APPLIED INFORMATION TECHNOLOGY (AIT)

Courses

AIT 500 FUNDAMENTALS OF COMPUTER PROGRAMMING AND DATA STRUCTURES (6)

Structured problem solving, algorithm development, fundamentals of computer programming, basic data structures and their implementation, sort and search algorithms, and an introduction to the design and development of information systems. Serves as a preparatory/foundational course for MS in AIT and does not count towards the degree. Prerequisite: Admission to AIT program.

AIT 600 INFORMATION TECHNOLOGY INFRASTRUCTURE (3)

A discussion of information systems architectures including software systems, hardware, operating systems, data bases, object-oriented technology, networking and enterprise-wide systems. Prerequisite: Admission to AIT program.

AIT 610 SYSTEMS DEVELOPMENT PROCESS (3)

Structured and object-oriented analysis, design and implementation of information systems; distributed information systems; information systems life cycle models, platforms and security. Discussions of requirements definition, modeling quality assurance and development environments. Prerequisites: AIT 600 (may be taken concurrently). Not open to students who have successfully completed AIT 624.

AIT 612 INFORMATION SYSTEMS VULNERABILITY AND RISK ANALYSIS (3)

The identification of vulnerabilities and risks inherent in the operation of information systems will be explored. Countermeasures will be discussed and documented in an effort to counter identified vulnerabilities. Prerequisite: AIT 610 or AIT 624 (may be taken concurrently with AIT 610).

AIT 613 INTRODUCTION TO SOFTWARE SECURITY (3)

A study of security concepts in software. This course discusses design principles for secure software development, and some of the security issues in current applications, database systems, and web systems. It provides the foundation for identifying vulnerabilities, their impact, and solutions to securing them. Prerequisite: AIT 610 or AIT 624 (may be taken concurrently).

AIT 614 NETWORK SECURITY (3)

Network security, hacker attacks, Web security, e-mail security, e-commerce security, systems and operation environment security, database security, algorithms for making data communications secure, encryption and coding techniques and IP security. Prerequisite: AIT 612.

AIT 616 FUNDAMENTALS OF WEB TECHNOLOGIES AND DEVELOPMENT (3)

Introduction to HTTP protocol, dynamic HTML and common gateway interface (CGI) programming. Study and practice of object-oriented programming concept using Java. Design and implementation of application software including graphical user interfaces (GUIs), concurrent and distributed programming, distributed information systems server architectures, database connectivity and the enterprise packages provided by the Java programming language. Prerequisite: AIT 610 or AIT 624 (may be taken concurrently).

AIT 618 CLIENT/SERVER-SIDE PROGRAMMING ON THE WEB (3)

Discussion of HTTP protocol, dynamic HTML, common gateway interface (CGI) programming, Java applets and server-side programming. Development of information systems incorporating applications executing on a client-server system. Design and implementation of distributed information systems involving the technologies developed for the Web. Prerequisite: AIT 616.

AIT 620 BUSINESS DATA COMMUNICATIONS (3)

Business data communications, distributed data processing, fundamental data transmission, network types, distributed applications, client/server architecture, network management and security, and Internet /intranet, extranet. Prerequisite: AIT 610 or AIT 624 (may be taken concurrently).

AIT 622 NETWORKS ARCHITECTURE AND PROTOCOLS (3)

Review of fundamentals of network technology, Internet protocols, multicasting, subnet and supernet addressing, routing algorithms, client-server, socket interface, bootstrap and auto configuration, file transfer, e-mail, and Internet security. Prerequisite: AIT 620.

AIT 624 SOFTWARE ENGINEERING FUNDAMENTALS (3)

Application of formal software engineering principles and practices to the development of information systems, application software and embedded, computer-based systems. A comprehensive description of the software engineering process will be presented along with a discussion of the approaches, methodologies and tools available to the practicing software engineer. Prerequisite: AIT 600 (may be taken concurrently). Not open to students who have completed AIT 610.

