

INFORMATION SYSTEMS (IS)

Note: New ISCS Course Resource Fee of \$25 per semester credit hour. Beginning Fall 2021, this fee is assessed on all undergraduate and graduate students enrolled in certain Information Systems courses in the College of Business that have specialized hardware and/or software infrastructure requirements.

Information Systems (IS) Courses

IS 1003. Unlocking Cyber. (3-0) 3 Credit Hours.

Cybersecurity is a relevant topic for everyone today, personally and professionally. This three-hour course covers core security terminology and concepts and discusses current challenges and threats faced by individuals, organizations, and nations through current topics, case studies, and hands-on labs, and career profiles. We introduce a few tools of the trade to familiarize students with the problem-solving techniques and analytical skills needed for cybersecurity and related degree programs, and with the aim of increasing awareness of the field and its critical importance to our world. Course Fees: BISP \$10; BTSI \$15; LRB1 \$15.

IS 1403. Business Information Systems Fluency. (3-0) 3 Credit Hours. (TCCN = BCIS 1305)

This course concentrates on a set of core computing skills that are essential to student success, such as using e-mail, word processing, spreadsheets, basic data management, presentation software and on- and off-campus internet resources. Microsoft Office is required to complete the projects assigned in the course. This is an online course. All coursework (lessons, exams, and projects) is completed online. Course Fees: BISP \$10; BTSI \$15; DL01 \$75; LRB1 \$15.

IS 1413. Excel for Business Information Systems. (3-0) 3 Credit Hours.

This course concentrates on the use of Microsoft Office Excel as a tool for organizing, presenting, and analyzing data. This is an online course. All coursework (lessons, exams, and projects) is completed online. Microsoft Excel is required to complete the projects assigned in the course. Successful completion of this course will help prepare the student for taking the Microsoft Office Specialist (MOS): Microsoft Office Excel Core exam. Students who are MOS certified or have taken an equivalent course that specifically prepares students for the MOS Excel exam can petition for exemption for the course. Students in quantitative majors (such as Accounting, Actuarial Science, Economics, Finance, Management Science, and Statistics and Data Science) are strongly encouraged to take this course in lieu of IS 1403. Course Fees: BISP \$10; BTSI \$15; DL01 \$75; LRB1 \$15.

IS 2053. Programming Languages I with Scripting. (3-0) 3 Credit Hours.

Prerequisites: IS 1003 with a grade of "C-" or better. This course introduces programming logic and constructs in Python and basic command line scripting in Linux and Windows environments. Control structures, arithmetic and logical operators, functions, arrays, regular expressions, classes/objects, and exception handling are covered in Python. Students will also write Bash and PowerShell scripts to execute basic processes and tasks. The emphasis will be on building problem solving and coding skills that apply to any language. Course Fees: BISP \$10; BTSI \$15; LRB1 \$15.

IS 2063. Programming Languages II with Java. (3-0) 3 Credit Hours.

Prerequisites: IS 2053 with a grade of "C-" or better. The course focuses on high-level programming constructs through the Java programming language. Students will apply an object-oriented framework to business and security problems using data structures, built-in libraries, file processing, and exception handling, and become familiar with concepts such as inheritance, polymorphism, and generics. Course Fees: BISP \$10; BTSI \$15; LRB1 \$15.

IS 3003. Principles of Information Systems for Management. (3-0) 3 Credit Hours.

An overview of fundamental MIS concepts within a framework for describing and analyzing managerial/organizational information needs. Includes coverage of hardware and software tools, information structures, various types of information systems, and formal problem-solving techniques. Issues related to organizational controls, security, and globalization, collaboration, and ethics as a result of changing technologies are discussed. A variety of assessment methods will be assigned to illustrate the use of specific tools and techniques for problem solving. Differential Tuition: \$126. Course Fee: DL01 \$75.

IS 3033. Operating Systems Security. (3-0) 3 Credit Hours.

