Information Technology - CPS (ITC)

ITC 1000. Computer Applications. (3 Hours)
Offers a beginning course in computer productivity tools for those with little or no prior experience. Introduces basic elements of organizing computer files and folders and of creating word processing documents, spreadsheets, and presentations. Requires a Windows environment.

ITC 1200. Operating Systems Concepts. (3 Hours)
Introduces students to the basic structure and organization of computer operating systems. Examines the functional characteristics of major computer components and their relationship to control by software. Topics include general computer organization and configuration. Compares characteristics of different operating systems such as Windows and UNIX.

ITC 1990. Elective. (1-4 Hours)
Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

ITC 2000. Principles of Systems Analysis and Design. (3 Hours)
Introduces the methodologies, models, tools, and techniques used in modern system development. Topics covered include project life-cycle models, project management techniques, requirements elicitation, use-case analysis, business rules, system design approaches, and graphic modeling with the Unified Modeling Language (UML). Offers students an opportunity to analyze and document a business case; complete a system analysis; and design, model, and prepare a project plan.

Attribute(s): NUpath Natural/Designed World

ITC 2016. End-User Data Analysis Tools. (3 Hours)
Focuses on technical skills used for acquiring and analyzing data with advanced spreadsheet tools and with end-user database software. Students use advanced word processing techniques to present the results of data analysis. Expects students to already have basic skills in word processing and spreadsheet applications. Course uses Windows-based applications.

Attribute(s): NUpath Analyzing/Using Data

ITC 2050. Designing the User Experience. (3 Hours)
Studies user experience (UX) design theory and practice, focusing on its interdisciplinary nature. Describes the principles of UX and the practice of user interface design. Discusses the major human information processing subsystems (perception, memory, attention, and problem solving), and introduces usability metrics and evaluation methods.

ITC 2100. Introduction to Programming (Java). (3 Hours)
Offers a hands-on first programming course for those with no prior programming experience. Covers basic programming logic and syntax. Uses object-oriented programming concepts, including arrays, methods, classes, and instantiation. Offers students an opportunity to code stand-alone computer applications with graphical user interfaces (GUI) using modern interactive development tools.

Prerequisite(s): MTH 2100 with a minimum grade of D- or MTH 2105 with a minimum grade of D- or MTH 2110 with a minimum grade of D- or MTH 2400 with a minimum grade of D-

ITC 2200. Networking Foundations. (3 Hours)
Introduces principles of computer networks, network architectures, network topologies, network protocols, and layering concepts. Addresses both theoretical aspects, such as performance modeling and analysis, and practical considerations of implementing Internet protocols.

Prerequisite(s): ITC 1200 with a minimum grade of D- ; ITC 2000 with a minimum grade of D-

ITC 2300. Database Management Systems. (3 Hours)
Introduces Structured Query Language (SQL). Topics include designing normalized data tables for use in a relational database management system, creating entity-relationship models, database transaction processing, and security.

Prerequisite(s): ITC 2000 with a minimum grade of D-

ITC 2400. Web and Mobile Development. (3 Hours)
Studies modern markup languages and standards (HTML5 and CSS) for cross-platform webpages and applications. Through lectures, discussions, and hands-on projects, offers students an opportunity to learn common best practices in graphical interface design and usability for different target audiences. They then have an opportunity to apply these design skills by refining creative designs into websites through an iterative process of creating hand-drawn storyboards, then coding wireframes, adding basic web content, and finally making pages responsive so that they are suitable for a variety of mobile devices. Webpage artifacts include tables, images, links, and simple apps.

Attribute(s): NUpath Creative Express/Innov

ITC 2430. E-Commerce Systems. (3 Hours)
Introduces the theory and practice of doing business on the Internet. Begins with the infrastructure that makes e-commerce possible, including Internet protocols, Internet applications, and Internet languages. Examines e-commerce software, e-commerce security issues, and e-commerce payment systems. Topics in business strategies for e-commerce include purchasing, electronic data interchange, supply chain management, virtual communities, and Web portals. Offers students an opportunity to understand how tools and strategies may be applied to e-business models, including business-to-business (B2B) and business-to-consumer (B2C). Examines international, legal, and ethical issues as they relate to e-commerce.