AIT 628 INFORMATION TECHNOLOGY AND BUSINESS STRATEGY (3)

Design and evolution of technology strategy; the development of the firm's innovative capabilities and implementing a development strategy; changes in business strategies due to the emergence of the Internet and e-business; new business models that have emerged, the components of such models, the dynamics and appraisal of the models, and the new value configurations. Prerequisite: AIT 610 or AIT 624 (may be taken concurrently).

AIT 630 INFORMATION TECHNOLOGY PROJECT MANAGEMENT (3)

Tools and techniques for the successful management of information technology projects. Topics include project selection and approval, planning, estimation techniques, scheduling methods, budgeting, IT project organizations, and project control and assessment. Prerequisite: AIT 628.

AIT 632 DATABASE MANAGEMENT SYSTEMS (3)

Study of database management system fundamentals, data models, design, implementation and processing. Most popular database management systems such as Oracle, SQL Server, and Access are used throughout the course to illustrate design and implementation of real-world database applications and processing. Prerequisite: AIT 610 or AIT 624 (may be taken concurrently).

AIT 641 SOFTWARE REQUIREMENTS ENGINEERING (3)

Introduces the basic concepts and principles of software requirements engineering. Designed to expose student to common tools and techniques, established methods for modeling software systems and various approaches to requirements engineering (structured, object oriented, and formal). In essence, the course intends to cover in its entirety the process of requirements engineering. Prerequisite: AIT 624/ COSC 612.

AIT 642 SOFTWARE TESTING AND MAINTENANCE (3)

A comprehensive survey of software maintenance and testing, principles, methodologies, management strategies, techniques and tools. Software testing at the unit, subsystem levels using various test design techniques, as well as integration, regression, and system testing methods, and software testing tools. Designing and implementing software technologies to increase maintainability and testability, evaluating software for change and validating software changes. Prerequisite: AIT 624/ COSC 612.

AIT 643 ENTERPRISE ARCHITECTURE (3)

Provides a set of latest approaches in designing IT infrastructures aligning them with enterprise business activities at the architectural level, including business architecture, information architecture, solution architecture, and technology architecture. Institutionalization of enterprise architecture frameworks and standards will be discussed. Topics include the fundamentals of business functions and IT infrastructure of an enterprise including definitions frameworks, business process modeling process institutionalization using CMMI, EA implementation through service-oriented architecture (SOA), and the various networking technologies in LAN/MAN/WAN as the enablers for EA. Prerequisite: AIT 624/COSC 612.

AIT 644 HEALTH INFORMATION TECHNOLOGY (3)

Provides students in-depth understanding of the important health care information technology (HIT) topics such as inter-operable electronic health records, health information exchanges, data standards, public health informatics, disease classification coding, and emerging trends in health information technology. Students will also learn to apply modeling techniques, HIT methodologies for building intuitive and user-friendly health information systems. Prerequisite: AIT 610 or AIT 624 (may be taken concurrently).

AIT 645 HEALTHCARE DATA ANALYTICS (3)

Overview of the data analysis methods used in health care. The course emphasizes experiential and applied learning. Using an open source statistical computing language, students will gain an understanding of the statistical analysis methods used in health care. Data visualization is also covered as well as database searching and mining of health care data. No background in statistics is required for this course. Prerequisite: AIT 610 or AIT 624 (may be taken concurrently).

AIT 650 COMPUTER & NETWORK FORENSICS AND INCIDENT RESPONSE (3)

Traditional computer forensic analysis and network forensics are rapidly converging disciplines. Depending on one's objectives, incident response can be an active, real-time forensic analysis. At the very least, the process of incident response will have a significant impact on any later forensic analysis. Prerequisite: AIT 610 or AIT 624 (may be taken concurrently).