Prerequisites: IS 2053 (IS 2031 and IS 2033 in previous catalogs). IS 3033 is a hands-on course with an emphasis on studying real-world cyber security challenges of Operating System (OS). Throughout the course, students will be introduced to the fundamental knowledge of OS such as process scheduling, memory management, I/O device and file systems etc. as well as hands-on approaches to securing and hardening the essential components of a specified OS (Unix-like or Windows). The lab exercises of this course provide students with comprehensive practices on secure operation and maintenance, secure server configuration, system-level firewalls, kernel security module, logging, and anti-malware measures, etc. Differential Tuition: \$126. Course Fee: DL01 \$75.

IS 3043. Secure Mobile App Development. (3-0) 3 Credit Hours.

Prerequisites: IS 2063 (IS 2041 and IS 2043 in previous catalogs), or the instructor's consent. As mobile devices such as smartphones and tablets become ubiquitous, the demand for mobile apps and developers who specialize in mobile technology also surges. This course teaches students how to develop a mobile app in an advanced development environment (e.g., Android Studio) and principles of secure software engineering. The course will cover requirements analysis, interface design, functionality development, testing vulnerabilities, data security and other secure software design strategies with a focus on the usability of mobile apps in the real world. This course can be an elective for the information systems major and cyber security major and minor. Differential Tuition: \$126.

IS 3063. Database Management for Information Systems. (3-0) 3 Credit Hours.

Prerequisites: IS 2053 (IS 2031 and IS 2033 in previous catalogs). A study of database management systems (DBMS) features, functions, and architecture, including logical design, data models, normalization, object-oriented data, and database administration. A DBMS product will be used to illustrate principles. Differential Tuition: \$126.

IS 3073. Application Development. (3-0) 3 Credit Hours.

Prerequisites: IS 2053 (IS 2031 and IS 2033 in previous catalogs). This course examines the use of developing applications and similar information systems techniques to solve managerial problems. Includes cases where students are asked to design and implement applications that address various classes of analytic problems. Differential Tuition: \$126.

IS 3313. Introduction to Pathogenic Outbreak Investigations. (3-0) 3 Credit Hours.

This is a cross-disciplinary introduction to genetic and digital pathogens, their characteristics and methods for rapid analysis, geared toward predicting behavior during real-time outbreak investigations. The course examines both similarities and differences between biological and digital pathogens and presents core concepts from each domain to build a cohesive base for future multi-disciplinary research. Differential Tuition: \$126.

IS 3413. Introduction to Telecommunications for Business. (3-0) 3 Credit Hours.

Includes an in-depth look at basic telecommunications terminology and concepts. Introduction to voice and data networks, signaling and multiplexing. Network topologies and protocol fundamentals and architectures are presented and compared. Ethernet, IEEE 802.11x, TCP/IP, dedicated circuit, and VPN technologies are introduced. Network security fundamentals are explored. Differential Tuition: \$126. Course Fee: DL01 \$75.

IS 3423. Network Security. (3-0) 3 Credit Hours.

Prerequisite: IS 3413 with a grade of "C-" or better or consent of instructor and Department Chair. The course provides a foundation in networking technologies that are core to creating secure networks. Topics included in this course are basic cryptography, secure networking protocols, logical and physical security management and security devices. Relation between these technologies and operational and implementation issues for these technologies will also be discussed. (Formerly titled "Secure Network Design.") Differential Tuition: \$126. Course Fee: DL01 \$75.

IS 3433. Introduction to Digital Forensics. (3-0) 3 Credit Hours.

The digital forensic investigation process involves organizational preparation, incident response, data collection, data analysis, and communication of findings. This course will teach students how to prepare for incidents, how to respond to incidents, and how to reliably collect digital data. Students will be introduced to various types of storage media and sources of volatile data. Students will also be introduced to forensic accounting principles and practices as well as fundamental legal issues related to digital forensics. Differential Tuition: \$126.

IS 3453. Networking Fundamentals. (3-0) 3 Credit Hours.

Prerequisite: IS 3413 with a grade of "C-" or better or consent of instructor. This course will focus on the principles of telecommunication with particular emphasis on networking. Networking and transmission protocols will be emphasized. Both IPv4 and IPv6 will be included. This class will also include the hardware side of the network. The role of servers, switches, and routers will be included. Security will be introduced. Differential Tuition: \$126.

IS 3513. Information Assurance and Security. (3-0) 3 Credit Hours.

