

**SCOM/HIST 441. Oral History.** 3 credits.

This course will explore the theory and practice of oral history. Through a series of readings, students will consider the many promises and challenges of the discipline, including issues related to memory, objectivity, ethics, the law, and technology. Students will also engage in an experiential learning exercise in which they collaborate to produce an oral history project. *Prerequisite: HIST 395 or permission of instructor.*

**SCOM 448. Communication, Culture and Identity.** 3 credits.

This class examines theory and research of cultural communication, and reflexively considers how communication practices construct identities and arrange social relations within diverse contexts and applied settings. *Prerequisites: Any one of the following courses: SCOM 305, SCOM 347, SCOM 348, SCOM 349, SCOM 352, or SCOM 357.*

**SCOM 449. Communication Training.** 3 credits.

Students learn to analyze organizations to manage and solve communication problems and improve organizational life. Through experiential learning students will become familiar with strategies and activities designed to help others improve their communication skills. Students gain experience leading meetings, engaging an audience, collaborating, and facilitating difficult conversations. *Prerequisites: SCOM 242, junior standing and 12 hours in speech communication, or permission of the instructor.*

**SCOM 450. Advanced Studies in Organizational Communication.** 3 credits.

Advanced studies in organizational communication is the concentration's capstone. Through case studies, readings, discussions, and experiential activities students investigate complex issues that emerge for organizations and their members. Students apply theoretical knowledge and skills as they develop organizational communication concepts to analyze a communication problem. Expertise is showcased through an applied field study in an active organization. *Prerequisite: SCOM 350 and senior standing.*

**SCOM 453. Political Campaign Communication.** 3 credits.

An advanced study of communication techniques, procedures and processes as they relate to political campaign communication. Emphasis upon the design, execution and production of various communication messages. Consideration of the impact and utilization of various technologies in political campaigns.

**SCOM 460. Public Relations Management.** 3 credits.

Intensive study and research of advanced communication management skills, theory and principles using case and field studies. Special attention to systematic and ethical management of communication and action affecting an organization's internal and external publics. *Prerequisites: SCOM 261 and SCOM 341.*

**SCOM 461. Public Relations Campaigns.** 3 credits.

The capstone course for the public relations program of study. Students further their theoretical understanding and practical skills in the processes of research, planning, communication/action, and evaluation by conducting campaigns for specific organizations. *Prerequisites: SCOM 261, SCOM 361 or SCOM 367, SCOM 383 or SCOM 386 and SCOM 460.*

**SCOM 463. International Public Relations.** 3 credits.

Explores the special professional challenges and opportunities arising from the dynamic global public relations developments characterizing the beginning of this century, taking into account social, economic, political, legal, and cultural factors as well as new media developments. *Prerequisites: SCOM 260 or permission of instructor.*

**SCOM/WRTC 465. Rhetoric of Environmental Science and Technology.** 3 credits.

This course offers an advanced study of the way the public receives, makes sense of, and influences scientific and technical information about environmental issues. Implications of these processes on environmental policy will be analyzed. Readings and assignments will concentrate on the interactions between technical and public spheres of communication, with an in-depth examination of the way the media facilitates the transfer of information between scientific communities and public audiences. *Prerequisites: GWRTC 103 or equivalent and junior or senior standing, or permission of the instructor.*

**SCOM 467. Global Public Relations Seminar.** 3 credits.

Advanced experimental learning approach combined with relevant theory and research provides students with an opportunity to enhance critical global communication knowledge and skills urgently required to meet this century's cultural, social, political and economic challenges. Students team with peers at universities worldwide in developing comprehensive strategic management programs. *Prerequisite: Permission of instructor.*

**SCOM 470. Health Communication Campaigns.** 3 credits.

The study of advanced theory and practice of communication in health

related fields. Consideration of topics relating to communication issues which affect communication interaction between health professionals and client/patients. Emphasis on the use of communication in health communication campaigns. *Prerequisite: SCOM 370.*

**SCOM/SMAD/POSC 472. Media and Politics.** 3 credits.

A study of the media's role in political campaigns, concentrating on past/present election, the media's role in covering political parties and coverage of the governing process. Discussion of electronic and print will occur. Topics to be examined include campaign videos, CSPAN, political ads, editorial cartoons, TV debates, convention coverage and radio talk show commentary.

**SCOM 490. Special Studies in Communication Studies.** 1-3 credits.

An independent study for students to pursue individual research under the guidance of faculty. Limited to senior communication studies majors in good standing with permission of school director.

**SCOM 495. Internship in Communication Studies.** 3-6 credits, repeatable to 6 credits.

Credit for the application of communication theory and skills in a directed, on-the-job learning experience. Open only to communication studies majors who meet specific criteria (see the school website). Up to six credits may be applied as electives in the communication studies' major. *Prerequisite: Permission of the school director.*

**SCOM 499. Honors in Communication Studies.** 6 credits.

Year course. *Prerequisite: Permission of the school director.*

## Computer Information Systems

### College of Business

**CIS 204. Computer Information Systems for Non-Business Majors.** 3 credits.

An introduction to computer-based information systems. Emphasis is placed on the role of computers in business and society, computer hardware and software, design and implementation of information systems, computer ethics, and collaboration using computers. Students will design and create databases. Not open to business majors or minors.

**CIS/IA 210. Introduction to Global Competitive Intelligence.** 3 credits.

This course will focus on the tools and methods for the analysis and interpretation of business data related to external competitors and internal performance management in a global environment. Students will develop skills in data retrieval, manipulation, analysis and interpretation. Not open to students pursuing a major or minor in CIS. Not open to any major in the COB other than International Business.

**CIS 221. Principles of Programming.** 3 credits.

Instruction and practical experience in writing computer programs using object oriented design and event driven logic. Projects will include the use of control structures (sequence, selection and iteration) as well as file and array processing logic. Students will be required to demonstrate competency in the design of object-oriented solutions and the implementation of event driven logic to solve real-world business problems. Not open to students who have taken CS 239.

**CIS 301. Operating Systems and Server Administration.** 1 credit.

This is a lab-based course that introduces the student to operating systems and server administration in a business environment. Students will learn the basic functions of an operating system through the hands-on use of Linux and Windows. Additionally, students will acquire hands-on server administration skills in order to better understand the operational and security demands of business applications. *Prerequisites for declared CIS minors: COB 204 and junior or senior standing. Prerequisite or corequisite for CIS majors: COB 300.*

**CIS 304. Enterprise Architecture.** 3 credits.

This course explores the analysis, design, implementation, evaluation and management of enterprise IT solutions. Emphasis will be placed on planning and modeling the enterprise. Topics include functional modeling, physical architecture design, security planning and recovery issues, project management, emerging technologies, and ethical, financial and global considerations. *Prerequisite or corequisite: COB 300 or admission to the CIS minor.*

**CIS 311. Analyzing Data in Organizations.** 3 credits.

This course provides an overview of how to work with databases and other data sources in order to access relevant information in a timely and user-friendly manner. It includes discussions of a variety of data representation types, including relational databases, XML documents, and cloud data. Students learn essential database concepts and gain practical experience in querying, reporting, and analyzing data. *Prerequisite: CIS 204 or equivalent knowledge (instructor permission is needed). Not open to CIS majors or minors.*

**CIS 312. Systems Planning and Analysis.** 3 credits.

Information systems couple both technical (hardware, software, database, telecom) and socio-organizational (business processes, ethics, knowledge, users, developers) subsystems to create rich and available information for the purpose of optimizing business decisions. This course covers the techniques and common tools employed for planning and analyzing these systems. Emphasis will be placed on the system development life cycle, planning and analysis tools, and professional business writing. *Prerequisite: CIS 204 or equivalent knowledge (instructor permission is needed). Not open to CIS majors or minors.*

**CIS/CS 320. Computing and Telecommunications Networks.** 3 credits.

This course focuses on the underlying principles of telecommunications and how these principles are deployed to provide efficient and secure networks for providing voice, data, and video services. Emphasis is placed on understanding basic routing, switching, and data aggregation techniques; information security strategies; and understanding how basic information systems applications utilize telecommunications services. *Prerequisite: Open to CIS majors and minors with corequisite of CIS 304. Open to ISAT majors with prerequisite of ISAT 252. Open to CS majors with prerequisite of CS 139 or CS 149.*

**CIS 330. Database Design and Application.** 3 credits.

A study of the tools and techniques of database analysis and design including the implementation of the design using common database management system models. Not open to students who have taken CS 474. *Prerequisite for CIS majors: CIS 221 with a "C" or better; prerequisite or corequisite: COB 300. Prerequisites for CIS minors: CIS 221 with a "C" or better and junior or senior standing.*

**CIS 331. Intermediate Computer Programming.** 3 credits.

Study of concepts and techniques used in structured programming for business applications including program specification, design, development, testing, implementation and documentation. Topics include report processing, file processing and updating, programming for batch and interactive environments, data validation, array processing and software engineering principles. *Prerequisites or corequisites for CIS majors and minors: CIS 330.*

**CIS 354. Advanced Visual Basic Programming.** 3 credits.

Advanced course in Visual Basic programming. Emphasis will be placed on Object-Oriented programming, sequential and random data files and error trapping. Other topics covered will include data access objects, client server, printing in VB and Crystal Reports. *Prerequisite: CIS 221 with a grade of "C" or better. