course labs include hands-on development of several stand-alone embedded applications

using development tools such as compilers, simulators and evaluation boards. Prerequisite: ITM 301 or equivalent computer architecture course; C/C++ programming experience. (2-2-3)

ITM 594

Special Projects in Information Technology

Capstone project. Prerequisite: Written consent of instructor. (Credit: 1 to 6)

ITM 595

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)

ITM 597

Special Problems in Information Technology

Independent study and project. Prerequisite: Consent of instructor. (Credit: variable)

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Undergraduate Courses Available to Graduate Students in Information Technology & Management

ITM 301 (as a prerequisite only)
**Introduction to Contemporary
Operating Systems and Hardware I**

ITM 302 (as a prerequisite only)
**Introduction to Contemporary
Operating Systems II**

ITM 311 (as a prerequisite only)
**Introduction to Object Oriented
Programming**

ITM 312 (as a prerequisite only)
**Introduction to Systems Software
Programming**

ITM 411
**Advanced Object-Oriented
Programming**

ITM 412
**Advanced Structured
and Systems Programming**

ITM 414
Visual Programming Environments

ITM 415
**Advanced Object Oriented
Programming**

ITM 421
Data Modeling and Applications

ITM 422
Advanced Database Management

ITM 423
Advanced Database Management II

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

ITM 460
Fundamentals of Multimedia

ITM 461
**Internet Technologies & Web
Design**

ITM 492
**Embedded Systems and
Reconfigurable Logic Design**

ITM 495
Topics in Information Technology