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 1100. Human-Computer Interaction. 3 Hours.
Surveys human-computer interaction concepts, theory, and practice, focusing on its interdisciplinary nature. Describes the principles of human-computer interaction 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 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.

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.

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.

ITC 2020. Digital Collaboration and Team Building. 3 Hours.
Offers a course for students with advanced skills in productivity tools who would benefit from learning about effective strategies in using online collaboration tools in order to be more effective communicating with classmates and colleagues who are not colocated. Utilizes the main functionalities of collaborative platforms. Emphasizes data gathering, analysis, and sharing.

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.

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.

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.

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.

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.

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. 3 Hours.
Extends introductory programming concepts. Focuses on developing complex end-user applications that address a business problem or opportunity. Topics include utilizing database interfaces and managing user sessions.

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.

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.
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.

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.

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.

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.

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.

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 multisuser 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.

ITC 4260. Database Administration. 3 Hours.
Offers students an opportunity to obtain a conceptual understanding of the database architecture and how the various components work and interact with each other. Topics include the creation and maintenance of a relational database. Practical hands-on training includes management of database instances, log files, control files, backup management, and an understanding of the data dictionary.

ITC 4500. 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.

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).

ITC 4650. Compliance and Risk Issues in Information Technology. 3 Hours.
Explores questions such as: Are your IT systems built, used and managed according to organizational policies? Are they in compliance with international, national, and local legal requirements? What are the potential risks and legal liabilities associated with your IT systems and procedures? Seeks to develop frameworks for assessing gaps between what your organization is doing and should be doing to protect the organization and its stakeholders.

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 4840. Preparation for Information Technology Project. 3 Hours.
Offers students an opportunity to apply their knowledge of systems analysis to develop a comprehensive written business case for an IT project. Reviews the principles of developing a business case and high-level solution model. Working closely with the instructor, students are asked to identify a technological need of actual interest for local companies, communities, or students’ workplace; research the legal, marketing, social, and organizational viability of providing a solution; and follow the systems analysis process to develop a comprehensive written proposal that documents user requirements, alternative solutions, and the selection of the most appropriate solution. The goal is to develop a formal project plan for actual execution of the solution in ITC 4850.

ITC 4850. Information Technology Project. 3 Hours.
Offers students an opportunity to apply their knowledge of systems analysis to develop a comprehensive written business case for an IT project. Reviews the principles of developing a business case and high-level solution model. Working closely with the instructor, students are asked to identify a technological need of actual interest for local companies, communities, or students’ workplace; research the legal, marketing, social, and organizational viability of providing a solution; and follow the systems analysis process to develop a comprehensive written proposal that documents user requirements, alternative solutions, and the selection of the most appropriate solution. A formal project plan is then developed for actual execution of the solution.
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 4990. Elective. 1-4 Hours.
Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

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.
Discussess 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.

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 6080. Network Security Concepts. 3 Hours.
Focuses on security concepts, issues, terms, and definitions, as well as the strategic value of being secured. Key topics include planning for network security, security and network protocols, end-user and administrator training, and securing existing networks. Addresses management issues related to network security, including the ethical considerations that arise from decisions regarding access, reporting, monitoring, and use.

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 6310. Information Security Governance. 3 Hours.
Covers the foundations for the policy, law, regulatory, and ethical accountability frameworks that information security risk managers must work within. Information security governance is an overarching consideration in all risk-management-related endeavors, and it is understood to be of supreme importance for information security since many issues have legal, regulatory, policy, and ethical considerations.

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 6320. Information Security Technology. 3 Hours.
Covers key information security technologies and the context needed for deploying them successfully. Security technology has come a long way, and organizations need to deploy a variety of security devices and tools, such as intrusion detection systems and firewalls, to solve the most pressing information security problems.

ITC 6325. CISA Preparation. 3 Hours.
Includes all seven domains that make up the body of knowledge covered by the CISA examination. Offers students an opportunity to obtain the knowledge and technical concepts required to achieve this certification. Topics include technical infrastructure and operations, management planning and organization of information systems, applications development, protection of information assets, business process evaluations and risk management, disaster recovery planning, and the formal audit process.

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 Security Certifications Consortium and is universally recognized as a key component in the selection process for management-level information security positions.

ITC 6335. Data Warehousing and Data Mining. 3 Hours.
Focuses on the management, mining, and interpretation of patterns in large databases. Offers students an opportunity to learn how organizations construct data warehouses from operational databases, about different data warehouse architectures, how to build a data warehouse, and how to structure databases for efficient data mining. Introduces data mining techniques such as rule-based learning, decision trees, association rule mining, and statistical analysis. Also covers interpretation of the mined patterns using visualization techniques.

ITC 6340. Mobile and Wireless Networks and Applications. 3 Hours.
Presents the latest in wireless technologies and mobile business (m-business). Topics include wireless networks, wireless carriers, location-based technologies, wireless platform operating systems and micro-browsers, wireless marketing and customer/client relationship management, wireless security issues, and Wireless Application Protocol (WAP). Offers students an opportunity to engage in the applied design and development of mobile applications using Web technologies and tools.

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 6430. Enterprise Information Technology Service Management. 3 Hours.
Examines frameworks and strategic approaches for the life cycle management of IT products—including planning, designing, developing, delivering—and for improving the IT services from a higher-level enterprise perspective—including managing disparate servers throughout the organization. In the context of cloud computing, this course focuses on the strategic management of IT infrastructure, agile IT service, configuration, data and information security, and disaster recovery. Explores the strategies to provide values to customers.

ITC 6440. Mobile Technology and Security. 3 Hours.
Seeks to provide a comprehensive learning experience in the many domains that comprise mobile device technology and related security topics. Mobile technology is ubiquitous in business and personal life to the point that this technology has become a requirement in every facet of the world. Offers students an opportunity to gain an in-depth history and overview of this industry; the current providers that transform the technology; mobile designs; wireless communication technologies; user experiences, which inherently correlate to their own utilization of mobile devices; and security topics related to mobile technology.

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.

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 6470. Enterprise Data Storage and Management Technologies. 3 Hours.
Provides a comprehensive learning experience in many domains that comprise data storage and storage management technologies. Students have an opportunity to gain in-depth knowledge of storage system architecture, business continuity, storage security, and storage infrastructure management processes. Technology trends such as shared-service infrastructures, cloud computing, Big Data, and the Internet of Things are all changing the way data is processed, stored, and used in enterprises. There is an increasing need for skilled data storage architects and managers to handle manage massive amounts of data in enterprise and cloud environments.

ITC 6480. Amazon Web Service (AWS) Cloud Architecting. 4 Hours.
Exposes students to technical advanced 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 6962. Elective. 1-4 Hours.
Offers elective credit for courses taken at other academic institutions. May be repeated without limit.

ITC 7120. Healthcare Information Systems. 3 Hours.
Explores the administrative and research applications of computers in today's healthcare delivery system. Discusses emerging trends in the field of healthcare informatics.

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