Prerequisite(s): MGT 1100 with a minimum grade of D-

ITC 2990. Elective. (1-4 Hours)
Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

ITC 3100. Advanced Applications Development (Android). (3 Hours)
Focuses on developing complex end-user applications (for Android) that address a business problem or opportunity. Topics include utilizing database interfaces and managing user sessions.

Prerequisite(s): ITC 2100 with a minimum grade of D- or GET 2100 with a minimum grade of D- or CET 2200 with a minimum grade of D-

ITC 3150. Database Websites. (3 Hours)
Offers students an opportunity to integrate relational databases into webpages. Covers how to query, update, and manage databases. Emphasizes using basic programming techniques (loops, conditionals, built-in functions) to interact with existing relational databases. All software used in the course is open source and runs on a variety of platforms.

Prerequisite(s): ITC 2300 with a minimum grade of D- ; ITC 2400 with a minimum grade of D-

ITC 3220. Mobile and Wireless Networking. (3 Hours)
Covers technologies used for wireless and mobile business applications. Topics include wireless network protocols, cellular phone carriers, wireless platform operating systems, and wireless security issues.

Prerequisite(s): ITC 2200 with a minimum grade of D-

ITC 3250. UNIX Systems Administration. (3 Hours)
Covers the essential skills needed to manage the day-by-day operations of a UNIX computer system. Topics include techniques for adding new users and groups and management of the file system, focusing on access controls. Covers backup plans and techniques as well as job scheduling and basic networking in the UNIX environment. Offers students an opportunity to build shell scripting skills.

Prerequisite(s): ITC 1200 with a minimum grade of D-

ITC 3300. Structured Query Language (SQL). (3 Hours)
Covers concepts and techniques for manipulating relational databases. Offers students an opportunity to learn to code native SQL for creating and accessing data tables, indexing, arithmetic operations, loops, arrays, multiple table processing, I/P operations, data-type conversions, and views.

Prerequisite(s): ITC 2300 with a minimum grade of D-

ITC 3310. Exploring NoSQL Databases. (3 Hours)
Explores the capabilities and applications of NoSQL technology in today's fast-paced digital world. Covers essential topics such as database architecture, security, and data distribution techniques in a NoSQL context. Offers students an opportunity to obtain hands-on practice with the most common nonrelational databases used in contemporary applications development.

Prerequisite(s): ITC 2300 with a minimum grade of D-

ITC 3320. Data Warehousing Technologies. (3 Hours)
Offers students an opportunity to learn how organizations construct and maintain data warehouses built from operational databases. Topics include a comparison of data warehouse architectures, how to build a data warehouse, and how to structure databases for efficient data analysis.

Prerequisite(s): ITC 2300 with a minimum grade of D-
Attribute(s): NUpath Analyzing/Using Data

ITC 3400. Web Design and Multimedia. (3 Hours)
Covers the history of multimedia technology, focusing on the uses of multimedia in website development. Examines the technical and design aspects of basic components of multimedia: text, audio, graphics, video, sound, animation, and virtual reality. Emphasizes the use of multimedia in user interfaces. This is a hands-on course in which students practice techniques throughout the course.

Prerequisite(s): ITC 2400 with a minimum grade of D-
Attribute(s): NUpath Creative Express/Innov

ITC 3500. IT Project Management. (3 Hours)
Covers the tools and techniques used to manage information technology (IT) projects. Topics include project planning, scheduling, and budgeting and project management tools (PERT/CPM/Gantt). Discusses all phases of IT projects from proposal evaluation through postimplementation reviews. Offers students an opportunity to plan and develop a project that provides a practical application of the topics covered in class.

Prerequisite(s): ITC 2100 with a minimum grade of D- ; ITC 2200 with a minimum grade of D- ; ITC 2300 with a minimum grade of D- ; ITC 2400 with a minimum grade of D-
Attribute(s): NUpath Writing Intensive

ITC 3620. Legal and Ethical Issues in Cybersecurity. (3 Hours)
Describes the legal and ethical issues associated with information security. Emphasizes national and international laws relating to information assurance and data use and emerging technologies for management of digital rights. Examines criminal activities such as computer fraud and abuse, desktop forgery, embezzlement, child pornography, computer trespass, and computer piracy.