AIT 652 ETHICS, LAW AND POLICY IN CYBERSPACE (3)

This is a course for technical managers and is designed to create an awareness of the ethical issues, legal resources and recourses, and policy implications inherent in our evolving on-line society. The course provides an overview of the ethical challenges faced by individuals and organizations in the information age and introduces the complex and dynamic state of the law as it applies to behavior in cyberspace. It is intended to sensitize managers and professionals to the pitfalls and dangers of doing business in an interconnected world, and to familiarize the student with various organizations and materials that can be turned to for assistance in understanding how to ethically and legally operate and use modern computer systems and networks.

AIT 655 MANAGING INFORMATION SECURITY (3)

This is an advanced study course in information assurance. The focus is on applying the various specific information assurance concepts, understandings, methods, processes and tools for the previous IA, Telecommunication and IT courses taken by the student to formulate the basis for sound business decisions. Prerequisite: AIT 614.

AIT 660 MOBILE DEVICE FORENSICS (3)

Presents a digital forensic analysis methodology applied to modern mobile devices such as cell phones, smartphones, GPS devices, tablet computers, and many other "embedded devices." Prerequisite: AIT 650.

AIT 665 CLOUD COMPUTING (3)

Focuses on cloud computing and its role in the IT field. The course is designed to introduce the fundamental elements, frameworks and standards related to cloud computing. Instruction will be a combination of lecture, group/individual projects and assignments aimed at the dissemination of conceptual elements with practical application. This course has been offered as a special topic; students who have earned credit for this course as a special topic will not receive additional credit for AIT 665. Prerequisites: AIT 610 or AIT 624.

AIT 670 SPECIAL TOPICS IN APPLIED INFORMATION TECHNOLOGY (3)

Selected topics in applied information technology. Emphasis on new and emerging applications in information technology. Prerequisites: 6 units of graduate work in AIT and consent of instructor.

AIT 695 INDEPENDENT STUDY IN APPLIED INFORMATION TECHNOLOGY (3)

Independent supervised study in selected areas of information technology and its application in a variety of fields. Prerequisites: 6 units of graduate work in AIT and consent of AIT graduate program director.

AIT 697 GRADUATE INTERNSHIP (3)

Gives AIT students the opportunity to be involved in a computing facility at an industrial setting. Each student will be assigned to a specific facility associated with a local business or industry and will be supervised by the appropriate supervisor of the computing facility and by the faculty member in charge of the course. May be repeated for a maximum of 6 units. Graded S/U.

AIT 710 CASE STUDIES IN INFORMATION SECURITY (3)

Consists of a real-world project dealing with information security in distributed information systems including applications of theory and techniques in information security. This is a capstone course for the Information Security and Assurance certificate. Prerequisites: AIT 612, AIT 614 and consent of AIT graduate program director.

AIT 715 CASE STUDIES IN INTERNET APPLICATIONS (3)

Real-world project dealing with the development of information systems for Internet applications; emphasis on distributed information systems for Web deployment. This is a capstone course for the Internet Application Development certificate. Prerequisites: AIT 616, AIT 618 and consent of AIT graduate program director.

AIT 720 CASE STUDIES IN NETWORKING TECHNOLOGY (3)

Real-world projects dealing with the development, installation, and management of application systems or a variety of networks environment; emphasis is on distributed applications for LAN, WAN, Internet and intranet. This is a capstone course for the Networking Technologies certificate. Prerequisites: AIT 620, AIT 622 and consent of AIT graduate program director.

AIT 725 CASE STUDIES IN SOFTWARE ENGINEERING (3)

Real-world project dealing with design and development of large-scale information systems including applications of theory and techniques in software engineering. This is a capstone course for the Software Engineering certificate. Prerequisites: AIT 624 and one of the following courses: AIT 641 or AIT 642 or AIT 643; and consent of AIT graduate program director.

AIT 730 CASE STUDIES IN INFORMATION SYSTEMS (3)

Real-world projects dealing with issues related to development, management and maintenance of large-scaled information systems; emphasis is on business information systems for a distributed environment. This is a capstone course for the Information Systems Management certificate. Prerequisites: AIT 628, AIT 630 and consent of AIT graduate program director.

