

# INFORMATION SYSTEMS AND CYBERSECURITY (ISC)

## Information Systems and Cybersecurity (ISC) Courses

### ISC 1003. Unlocking Cyber. (3-0) 3 Credit Hours.

Cybersecurity is a relevant topic for everyone today, personally and professionally. This course covers core security concepts and discusses common challenges and threats faced by individuals, organizations, and nations through current events, case studies, and career profiles, with the aim of increasing awareness of the field and its critical importance to our world. Students will cultivate problem-solving, analytical, and report writing skills with practical labs that include virtualization, git, the command line (Linux/Windows), scripting, artificial intelligence, and cyber ethics. (Formerly IS 1003. Credit cannot be earned for both IS 1003 and ISC 1003.) Generally Scheduled Location: Downtown Campus, Main Campus, Online/Internet. Course Fee: GASC \$10; STAB \$15.41; LRAB \$15.41; DL01 \$75.

### ISC 1203. Computational Problem Solving. (3-0) 3 Credit Hours.

This course explores computational thinking, logic, and design. Students will have the opportunity to decompose problems, recognize patterns, and develop algorithmic solutions using concepts such as Boolean logic, abstraction, decomposition, programming language paradigms, debugging, testing, and risk analysis. Design tools and techniques, such as pseudocode and flowcharting, are covered, with a focus on methodologies applicable to any programming language or system. The goal is for students to have the opportunity to develop a creative and ethical mindset towards challenges in complex technology-driven fields.

### ISC 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 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. (Formerly IS 1403. Credit cannot be earned for both IS 1403 and ISC 1403.) Generally Scheduled Location: Online/Internet. Course Fee: GASC \$10; STAB \$15.41; DL01 \$75; LRAB \$15.41.

### ISC 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, Operations and Supply Chain Management, Statistics and Data Science, and Business Analytics) are strongly encouraged to take this course in lieu of ISC 1403. (Formerly IS 1413. Credit cannot be earned for both IS 1413 and ISC 1413.) Generally Scheduled Location: Online/Internet. Course Fee: GASC \$10; STAB \$15.41; DL01 \$75; LRAB \$15.41.

### ISC 2053. Programming I. (3-0) 3 Credit Hours.

This course introduces several fundamental programming constructs and practices, including logic, algorithms, pseudocode, syntax, and code readability. Control structures, arithmetic and logical operators, functions, arrays/lists, regular expressions, classes/objects, integrated development environments, and exception handling are covered in this course. The emphasis will be on building problem-solving and coding skills that apply to any language. (Formerly titled "Programming Languages I with Scripting." Formerly IS 2053. Credit cannot be earned for both IS 2053 and ISC 2053.) Generally Scheduled Location: Main Campus, Online/Internet. Course Fee: GASC \$10; STAB \$15.41; LRAB \$15.41; DL01 \$75.

### ISC 2063. Programming II. (3-0) 3 Credit Hours.

Prerequisite: ISC 2053, or equivalent, with a grade of "C-" or better. The course focuses on high-level programming constructs by way of an object-oriented programming language that not only covers fundamental concepts but includes abstract data structures and libraries for text processing, file processing, and exception handling. The principles of an object-oriented framework will be applied to business and security problems. (Formerly IS 2063. Credit cannot be earned for both IS 2063 and ISC 2063.) Generally Scheduled Location: Main Campus, Online/Internet. Course Fee: GASC \$10; STAB \$15.41; LRAB \$15.41; DL01 \$75.

### ISC 2073. Secure Computer Architecture. (3-0) 3 Credit Hours.

Prerequisite: ISC 1003, or equivalent, with a grade of "C-" or better. This course covers foundational elements of computer architecture and organization. Topics will include an overview of essential hardware components and devices, the components of the central processing unit (CPU), logic gates, combinational and sequential circuits, and computer arithmetic. The course introduces machine and assembly language programming and low-level instructions and interactions with the aim of identifying vulnerabilities and securing systems in various computing environments.

### ISC 2083. Advanced Scripting. (3-0) 3 Credit Hours.

Prerequisite: ISC 2053, or equivalent, with a grade of "C-" or better. This course offers an in-depth exploration of systems-level programming across multiple environments, specifically focusing on Bash, PowerShell, and C. Bash and Windows scripting with a focus on automation in Unix/Linux and Windows environments in areas such as file manipulation, process control, and system administration. An introduction to C includes memory management, data structures, and low-level system interactions. The course emphasizes secure coding, robust testing and debugging, and operational efficiency.