Attribute(s): NUpath Ethical Reasoning

ITC 3990. Elective. (1-4 Hours)
Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

ITC 4200. Network Security. (3 Hours)
Explores the theory and practice of computer security, focusing on the security aspects of multiuser systems and the Internet. Topics include cryptography concepts, firewalls; viruses; two-tier authentication; Trojan horses; password security; biometrics; VPNs; Internet protocols such as SSL, IPsec, PGP, SNMP, SSH; and others.

Prerequisite(s): ITC 2200 with a minimum grade of D-

ITC 4600. Information Security Management. (3 Hours)
Covers management issues occurring within the field of information security. Topics include asset classification and control (protecting the most valuable information of the organization); personnel security (employee awareness); security as a part of everyday communications and operations; business continuity management; and compliance (legal, internal/external, audit, and other concerns).

Prerequisite(s): ITC 2200 with a minimum grade of D- ; ITC 2300 with a minimum grade of D-

ITC 4610. Penetration Testing. (3 Hours)
Examines processes used in penetration testing and ethical hacking. Focuses on identifying, assessing, remediating, and managing cybersecurity risks and vulnerabilities effectively. Key topics include an overview of the current cybersecurity landscape; information gathering techniques; identification of vulnerabilities across network, host, and application attack vectors; and exploitation methods used by penetration testers and attackers. Analyzes the legal and regulatory frameworks governing penetration testing, including the ethics and professional standards that govern the legitimate actions of penetration testers. Blends theoretical knowledge and practical application to offer students an opportunity to obtain essential skills needed to strengthen the security posture of computer networks in various organizational contexts.

Prerequisite(s): ITC 2200 with a minimum grade of D-

ITC 4640. Foundations of Cloud Computing. (3 Hours)
Introduces the concepts and foundation principles of cloud services as they relate to commercial cloud service provider offerings such as AWS (Amazon Web Services). Covers compute, storage, networking, and security, as well as a variety of tools to carry out infrastructure tasks. Offers content beneficial to system administrators, developers, project managers, or those seeking a basic understanding of cloud computing. Includes hands-on exercises in the cloud. Specific programming skills are not required for this course.

Prerequisite(s): ITC 1200 with a minimum grade of D-

ITC 4660. Encryption Concepts. (3 Hours)
Surveys the principles and the practices of encryption and cryptography and the core encryption algorithms used in digital communication. Discusses core information assurance building blocks—such as authentication, digital signatures, key management, and digital certificates—and applies these concepts to important security architectures, including the IP networks and the cellular system.

ITC 4670. Software Vulnerabilities. (3 Hours)
Seeks to help students to become aware of systems software security issues and to gain a basic understanding of software security measures. Discusses software in use today, their related vulnerabilities, and how they are exploited. Examines protection and detection techniques and the secure software development life cycle.

ITC 4680. Forensics in Information Technology. (3 Hours)
Explores the techniques used in computer forensic examinations. Examines computer hardware, physical and logical disk structure, and computer forensic techniques. Builds awareness of the tools and techniques to investigate, seize, and analyze computer-based evidence.

ITC 4690. Software Engineering and Security. (3 Hours)
Focuses on secure software engineering. Offers students an opportunity to practice the development of software that adheres to secure design principles and uses modern software engineering best practices throughout the Secure Systems Development Lifecycle.

Prerequisite(s): ALY 2100 with a minimum grade of D- or CET 2200 with a minimum grade of D- or ITC 2100 with a minimum grade of D- or ITC 3100 with a minimum grade of D- or ITC 3150 with a minimum grade of D-

ITC 4850. Information Technology Project. (3 Hours)
Offers students an opportunity to utilize skills from across the discipline to create a final IT project in a team environment. This is the capstone course for the program, designed as the culminating experience that engages students in the execution of a real-world project.