AIT 732 ADVANCED DATABASE MANAGEMENT SYSTEMS (3)

Emphasizes advanced topics in database management systems. Topics include: query pro transaction processing, concurrency and recovery techniques, advanced database models, object-oriented databases, relational databases and Web databases, distributed databases, data warehousing and OLAP. Prerequisite: AIT 632.

AIT 735 CASE STUDIES IN DATABASE MANAGEMENT SYSTEMS (3)

Real-world projects dealing with issues related to development, management and maintenance of large-scaled information systems; emphasis is on the distributed database systems and related security issues. This is a capstone course for the Database Management Systems certificate. Prerequisites: AIT 632, AIT 732 and consent of AIT graduate program director.

AIT 740 CASE STUDIES ON HEALTHCARE INFORMATION TECHNOLOGIES (3)

Real world projects that provide an integrative project experience with an interdisciplinary team of peers, and internal or external local partners. Provides opportunity for students to carry out a team-based project activity on a specified topic in the Health Information Technology (IT) domain. The final project should make an original contribution to the body of knowledge in the profession or otherwise demonstrate core competencies in Health IT. Prerequisites: 12 credits completed in Health Information Technology Management PBC and approval of Graduate Director.

AIT 745 CASE STUDIES IN COMPUTER FORENSICS (3)

Real-world project dealing with forensic investigation of computational devices including applications of theory and techniques in the area of computer forensics. This is a capstone course for the Computer Forensics certificate. Prerequisites: AIT 650 and AIT 660 and consent of AIT graduate program director.

AIT 790 RESEARCH METHODOLOGY, IT TECHNICAL WRITING AND PRESENTATION (3)

The aim of this course is to teach students fundamental research skills and methods necessary to perform and disseminate quality research. Quantitative and qualitative research methods, data analysis approaches and/or algorithmic proofs will be introduced. The format of the course will consist of lectures, group discussions, and student presentations. Students will research an area of interest, including an in-depth literature search of appropriate conference proceedings and journals. After instructor approval of the selected papers (based on their cohesiveness, integrity, and significance to the topic), students will write a research project proposal that includes an introduction to the problem, a section on the literature search performed, and discussion of the research methodology used. Students will be required to give a final presentation. Prerequisite: D.Sc. in IT Admission Status.

AIT 880 GRADUATE PROJECT (3-6)

Students conduct a study in an advanced IT related topic or undertake the analysis, design and implementation of real-world application. The application may be related to an industrial project sponsored by a company or it may be a mutual interest to the student and the supervising faculty. May be repeated for a maximum of 6 units. Prerequisites: program admission and approval of program director.

AIT 885 PROJECT CONTINUUM (1)

Continuation of graduate project. Prerequisite: previous registration for project work.

AIT 890 PRE-DISSERTATION RESEARCH ROTATION (3-6)

Research conducted in an advanced IT related area under the supervision of a graduate faculty member. The topic may be linked to potential dissertation research and of mutual interest to the doctoral student and the supervising faculty. Registration by consent as authorized by doctoral program director or chair of the department. Prerequisites: DSc in IT student status, research proposal by the student and advisor, DSc in IT program director's approval.

AIT 895 DOCTORAL INDEPENDENT STUDY (3-6)

Independent guided study for doctoral students to prepare for qualifying exams in preparation for dissertation work. May be repeated up to a total of 9 units. Registration by special permit as authorized by doctoral program director or chair of the department. S/U grading. Prerequisite: DSc in IT student status.

AIT 997 DISSERTATION (3-6)

Independent guided research leading to the dissertation. May be repeated up to a total of 24 units. Registration by special permit as authorized by doctoral program director or chair of the department. Graded S/U. Prerequisites: requires a grade of B (3.0) or higher in AIT 790 and program admission.

AIT 999 DISSERTATION CONTINUUM (1)

Continuing work toward the completion of the dissertation. Registration by special permit as authorized by doctoral program director or chair of the department. Prerequisite: DSc in IT student status.