Prerequisite: IS 3413 with a grade of "C-" or better or consent of instructor. This course will provide the student the opportunity to learn about the basic elements that comprise Information Assurance Security. An in-depth presentation of information assurance topics such as fraud, eavesdropping, traffic analysis, intrusion detection and prevention, hacking, viruses, cryptography, risk management, and secure architectures will be discussed. (Formerly IS 4453. Credit cannot be earned for both IS 3513 and IS 4453.) Differential Tuition: \$126. Course Fee: DL01 \$75.

IS 3523. Intrusion Detection and Incident Response. (3-0) 3 Credit Hours.

Prerequisite: IS 3513 with a grade of "C-" or better. This course will provide the student with the opportunity to learn about the elements that comprise intrusion detection and incident response. It provides an in-depth look at intrusion detection methodologies, tools, and approaches to handling intrusions when they occur. It examines the laws that address cyber crime and intellectual property issues, and includes a study of proper computer and network forensics procedures to aid in the identification and tracking of intruders and in the potential prosecution of criminal activity. Differential Tuition: \$126. Course Fee: DL01 \$75.

IS 3533. Cyber Law and Legal System. (3-0) 3 Credit Hours.

An introductory course in laws and legal issues that affect law enforcement, businesses, and investigators related to the preservation, collection, and analysis of digital data. Students will examine computer crime laws, civil and criminal laws that often involve electronic evidence, search and seizure of electronic evidence, judicial issues involving the admissibility of electronic evidence and related testimony, and legal issues involved with electronic surveillance. Differential Tuition: \$126.

IS 3833. Cyber Operations. (3-0) 3 Credit Hours.

Prerequisites: IS 3523 with a grade of "C-" or better. This course includes discussions concerning both the defensive and offensive cyber security operations. Protecting the network and the critical infrastructure will be one of the primary emphases of the course. Offensive capabilities will also be discussed. Current events, reverse malware engineering, new technologies, policies and legal subjects will also be part of this course. Differential Tuition: \$126.

IS 4023. Applied Big Data with Machine Learning. (3-0) 3 Credit Hours.

Prerequisite: IS 3073. This course provides an overview of machine learning techniques to explore, analyze, and leverage data. Students will be introduced to tools and algorithms they can use to create machine learning models that learn from data, and to scale those models up to big data problems. This course will help prepare students for more advanced courses in cyber analysis and data-driven decision making. Differential Tuition: \$126.

IS 4033. Network Operations. (3-0) 3 Credit Hours.

Prerequisite: IS 3453 with a grade of "C-" or better or consent of instructor. The course will explore the fundamentals of operating a network. Issues to be included are physical security, electrical and air conditioning issues, data storage and retention, and backup and redundancy of data. Other topics include floor loading, patch management, converting user requirements to system requirements and disaster recovery. Differential Tuition: \$126.

IS 4053. Systems Analysis and Design. (3-0) 3 Credit Hours.

Prerequisite: IS 3063 with a grade of "C-" or better. An introduction to systems theory and development techniques. Topics include problem definition, system development life cycle, feasibility analyses, project management, system models and CASE tools. Differential Tuition: \$126.

IS 4063. Advanced Topics in Information Systems. (3-0) 3 Credit Hours.

Prerequisite: 15 semester credit hours of information systems courses (excluding IS 1403 and IS 3003). Survey of recent developments in information technology. Analysis will focus on applications in the business community and theoretical developments that relate to those applications. Ordinarily taken during semester of graduation. Differential Tuition: \$126.

IS 4083. Agile Project Management. (3-0) 3 Credit Hours.

This introductory course presents concepts and techniques for leading agile teams in many types of projects including software development, engineering, construction, product development, as well as science and technology focused efforts. The course will give students the opportunity to develop an agile mindset and a range of adaptive skills including agile methods, practices and values that are associated with achieving higher levels of performance and customer satisfaction. The course will also prepare the student to sit for the Project Management Institute's PMI-ACP certification exam. Differential Tuition: \$126.

IS 4143. Wide Area Networks. (3-0) 3 Credit Hours.

Prerequisite: IS 3413 with a grade of "C-" or better or consent of instructor. This course explores telecommunication technologies associated with wide area networks. Technologies such as frame relay, MPLS, SD-WAN and VPN tunneling will be studied. The role of common carriers, leased lines and associated security and quality of service issues will also be discussed. Differential Tuition: \$126.

IS 4183. Advanced Database Concepts and Applications. (3-0) 3 Credit Hours.

Prerequisite: IS 3063 with a grade of "C-" or better. Databases play a critical role in the business operations of most organizations. This course provides an in-depth coverage on concepts governing the design and management of database systems. Topics include data modeling, database design, administration, optimization and performance evaluation, SQL language, procedures, functions and triggers. Students will have the opportunity to learn how to design and build modern database systems through a set of hands-on exercises and projects using MS SQL Server, Oracle and other contemporary database software. The course also covers some advanced topics such as database security, database connectivity and Web applications. Differential Tuition: \$126.

IS 4213. Data Center Infrastructure Planning. (3-0) 3 Credit Hours.

Prerequisite: IS 4033 with a grade of "C-" or better or consent of instructor. The purpose of this class will be to explore the electrical power, air conditioning, and fire suppressant requirements of a data center. Electrical grids, standby generators, and uninterruptible power supplies will be discussed. The course explores the various aspects of power quality, interruption of service, voltage flicker and control, voltage swells and sags and power surges. Air conditioning requirements and methods will also be included. Fire suppressant techniques will also be part of the class. A comprehensive project involving the design of the data center to include these three major issues will be part of the class. Differential Tuition: \$126.

IS 4223. Emerging Network Technologies. (3-0) 3 Credit Hours.

Cloud computing has become popular in industry. This class will look at what it is and how it works. Security issues will be an important part of the course. Other topics include virtual machines, storage area networks, software defined networks, and remote systems management. New hardware will also be included. Differential Tuition: \$126.

IS 4233. Introduction to Cloud Computing. (3-0) 3 Credit Hours.

Prerequisite: IS 2053 with a grade of "C-" or better or consent of instructor. Cloud computing has gone from a leading trend in IT to a widely adopted mainstream computing platform. This course introduces cloud computing concepts where students explore the basics of cloud services ecosystem and deployment models. Students will become acquainted with commonly used industry terms, typical business scenarios and applications for the cloud, security models, and benefits and limitations inherent in the new paradigm of computing. This course will help prepare students for more advanced courses in big data technology and cyber analysis. (Formerly titled Cloud Technologies for Business.) Differential Tuition: \$126.

IS 4463. Web Application Security. (3-0) 3 Credit Hours.

Prerequisite: IS 3513 with a grade of "C-" or better or consent of instructor. The security issues related to web applications will be discussed in this course. Topics include web application authentication, authorization, as well as browser and web database security principles. Various web application security attack types such as code injection, cross-site scripting, and cross-site request forgery will be studied. The course will also include discussions about business aspects that contribute to a secure web-based transaction environment. (Formerly titled Secure Electronic Commerce.) Differential Tuition: \$126. Course Fee: DL01 \$75.

IS 4473. Information Assurance Policy. (3-0) 3 Credit Hours.

Prerequisites: IS 3413 with a grade of "C-" or better and one 3-semester-credit-hour security course or consent of instructor. There are many policy issues, within the firm and at various levels of government, that affect information assurance. This course will examine how these policies affect electronic security. Subjects will include privacy of information, intellectual property protection, globalization of information systems, and other policy matters. The protection and control of secured information will also be discussed. Differential Tuition: \$126. Course Fee: DL01 \$75.

IS 4483. Digital Forensic Analysis I. (3-0) 3 Credit Hours.

An introductory course in collecting, examining, and preserving evidence of crimes involving digital devices. This course examines the issues, tools, and control techniques needed to successfully investigate illegal activities facilitated through the use of information technology. The tools of collecting, examining, and evaluating data in an effort to establish intent, culpability, motive, means, methods, and loss resulting from such crimes will be examined. Differential Tuition: \$126. Course Fee: DL01 \$75.

IS 4513. Industrial Control Systems. (3-0) 3 Credit Hours.

Prerequisite: IS 3513 with a grade of "C-" or better, or consent of instructor and Department Chair. Many of the critical infrastructure systems contain a system control and data acquisition (SCADA) component. Frequently, the control systems are remotely accessed and therefore become the focal point for attack. This course examines the control system components from the standpoint of vulnerability and protection. (Formerly titled Cyber and Physical Systems.) Differential Tuition: \$126.

IS 4523. Digital Forensic Analysis II. (3-0) 3 Credit Hours.

Prerequisite: IS 4483. This course examines advanced digital forensic analysis topics, tools, techniques, and control mechanisms. Advanced topics include operating system artifacts, non-standard file systems, mobile devices, malware, and volatile memory. Students will gain experience with state-of-the-art forensics tools and techniques needed to successfully investigate illegal activities perpetuated through the use of information technology. Differential Tuition: \$126. Course Fee: DL01 \$75.

IS 4533. Malware Analysis. (3-0) 3 Credit Hours.

Prerequisites: IS 3033 and IS 3513 with grades of "C-" or better, or instructor's consent. This class is designed to introduce students to concepts, tools and techniques associated with modern malicious code analysis. The course will examine the methods employed by malicious actors to prevent analysis and neutralization of their exploits and discuss ways of leveraging resources and tools to effectively examine malicious code. Safe handling practices for malware analysis such as sandboxing, virtualization, and system isolation will be taught/practiced throughout the course. Differential Tuition: \$126.

IS 4543. Cyber Attack and Defend. (3-0) 3 Credit Hours.

This course will bridge the concepts of implementing a secure network with actual cyber threats. Students will learn the necessary skills to implement key IT system components, create security policies, and understand the background of what hackers do to mandate such security measures. Students will conduct red team assessments against common infrastructure components, and monitor residual effects of attacks. Differential Tuition: \$126.

IS 4911. Independent Study. (0-0) 1 Credit Hour.

Prerequisites: A 3.0 College of Business grade point average, and approval in writing from the instructor, the Department Chair, and the Dean of the College. See academic advisor for the required forms. Independent research in an information systems topic under the direction of a faculty member. May be repeated for credit, but not more than 6 semester credit hours of independent study, regardless of discipline, will apply to a bachelor's degree. Differential Tuition: \$42.

IS 4913. Independent Study. (0-0) 3 Credit Hours.

Prerequisites: A 3.0 College of Business grade point average, and approval in writing from the instructor, the Department Chair, and the Dean of the College. See academic advisor for the required forms. Independent research in an information systems topic under the direction of a faculty member. May be repeated for credit, but not more than 6 semester credit hours of independent study, regardless of discipline, will apply to a bachelor's degree. Differential Tuition: \$126.

IS 4933. Internship in Information Systems. (0-0) 3 Credit Hours.

Prerequisites: 6 semester credit hours of information systems courses (excluding IS 1403 and IS 3003), a 2.5 UTSA grade point average, and approval in writing from the instructor, the Department Chair, and the Associate/Assistant Dean of Undergraduate Studies in the College of Business. Directed internship of at least 200 hours of work under the supervision of a professional providing students with opportunities to apply concepts, principles, and techniques learned in the classroom. Written report required. A proposal form must be completed and approved prior to registration. Internship may not be repeated for credit. Differential Tuition: \$126.

IS 4943. Internship in Cyber Security. (0-0) 3 Credit Hours.

Prerequisites: 6 semester credit hours of information systems courses (excluding IS 1403 and IS 3003), a 2.5 UTSA grade point average, and approval in writing from the instructor, the Department Chair, and the Associate/Assistant Dean of Undergraduate Studies in the College of Business. Directed internship of at least 200 hours of work under the supervision of a professional providing students with opportunities to apply concepts, principles, and techniques learned in the classroom. Written report required. A proposal form must be completed and approved prior to registration. Internship may not be repeated for credit. Differential Tuition: \$126.

IS 4953. Special Studies in Information Systems. (3-0) 3 Credit Hours.

Prerequisite: Consent of instructor. An organized course offering specialized study not normally or not often available as part of the regular course offerings. Special Studies may be repeated for credit when the topics vary, but not more than 6 semester credit hours, regardless of discipline, will apply to a bachelor's degree. Differential Tuition: \$126. Course Fee: DL01 \$75.