Prerequisite(s): ITC 3500 with a minimum grade of D-
Attribute(s): NUpath Capstone Experience, NUpath Writing Intensive

ITC 4955. Project. (1-4 Hours)
Provides students with an opportunity to demonstrate the skills they have learned throughout the program by developing an end-to-end proposal and plan for an IT application and the infrastructure it relies on. The project requires a justification, a budget, an architecture document, a presentation, and a project plan. May be repeated without limit.

ITC 4973. Topics in Emerging Information Technologies. (3 Hours)
Focuses on new and emerging technologies as they relate to information technology and software development. Specific topics vary based on developments in the field and include a discussion of the ethical effects of these developments.

Prerequisite(s): ITC 2100 with a minimum grade of D-

ITC 4983. Topics. (1-4 Hours)
Covers special topics in information technology. May be repeated without limit.

ITC 4990. Elective. (1-4 Hours)
Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

ITC 5000. Database Management Systems. (2.25 Hours)
Covers the use and capabilities of modern database management systems with an emphasis on performance and reliability. After a brief review of conceptual data models and database design, the focus moves to the underlying technology—database engines, storage and indexing, memory use, the relational model, normalization/de-normalization, query processing, and SQL. Also discusses the need for and design of concurrency control, integrity, security, and recovery capabilities.

ITC 5010. Information Technology Strategy and Governance. (2.25 Hours)
Focuses on the strategic use of information technology (IT) from a business perspective at the enterprise level. Covers business fundamentals and a strategic framework for aligning organizational strategy, core competencies, and information systems. Covers strategic IT management, including IT policy and governance, accountability frameworks, financial analysis, risk management, and legal compliance issues.

ITC 5020. Information Systems Design and Development. (2.25 Hours)
Discusses the planning, analysis, design, and implementation of computer-based information systems, focusing on the methodologies and procedures used in organizational problem solving and systems development. Topics include the systems development life cycle; project management; requirements analysis and specification; feasibility and cost-benefit analysis; logical and physical design; prototyping; system validation, deployment, and postimplementation review. Additional topics may include platform and database selection and integration issues, CASE tools, end-user training, maintenance, and object-oriented analysis and design.

ITC 5035. Information Technology Project Management. (2.25 Hours)
Covers the tools and techniques used to manage information technology projects. Topics include project planning, scheduling, and budgeting; project management tools (i.e., PERT/CPM/GANTT); and human resources management. Discusses all phases of IT projects from proposal writing through postrelease maintenance issues. Offers students an opportunity to plan and develop a project that provides a practical application of the topics covered in class.

ITC 5300. Foundations of Information Security. (2.25 Hours)
Offers an overview of the threats to the security of information systems, the responsibilities and basic tools for information security, and the levels of training and expertise needed in organizations to reach and maintain a state of acceptable security. Topics include an introduction to confidentiality, integrity and availability, authentication, encryption and access controls, intrusion detection and response, social engineering, physical security, policy formation and enforcement, legal and social issues, and risk management.

ITC 5305. IT Infrastructure (Systems, Networks, Telecom). (2.25 Hours)
Introduces the elements of IT infrastructure—systems, networks, and telecommunications. Telecommunication fundamentals include data, voice, image, and video. Covers the concepts, models, architectures, protocols, standards, and security for the design, implementation, and management of digital networks. Discusses the essentials of local area networks (LANs), metropolitan area networks (MANs), and wide area networks (WANs).

ITC 5315. Information Security Risk Management. (2.25 Hours)
Focuses on applying risk management to information security. Covers the security risk management life cycle including risk profiling, threat modeling, risk assessment, risk mitigation, and risk monitoring. Explores security controls, risk analysis techniques, vulnerability management, security governance, and industry standards and frameworks. Offers students an opportunity to practice risk assessments, propose mitigation plans, and present their risk management approaches.

ITC 5345. Systems and Network Administration. (2.25 Hours)
Focuses on the skills, tools, and best practices required to provide and support computing infrastructure and services. Aims to prepare the student to be responsible, from an ethical and legal perspective, for the infrastructure and computing system administration in an organization. Offers students an opportunity to obtain advanced technology enterprise infrastructure skills to support data centers and administer websites, as well as to resolve incidents, conduct troubleshooting, practice system backup and disaster recovery skills, and address system security issues.

ITC 5355. Web Application Design and Development. (2.25 Hours)
Introduces the development of Web applications. Topics covered include Web servers, Web application servers, Web application development methods, client-side and server-side scripting, and Web application development techniques. Offers students an opportunity to learn to construct and maintain a well-designed Web site and use state-of-the-art Web application development tools and languages to develop Web applications. Other topics include Web application security, session management, design patterns, and reusable Web application components.

ITC 5400. Foundations of Informatics. (2.25 Hours)
Introduces the fundamental properties of information, technologies, and people within an increasingly complex infrastructure and social system. Offers students an opportunity to learn theoretical foundations and applications of informatics and to explore technical and social issues—including policy choices, ethical issues, and legal obligations—with IT applications and solutions in various specific settings, such as business, education, healthcare, and government. Offers students a broad perspective and understanding of informatics as both a scientific field as well as a highly applied discipline in specific contexts that may help direct them to future career concentrations.

ITC 5420. Introduction to Cloud Computing Applications and Management. (2.25 Hours)
Offers an overview of theoretical and practical aspects of distributed systems and cloud computing. Cloud computing and web services are creating a huge demand for IT professionals to manage large-scale infrastructure and vast networks. Examines frameworks, techniques, and existing IT solutions to manage internet services at different levels (infrastructure, platform, and software) and to support the key characteristics of cloud computing, including virtualization, requirement for high reliability and security, extendability, and versatility.

ITC 5450. Advanced Cloud Computing Applications and Management. (2.25 Hours)
Offers a comprehensive learning experience in advanced concepts within cloud computing. Cloud computing has become a disruptive technology that has dramatically transformed the IT industry by offering scalability and delivery options that had not existed previously. Offers students an opportunity to gain an in-depth knowledge of concepts, programming models, virtualization options, file systems, architectures, storage, and secure computation, as well as to learn contemporary industry trends and what the future holds in the advanced concepts of cloud computing.

Prerequisite(s): ITC 6420 with a minimum grade of C- or ITC 6420 with a minimum grade of C-

ITC 5480. Amazon Web Service (AWS) Cloud Architecting. (3 Hours)
Exposes students to advanced technical topics to assist in the development of expertise in AWS cloud computing. Offers students an opportunity to gain the skills needed to pursue certification as an AWS Certified Solutions Architect–Associate, one of the most valuable IT certificates. Includes reading materials provided by AWS Academy, guided instruction in the classroom, hands-on labs operated by AWS, project work, and free practice exam if students wish to pursue certification after completing the course. Successful students have the ability to demonstrate knowledge and skills of how to architect and deploy secure and robust applications on AWS technologies.

ITC 5490. Ethical Hacking. (2.25 Hours)
Exposes students to the different phases of hacking, specific skills for penetration/intrusion testing, and demonstrates hands-on techniques in ethical hacking. Offers students an opportunity to gain technical capabilities to secure information systems, conduct network scanning and enumeration, and learn social engineering skills and techniques to protect networks from hackers.

ITC 5520. Cloud Security Planning and Design. (2.25 Hours)
Presents a comprehensive overview of the principles and practices of cloud computing security. Topics include the fundamentals of cloud computing security; the latest threats and attack vectors targeting cloud-based systems; and best practices for securing cloud infrastructure, applications, and data. Covers technical tools to protect data, data privacy, information systems, and enterprise networks from external compromise. Explores the field of cybersecurity: the body of technologies, processes, and practices designed to protect networks, devices, programs, and data from attack, damage, or unauthorized access. Examines the components of a well-architected cybersecurity framework, identifies the tools required, and guides students to create plans that will protect the digital assets of the enterprise.

ITC 6000. Database Management Systems. (3 Hours)
Covers the use and capabilities of modern database management systems with an emphasis on performance and reliability. After a brief review of conceptual data models and database design, the focus moves to the underlying technology—database engines, storage and indexing, memory use, the relational model, normalization/de-normalization, query processing, and SQL. Also discusses the need for and design of concurrency control, integrity, security, and recovery capabilities.

ITC 6010. Information Technology Strategy and Governance. (3 Hours)
Focuses on the strategic use of information technology (IT) from a business perspective at the enterprise level. Covers business fundamentals and a strategic framework for aligning organizational strategy, core competencies, and information systems. Covers strategic IT management, including IT policy and governance, accountability frameworks, financial analysis, risk management, and legal compliance issues.

ITC 6015. Enterprise Information Architecture. (3 Hours)
Introduces the theory, framework/model, methodology, and tools that enhance business and organizations' ability to discover, access, and understand data and to integrate IT and information resources, with an ultimate goal to produce information needed to make critical decisions and support business functions. Data and information management is critical to modern businesses. Covers best practices using cases studies in a more practical, comprehensive approach to delivering the subject matter involving the application of tools.

ITC 6020. Information Systems Design and Development. (3 Hours)
Discusses the planning, analysis, design, and implementation of computer-based information systems, focusing on the methodologies and procedures used in organizational problem solving and systems development. Topics include the systems development life cycle; project management; requirements analysis and specification; feasibility and cost-benefit analysis; logical and physical design; prototyping; system validation, deployment, and postimplementation review. Additional topics may include platform and database selection and integration issues, CASE tools, end-user training, maintenance, and object-oriented analysis and design.

ITC 6030. Computer Systems and Networks. (3 Hours)
Introduces the basic concepts of computer systems and networks. Covers operating system services, file systems, resource management, synchronization, the concept of a process, and process cooperation and interference. Introduces networks, including network architectures, network protocols, and communication paradigms (point-to-point, multicast/broadcast, and connectionless vs. connection-oriented). Uses examples from real operating systems and networks (Unix, Linux, Windows, TCP/IP, and Ethernet) to reinforce the concepts.

ITC 6035. Information Technology Project Management. (3 Hours)
Covers the tools and techniques used to manage information technology (IT) projects. Topics include project planning, scheduling, and budgeting; project management tools (i.e., PERT/CPM/GANTT); and human resources management. Discusses all phases of IT projects from proposal writing through postrelease maintenance issues. Offers students an opportunity to plan and develop a project that provides a practical application of the topics covered in class.

ITC 6040. Informatics Capstone. (3 Hours)
Offers students an opportunity to produce a polished paper, presentation, or product that reflects their training and focus in the fields of information systems (IS) and information technology (IT). Emphasizes aspects of integrating IS systems, technical architectures, and enterprise functions. Also offers students an opportunity to incorporate issues involving research and development or business and market strategies. Strongly encourages students to create a portfolio piece that can be shown to potential employers or current supervisors.

Prerequisite(s): ITC 6000 with a minimum grade of C- ; ITC 6010 with a minimum grade of C- ; ITC 6020 with a minimum grade of C- ; ITC 6035 with a minimum grade of C- ; ITC 6400 with a minimum grade of C- ; INT 6940 with a minimum grade of C-

ITC 6045. Information Technology Policy, Ethics, and Social Responsibility. (3 Hours)
Explores the policy choices, ethical issues, and legal obligations faced by organizations in the information age. Topics include intellectual property, freedom of expression, privacy, national security, impact of information technology (IT) on the work and home lives of employees, and ethical codes of conduct for IT professionals. Intended to sensitize IT managers and professionals to the issues that arise when doing business in an interconnected world and to develop an understanding of how to ethically and legally operate and use modern computer systems and networks.

ITC 6082. Network Protection. (3 Hours)
Examines the technical methods used to ensure that information using wired and wireless media reaches only those for whom it was intended. Covers the technical tools to protect information from external compromise. Explores load balancing, wireless access, Web security issues, and network intrusion detection. Offers students an opportunity to develop a detailed understanding of authentication, firewall configuration, and rule sets and to learn to address and prevent security issues related to intranets, extranets, enterprise networks, and the Internet.

ITC 6300. Foundations of Information Security. (3 Hours)
Offers an overview of the threats to the security of information systems, the responsibilities and basic tools for information security, and the levels of training and expertise needed in organizations to reach and maintain a state of acceptable security. Topics include an introduction to confidentiality, integrity and availability, authentication, encryption and access controls, intrusion detection and response, social engineering, physical security, policy formation and enforcement, legal and social issues, and risk management.

ITC 6305. IT Infrastructure (Systems, Networks, Telecom). (3 Hours)
Introduces the elements of IT infrastructure—systems, networks, and telecommunications. Telecommunication fundamentals include data, voice, image, and video. Covers the concepts, models, architectures, protocols, standards, and security for the design, implementation, and management of digital networks. Discusses the essentials of local area networks (LANs), metropolitan area networks (MANs), and wide area networks (WANs).

ITC 6315. Information Security Risk Management. (3 Hours)
Focuses on assessing, modeling, communicating, and addressing risk issues. Covers statistical, financial, technical, and other risk-assessment and risk-modeling techniques and tools. Explores policy and governance frameworks for information security risk management and the legal, behavioral, and social issues that arise in implementing security policies. Offers students an opportunity to develop risk assessments and present and justify mitigation proposals.

ITC 6330. CISSP Preparation. (3 Hours)
Includes all ten domains that make up the body of knowledge covered by the CISSP examination. Offers students an opportunity to obtain the knowledge and technical concepts required to achieve this certification. Topics include security management practices; access control systems; telecommunications and network security; cryptography; security architecture and models; operations security; applications and systems development; business continuity planning and disaster recovery planning; law, investigation, and ethics; and physical security. The CISSP certification is governed by the International Information Systems Security Certifications Consortium and is universally recognized as a key component in the selection process for management-level information security positions.

ITC 6345. Systems and Network Administration. (3 Hours)
Focuses on the skills, tools, and best practices required to provide and support computing infrastructure and services. Covers system installation and configuration, defining users and groups, user authentication, file systems, configuring and managing system and network services, client/server systems, and Web site administration. Also discusses troubleshooting, backup/recovery, security issues and policies, user/customer interaction, and the ethical and legal responsibilities of a system administrator.

ITC 6355. Web Application Design and Development. (3 Hours)
Introduces the development of Web applications. Topics covered include Web servers, Web application servers, Web application development methods, client-side and server-side scripting, and Web application development techniques. Offers students an opportunity to learn to construct and maintain a well-designed Web site and use state-of-the-art Web application development tools and languages to develop Web applications. Other topics include Web application security, session management, design patterns, and reusable Web application components.

ITC 6400. Foundations of Informatics. (3 Hours)
Introduces the fundamental properties of information, technologies, and people within an increasingly complex infrastructure and social system. Offers students an opportunity to learn theoretical foundations and applications of informatics and to explore technical and social issues—including policy choices, ethical issues, and legal obligations—with IT applications and solutions in various specific settings, such as business, education, healthcare, and government. Offers students a broad perspective and understanding of informatics as both a scientific field as well as a highly applied discipline in specific contexts that may help direct them to future career concentrations.

ITC 6410. Fundamentals of Human Behaviors for Interactive Systems. (3 Hours)
Introduces basic principles of cognitive and social psychology relevant to the design and use of interactive systems and applications. Offers students an opportunity to examine topics including human perception (e.g., how we identify, organize, and interpret information); human memory capacity and operation (e.g., how we recognize and recall information, and how we learn to develop skills and expertise); and human reasoning and decision making. Understanding how the human mind works and the limitation of our mental capacities may ultimately provide valuable insights to apply user-centered approaches in interface design as well as interactive systems development.

ITC 6420. Introduction to Cloud Computing Applications and Management. (3 Hours)
Offers an overview of theoretical and practical aspects of distributed systems and cloud computing. Cloud computing and web services are creating a huge demand for IT professionals to manage large-scale infrastructure and vast networks. Examines frameworks, techniques, and existing IT solutions to manage internet services at different levels (infrastructure, platform, and software) and to support the key characteristics of cloud computing, including virtualization, requirement for high reliability and security, extendability, and versatility.

ITC 6450. Advanced Cloud Computing Applications and Management. (3 Hours)
Offers a comprehensive learning experience in advanced concepts within cloud computing. Cloud computing has become a disruptive technology that has dramatically transformed the IT industry by offering scalability and delivery options that had not existed previously. Offers students an opportunity to gain an in-depth knowledge of concepts, programming models, virtualization options, file systems, architectures, storage, and secure computation, as well as to learn contemporary industry trends and what the future holds in the advanced concepts of cloud computing.

Prerequisite(s): ITC 6420 (may be taken concurrently) with a minimum grade of C-

ITC 6460. Cloud Analytics. (3 Hours)
Introduces students to a set of techniques, tools, and applications to help clients extract and harvest information from massive data (e.g., social media sites, e-commerce websites) through a cloud platform adopted by a business. Also introduces techniques to help clients migrate historical data to cloud systems, as new cloud systems provide contemporary analytics solutions. Offers students an opportunity to gain the technical strength to assist data analytics process and business intelligence in the context of a cloud computing platform. Cloud analytics is an emerging topic that helps establish a cloud computing service mode, aiming to assist and facilitate data analytics process through a public or private cloud.

ITC 6480. Amazon Web Service (AWS) Cloud Architecting. (4 Hours)
Exposes students to advanced technical topics to assist in the development of expertise in AWS cloud computing. Offers students an opportunity to gain the skills needed to pursue certification as an AWS Certified Solutions Architect–Associate, one of the most valuable IT certificates. Includes reading materials provided by AWS Academy, guided instruction in the classroom, hands-on labs operated by AWS, project work, and free practice exam if students wish to pursue certification after completing the course. Successful students have the ability to demonstrate knowledge and skills of how to architect and deploy secure and robust applications on AWS technologies.

ITC 6490. Ethical Hacking. (3 Hours)
Exposes students to the different phases of hacking, specific skills for penetration/intrusion testing, and demonstrates hands-on techniques in ethical hacking. Offers students an opportunity to gain technical capabilities to secure information systems and protect networks from hackers.

ITC 6520. Network Protection and Cloud Security. (3 Hours)
Studies technical tools to protect data, data privacy, information systems, and enterprise networks from external compromise. As enterprises evolve to handle speed, volume and types of data, enterprises must protect data, detect system comprises, and provide strategies for damage recovery. Students will have the opportunity to explore the field of cybersecurity, the body of technologies, processes, and practices designed to protect networks, devices, programs, and data from attack, damage, or unauthorized access. Offers students an opportunity to understand the components of a well-architected cybersecurity framework; to identify the tools required; and to create a plan that will protect the digital assets of the enterprise.

Prerequisite(s): ITC 6420 with a minimum grade of C-

ITC 6530. Security Analytics. (3 Hours)
Focuses on the knowledge and skills necessary to successfully handle security incidents based on real-time experience. Offers students an opportunity to analyze security risks, threats, and intrusion types as they develop security measures to protect an organization's computer networks and information systems. Studies how security analytics provide small, medium, and large organizations with visibility into complex attack techniques, such as data exfiltration, lateral movement, and compromised credentials. These cybersecurity skills are in high demand by employers.

ITC 6962. Elective. (1-4 Hours)
Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

ITC 6980. Capstone. (1-4 Hours)
Offers students an opportunity to integrate their course work, knowledge, and experiences into a capstone project.

Prerequisite(s): ITC 6100 with a minimum grade of C- ; ITC 6150 with a minimum grade of C- ; ITC 6200 with a minimum grade of C- ; ITC 6250 with a minimum grade of C- ; ITC 6300 with a minimum grade of C-

ITC 6983. Topics. (1-4 Hours)
Covers special topics in information technology. May be repeated without limit.

ITC 7962. Elective. (1-4 Hours)
Offers elective credit for courses taken at other academic institutions.

ITC 7995. Project. (1-4 Hours)
Offers students a focused project experience to conduct in-depth research or produce a tangible product related to dominant topics in informatics. May be repeated up to three times for a maximum of 12 quarter hours.