### ISC 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, 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. (Formerly IS 3003. Credit cannot be earned for both IS 3003 and ISC 3003.) Generally Scheduled Location: Main Campus, Online/Internet. This course has Differential Tuition. Course Fee: DL01 \$75.

**ISC 3033. Operating Systems and Security. (3-0) 3 Credit Hours.**

Prerequisite: ISC 1003, or equivalent, with a grade of "C-" or better.

This course provides an in-depth exploration of the real-world security challenges faced by modern operating systems (OSs). Topics emphasize foundational concepts and systems administration skills in various environments with practical application through labs and exercises. (Formerly IS 3033. Credit cannot be earned for both IS 3033 and ISC 3033.) Generally Scheduled Location: Main Campus, Online/Internet. This course has Differential Tuition. Course Fee: DL01 \$75; ISCA \$75.

**ISC 3043. Mobile App Development. (3-0) 3 Credit Hours.**

Prerequisite: ISC 2063, or equivalent, with a grade of "C-" or better.

The demand for mobile apps and developers who specialize in mobile applications continues to increase. In this course, students learn how to develop a mobile app in an advanced development environment (e.g., Android Studio) with a focus on interactive experiences and principles of secure software engineering. The course will cover requirements analysis, UI/UX design, functionality development, vulnerability testing, and data security strategies. (Formerly IS 3043. Credit cannot be earned for both IS 3043 and ISC 3043.) This course has Differential Tuition.

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

Prerequisite: ISC 1203, or equivalent, with a grade of "C-" or better. A study of database management systems (DBMS) features, functions, and architecture, including database conceptual design, data models, entity relationship diagrams, database query design, and database administration. A contemporary DBMS product will be used to illustrate principles in a relational database. (Formerly IS 3063. Credit cannot be earned for both IS 3063 and ISC 3063.) This course has Differential Tuition. Course Fees: ISCA \$75; DL01 \$75.

**ISC 3073. Application Development. (3-0) 3 Credit Hours.**

Prerequisite: ISC 2053, or equivalent, with a grade of "C-" or better. This course examines the challenges, techniques, and methodologies involved in building, testing, maintaining, and enhancing software applications and packages. Students will address implementation and deployment issues; analysis and testing of code will be included. A brief introduction to data analytics is included with reference to how such analytics support application development and operations. (Formerly IS 3073. Credit cannot be earned for both IS 3073 and ISC 3073.) This course has Differential Tuition.

**ISC 3413. Telecommunications and Networking. (3-0) 3 Credit Hours.**

Prerequisite: ISC 1003, or equivalent, with a grade of "C-" or better.

This course presents the principles of data transmission in telecommunications and networks. Topics include network hardware and topologies, the OSI model, the TCP/IP stack, subnetting, and routing. Ethernet, wireless, radio, and satellite technologies will be covered, along with discussions of performance, efficiency, and security. Students will apply their knowledge in hands-on labs and exercises. (Formerly IS 3413. Credit cannot be earned for both IS 3413 and ISC 3413.) Generally Scheduled Location: Main Campus, Online/Internet. This course has Differential Tuition. Course Fee: DL01 \$75; ISCA \$75.

**ISC 3423. Network Security. (3-0) 3 Credit Hours.**

Prerequisite: ISC 3413, or equivalent, with a grade of "C-" or better.

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 IS 3423. Credit cannot be earned for both IS 3423 and ISC 3423.) Generally Scheduled Location: Main Campus, Online/Internet. This course has Differential Tuition. Course Fee: DL01 \$75; ISCA \$75.

**ISC 3433. Cyber Crime Investigation Principles. (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 fundamental legal issues related to digital forensics. (Formerly titled "Introduction to Digital Forensics." Formerly IS 3433. Credit cannot be earned for more both IS 3433 and IS 3433.) Generally Scheduled Location: Main Campus, Online/Internet. This course has Differential Tuition. Course Fee: ISCA \$75; DL01 \$75.

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

Prerequisite: ISC 3413, or equivalent, with a grade of "C-" or better.

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 3513. Credit cannot be earned for more both IS 3513 and ISC 3513.) Generally Scheduled Location: Main Campus, Online/Internet. This course has Differential Tuition. Course Fee: DL01 \$75; ISCA \$75.

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

Prerequisite: ISC 3033 and ISC 3513, or equivalents, 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. (Formerly IS 3523. Credit cannot be earned for both IS 3523 and ISC 6523.) Generally Scheduled Location: Main Campus, Online/Internet. This course has Differential Tuition. Course Fee: DL01 \$75; ISCA \$75.

**ISC 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. (Formerly IS 3533. Credit cannot be earned for both IS 3533 and ISC 3533.) This course has Differential Tuition. Course Fee: DL01 \$75.

**ISC 3543. Ethics, Policy, and Law in Information Security and Systems. (3-0) 3 Credit Hours.**

This course explores the ethical, legal, and governance challenges inherent in the collection, warehousing, and analysis of system and user data across various technological environments, including those that integrate artificial intelligence (AI) and machine learning (ML) applications. Students will discuss information accuracy, privacy, and ethical dilemmas in the context of electronic data propagation through automated analysis, prediction, and security practices, using case studies and practical exercises that highlight the complex interplay between technology, ethics, and the law. Responsible decision-making is applied through the development of a code of ethics and policy documents. (Formerly Titled: "Cyber Analytics Policy, Law and Ethics." Formerly IS 3543. Credit cannot be earned for both IS 3543 and ISC 3543.) This course has Differential Tuition.

**ISC 3833. Cyber Operations. (3-0) 3 Credit Hours.**

Prerequisite: ISC 3523, or equivalent, with a grade of "C-" or better. This course investigates cyber operations, defining terms and discussing modern defensive and offensive cybersecurity strategies. Enterprise-level network protection will be addressed in the context of the cybersecurity operations center (CSOC), to include capabilities and technologies as well as organization and policies. Offensive cyber operations will be discussed in the context of red teaming and aggressor operations. Recent/current events will be examined as case studies. (Formerly IS 3833. Credit cannot be earned for both IS 3833 and ISC 3833.) This course has Differential Tuition. Course Fee: ISCA \$75.

**ISC 4013. Information Technology Administration I. (3-0) 3 Credit Hours.**

Prerequisite: ISC 3413, or equivalent, with a grade of "C-" or better. This course educates students on host, network, platform, and enterprise-level system administration and integration through hands-on projects. Topics may include, but are not limited to, enterprise infrastructure design, system requirements and selection, and system configuration and management. Students will also learn about system reliability and service provision. (Formerly IS 4013. Credit cannot be earned for both IS 4013 and ISC 4013.) This course has Differential Tuition. Course Fee: DL01 \$75.

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

Prerequisite: ISC 2053, or equivalent, with a grade of C- or better. 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 (ML) models that learn from data, and to scale those models up to big data problems. ML concepts covered include neural networks, support vector machines, and random forests. This course emphasizes a focus on the three major steps in the data analysis pipeline: 1) Data collection methods and techniques, 2) Data storing and feature engineering methods, and 3) Data modeling (supervised and unsupervised methods). The language of choice for this course is Python. (Formerly IS 4023. Credit cannot be earned for both IS 4023 and ISC 4023.) This course has Differential Tuition. Course Fee: ISCA \$75.

**ISC 4043. Natural Language Processing. (3-0) 3 Credit Hours.**

Prerequisite: ISC 4023, or equivalent, with a grade of C- or better. Natural Language Processing (NLP) employs computational tools to process, understand, and communicate using human (natural) language. NLP is a multi-disciplinary subject applicable to computational social science, humanities, biomedical informatics, business, cybersecurity, and a wide range of other fields. In this class, students will (1) gain hands-on experience implementing traditional NLP applications, including, but not limited to, text classification, part-of-speech tagging, parsing, coreference resolution, and machine translation, and (2) practice applying NLP techniques to real-world problems. (Formerly IS 4043. Credit cannot be earned for both IS 4043 and ISC 4043.) This course has Differential Tuition.

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

Prerequisite: ISC 3063, or equivalent, with a grade of "C-" or better. An introduction to the systems analysis and design process. Topics include project selection, feasibility analyses, project management, problem and scope definition, modeling, interface design, and system implementation. Cybersecurity concerns that may arise during the systems development lifecycle are also addressed. (Formerly IS 4053. Credit cannot be earned for both IS 4053 and ISC 4053.) This course has Differential Tuition. Course Fee: DL01 \$75.

**ISC 4063. Advanced Topics in Information Systems and Technology. (3-0) 3 Credit Hours.**

Prerequisite: 15 semester credit hours of information systems courses (excluding ISC 1403, ISC 1413, and ISC 3003, and their equivalents). Survey of recent developments in information technology with emphasis on the Electromagnetic Spectrum (EMS) and Radio Frequency (RF) applications. Analysis will focus on applications in the business community and theoretical developments that relate to those applications. (Formerly IS 4063. Credit cannot be earned for both IS 4063 and ISC 4063.) This course has Differential Tuition. Course Fees: ISCA \$75; DL01 \$75.

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

This introductory course presents concepts and techniques for leading agile teams in various types of projects in organizations including software development, engineering, construction, and product development, as well as science and technology-focused efforts. The course will provide students the opportunity to develop an agile mindset and a range of adaptive skills, including agile methodologies, practices, and values that are associated with achieving higher levels of performance and customer satisfaction. This course is structured around the concepts and skills covered in the Project Management Institute's (PMI) PMI-ACP certification exam. (Formerly IS 4083. Credit cannot be earned for both IS 4083 and ISC 4083.) This course has Differential Tuition.

**ISC 4113. Information Technology Administration II. (3-0) 3 Credit Hours.**

Prerequisite: ISC 4013, or equivalent, with a grade of "C-" or better. This course educates students on advanced host, network, platform, and enterprise-level administration and integration through hands-on projects. Topics may include but are not limited to database administration, server administration, enterprise-level access control and group policy management, virtualization, enterprise data storage and retrieval, and emergent technology integration. (Formerly IS 4113. Credit cannot be earned for both IS 4113 and ISC 4113.) This course has Differential Tuition.

**ISC 4143. Advanced Telecommunications and Networking. (3-0) 3 Credit Hours.**

Prerequisite: ISC 3413, or equivalent, with a grade of "C-" or better. This course covers a variety of networking technologies and protocols that intersect over wide-area networks (WANs), mobile, Internet of Things (IoT), and the cloud. Students will examine topics such as software-defined networking, various wireless protocols (cellular, Wi-Fi, Bluetooth, etc.), and personal and private/public sector uses of low-power devices. The course will also address how distributed networking technologies (e.g., fog and edge) work with the cloud to transmit data over mobile and IoT devices. (Formally titled "Wide Area Networks." Formerly IS 4143. Credit cannot be earned for both IS 4143 and ISC 4143.) This course has Differential Tuition.

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

Prerequisite: ISC 3063, or equivalent, 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. (Formerly IS 4183. Credit cannot be earned for both IS 4183 and ISC 4183.) This course has Differential Tuition. Course Fee: ISCA \$75.

**ISC 4223. Frontiers in Technology. (3-0) 3 Credit Hours.**

This course advances into the forefront of technological innovation, examining cutting-edge advancements and their profound impact on society, economy, and culture. Students will explore a diverse range of emerging technologies, including artificial intelligence, augmented/virtual reality, biotechnology, blockchain, machine learning, and quantum computing. The course emphasizes the global implications of these technologies, analyzing their potential benefits and risks and their ethical considerations. (Formerly Titled: "Emerging Network Technologies." Formerly IS 4223. Credit cannot be earned for both IS 4223 and ISC 4223.) This course has Differential Tuition. Course Fees: DL01 \$75; ISCA \$75.

**ISC 4233. Cloud Computing. (3-0) 3 Credit Hours.**

The course provides an introduction to cloud computing and cloud security. The course covers the foundational concepts required to securely operate in the cloud, including cloud architectures, guiding security design principles, design patterns and workflows, industry standards, and applied technologies, with an emphasis on established methodologies and best practices. Students will work with real-world case studies and hands-on exercises. (Formerly IS 4233. Credit cannot be earned for both IS 4233 and ISC 4233.) This course has Differential Tuition. Course Fees: GASC \$10; STAB \$15.41; LRAB \$15.41; DL01 \$75; ISCA \$75.

**ISC 4263. Information Systems and Technology Capstone. (3-0) 3 Credit Hours.**

Prerequisite: 15 semester credit hours of information systems courses (excluding ISC 1403, ISC 1413, and ISC 3003, and their equivalents). This capstone course in the Information Systems and Technology degree program offers students a cumulative, team-based project experience that encompasses the entire lifecycle of managing an enterprise-level information system from systems analysis and design to implementation and testing. Students will have the opportunity to identify a real-world problem, design a viable solution, and implement a working prototype, integrating key concepts from their coursework, including telecommunications, database management, application development, cloud computing, project management, and more. This course has Differential Tuition. Course Fee: ISCA \$75; DL01 \$75.

**ISC 4303. AI-Driven Cybersecurity. (3-0) 3 Credit Hours.**

Prerequisite: ISC 1003 and ISC 2053, or equivalents, with a grade of "C-" or better. This course explores the integration of artificial intelligence (AI) and machine learning (ML) into cybersecurity. Students investigate how AI/ML can automate and improve processes such as anomaly detection, patch management, incident response, and threat mitigation, and at the same time, introduce sophisticated attack vectors through AI-driven social engineering and vulnerability exploitation. Critical concerns around algorithmic bias, transparency, safety, and trustworthiness are discussed. This course has Differential Tuition.

**ISC 4333. IoT and Pervasive Computing. (3-3) 3 Credit Hours.**

Prerequisite: ISC 3413, or equivalent, with a grade of "C-" or better. The course examines pervasive computing architectures and ecosystems through a variety of mobile, wearable, and embedded devices. We discuss the positive and negative impacts of "smart" devices in the context of features such as convenience, wellness, safety, privacy, surveillance, and data access and collection. Practical projects involve best practices in investigating and securing various interconnected devices. This course has Differential Tuition.

**ISC 4403. Applied Cryptography. (3-0) 3 Credit Hours.**

Prerequisite: ISC 3423, or equivalent, with a grade of "C-" or better. This course provides a practical introduction to modern cryptographic techniques and their applications. Students explore both theoretical foundations and hands-on implementation of cryptographic algorithms. Topics include classical ciphers, symmetric and asymmetric encryption, hash functions, digital signatures, key management, and classical, quantum, and post-quantum cryptographic protocols. The course emphasizes the application of cryptographic libraries and tools to address real-world challenges in secure communication and data protection. This course has Differential Tuition.

**ISC 4443. Cyber Analytics I. (3-0) 3 Credit Hours.**

Prerequisite: ISC 4023 and ISC 3523, or equivalents, with a grade of "C-" or better. This integrative course will build upon students' cybersecurity and data analytics knowledge. Students will be given an opportunity to gain valuable experience with industry standard tools, platforms, and business processes for collecting, curating, sharing, and analyzing cyber data to proactively hunt for, reactively respond to, and investigate cyber threats. Analysis of low-level data from a wide variety of devices and sensors onto cyber threat frameworks for sense making in triaging and event reconstruction will be presented. Students will have an opportunity to gain extensive hands-on experience with proprietary and open-source cyber analytics tools. (Formerly IS 4443. Credit cannot be earned for both IS 4443 and ISC 4443.) This course has Differential Tuition.

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

Prerequisite: ISC 2063, or equivalent, with a grade of "C-" or better. The security issues related to web applications will be discussed in this course. Topics include web application, authentication, and authorization, browser and web database security principles, and API security. Various web application security risks from the OWASP 10 will be examined through case studies and labs, such as broken access controls, code injection, cross-site scripting, server-side request forgery, and insecure design. (Formerly IS 4463. Credit cannot be earned for both IS 4463 and ISC 4463.) This course has Differential Tuition. Course Fees: DL01 \$75; ISCA \$75.

**ISC 4473. Cybersecurity Policy, Compliance, and Risk Assessment. (3-0) 3 Credit Hours.**

This course will examine how policies, compliance, and risk assessments affect information assurance and cybersecurity practices. This course will align security with business strategy through the identification and development of administrative, physical, and technical policies to mitigate risk exposure, minimize liability, and maintain regulatory compliance for global organizations, government entities, and key industry sectors such as healthcare and finance. Cybersecurity frameworks, implementation issues, and current case studies will be included, along with hands-on policy writing. (Formerly IS 4473. Credit cannot be earned for both IS 4473 and ISC 4473.) This course has Differential Tuition. Course Fee: DL01 \$75.

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

Prerequisite: Students may not enroll without having completed 60 credit hours and without having completed nine (9) hours of upper-division ISC (formerly IS) and/or CS coursework. An introductory course in digital forensic analysis. This course examines the fundamental data structures, software tools, and forensic analysis techniques commonly used to locate and recover trace evidence of crimes involving computers. This course focuses on file system forensic analysis of computer hosts and associated media. 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. (Formerly IS 4483. Credit cannot be earned for both IS 4483 and ISC 4483.) Generally offered: Fall. This course has Differential Tuition. Course Fees: GASC \$10; STAB \$15.41; LRAB \$15.41; DL01 \$75; ISCA \$75.

**ISC 4503. Cyber Analytics II. (3-0) 3 Credit Hours.**

Prerequisite: ISC 4443, or equivalent, with a grade of "C-" or better. This capstone course integrates cybersecurity and data analytics knowledge. Students focus on the human aspect of cyber analytics, both behavioral analytics involving users and threat actors, as well as the humans to which findings need to be presented and communicated from a risk, intelligence, and business perspectives. Students will be given an opportunity to learn how to apply cyber analytics concepts holistically across multiple contexts. Additionally, students will explore advanced topics, such as the role of artificial intelligence in increasingly autonomous cyber systems for intrusion detection, prevention, investigation, attribution, and other current and potential uses. (Formerly IS 4503. Credit cannot be earned for both IS 4503 and ISC 4503.) This course has Differential Tuition.

**ISC 4513. Industrial Control Systems Security. (3-0) 3 Credit Hours.**

Prerequisite: ISC 3513, or equivalent, with a grade of "C-" or better. 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. System architectures will be discussed. Current events will also be part of the class. (Formerly IS 4513. Credit cannot be earned for both IS 4513 and ISC 4513.) This course has Differential Tuition. Course Fees: ISCA \$75.

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

Prerequisite: ISC 4483, or equivalent, with a grade of "C-" or better. 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. (Formerly IS 4523. Credit cannot be earned for both IS 4523 and ISC 4523.) This course has Differential Tuition. Course Fees: DL01 \$75; ISCA \$75.

**ISC 4533. Malware Analysis. (3-0) 3 Credit Hours.**

Prerequisite: ISC 3033, or equivalent, with a grade of "C-" or better. 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 the analysis and neutralization of their exploits and discuss ways to leverage 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. (Formerly IS 4533. Credit cannot be earned for both IS 4533 and ISC 4533.) This course has Differential Tuition. Course Fees: ISCA \$75.

**ISC 4543. Cyber Attack and Defend I. (3-0) 3 Credit Hours.**

Prerequisite: ISC 3413, or equivalent, with a grade of "C-" or better; students may not enroll without having completed 60 credit hours and nine (9) hours of upper-division ISC (formerly IS) and/or CS coursework. 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. (Formerly IS 4543. Credit cannot be earned for both IS 4543 and ISC 4543.) This course has Differential Tuition. Course Fees: ISCA \$75; DL01 \$75.

**ISC 4553. Cyber Attack and Defend II. (3-0) 3 Credit Hours.**

Prerequisite: ISC 4543, or equivalent, with a grade of "C-" or better. This course will build on the cyber themes and skillsets learned in prior classes to conduct threat hunts to detect advanced persistent threats. Students will learn the necessary skills to detect networking, operating system, and application-level exploitation. Students will utilize advanced community penetration testing tools to emulate advanced persistent threats. Students will leverage community security monitoring and log management tools to conduct threat hunting. (Formerly IS 4553. Credit cannot be earned for both IS 4553 and ISC 4553.) This course has Differential Tuition.

**ISC 4563. Mobile Forensics. (3-0) 3 Credit Hours.**

Prerequisite: ISC 4483, or equivalent, with a grade of "C-" or better. This course is a project-driven, hands-on study of mobile devices from a forensics perspective. Students will implement various techniques to collect and analyze information from mobile devices used in forensic investigations. Students will learn fundamental mobile device concepts, techniques, and tools needed to acquire and analyze common mobile devices in a forensically sound manner. (Formerly IS 4563. Credit cannot be earned for both IS 4563 and ISC 4563.) This course has Differential Tuition.

**ISC 4573. Active Cyber Defense. (3-0) 3 Credit Hours.**

Prerequisite: ISC 2053, ISC 3513, and ISC 3033, or their equivalents, with a grade of "C-" or better. This course introduces students to cyber threat hunting, which involves proactively searching for cyber threats and attacks on computer networks and systems. Students will learn and experience techniques and tools used in cyber threat hunting, understand threat actor tactics, techniques, and procedures, and develop skills necessary to identify, track, and mitigate cyber threats. Topics include Indicators of Compromise (IoCs), network traffic analysis, log analysis, and threat intelligence. (Formerly IS 4573. Credit cannot be earned for both IS 4573 and ISC 4573.) This course has Differential Tuition.

**ISC 4583. Secure Healthcare Information Systems. (3-0) 3 Credit Hours.**

This course provides students with an overview of healthcare information, as well as information technology and systems used to collect and manage such information for patient care and healthcare administration. This includes, but may not be limited to, regulated patient health information (PHI), clinical trial information, healthcare financial systems, and electronic health records (EHR). Students will also become familiar with the regulatory, privacy, and other information and cybersecurity-related controls, risks, and mitigation strategies for such information, technology, and systems. (Formerly IS 4583. Credit cannot be earned for both IS 4583 and ISC 4583.) This course has Differential Tuition.

**ISC 4643. Research Support for Federal Labs. (3-0) 3 Credit Hours.**

Prerequisite: Consent of the instructor. This course is a research-based course that addresses research problems that are of interest to subject matter experts (SMEs) who work for the Federal labs. Students work closely with the SME to help solve these important concerns. The research problems cover a wide variety of issues, including conducting a literature review, developing code, proposing a new approach to a solution, and/or testing a solution. Weekly coordination with a Technical Director from a Federal Lab is part of the process. (Formerly IS 4643. Credit cannot be earned for both IS 4643 and ISC 4643.) This course has Differential Tuition.

**ISC 4893. Cybersecurity Capstone. (3-0) 3 Credit Hours.**

Prerequisite: ISC 3513, or equivalent, with a grade of "C-" or better, and 15 hours of upper-level ISC (formerly IS) courses, excluding ISC 3003 and IS 3003. This course should be taken during the final semester. This course builds upon the material in prior cybersecurity classes with an examination of the cybersecurity tactics, techniques, and procedures involved in executing cybersecurity in various business settings. Students are required to integrate their functional knowledge and understanding of the global cyber threat environment with advanced cybersecurity techniques and determine effective ways to reduce risk, detect intrusions, and resolve complex breaches so that organizations can operate in high-threat environments. Strong problem-solving skills, creative analytical procedures, and effective communication in current cybersecurity scenarios are emphasized. (Formerly IS 4893. Credit cannot be earned for both IS 4893 and ISC 4893.) This course has Differential Tuition.

**ISC 4913. Independent Study. (0-0) 3 Credit Hours.**

Prerequisite: A 3.0 college-level grade point average, and approval in writing from the instructor, the Department Chair, and the Dean of the college. Independent research in an approved 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. This course has Differential Tuition.

**ISC 4933. Internship in Information Systems and Technology. (0-0) 3 Credit Hours.**

Prerequisite: 6 semester credit hours of information systems courses (excluding ISC 1403, ISC 1413, and ISC 3003, or their equivalents), a 2.5 university grade point average, and approval in writing from the instructor, the Department Chair, and the Associate/Assistant Dean of Undergraduate Studies in the college. Directed internship of at least 160 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. May not be repeated for credit. (Formerly IS 4933. Credit cannot be earned for both IS 4933 and ISC 4933.) This course has Differential Tuition.

**ISC 4943. Internship in Cybersecurity. (0-0) 3 Credit Hours.**

Prerequisite: 6 semester credit hours of information systems courses (excluding ISC 1403, ISC 1413, and ISC 3003, or their equivalents), a 2.5 university grade point average, and approval in writing from the instructor, the Department Chair, and the Associate/Assistant Dean of Undergraduate Studies in the college. Directed internship of at least 160 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. May not be repeated for credit. (Formerly IS 4943. Credit cannot be earned for both IS 4943 and ISC 4943.) This course has Differential Tuition.

**ISC 4953. Special Studies in Information Systems and Technology. (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. This course has Differential Tuition. Course Fee: DL01 \$75.

**ISC 4963. Special Studies in Cybersecurity. (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. This course has Differential Tuition.

**ISC 4973. Special Studies in Cloud. (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. This course has Differential Tuition.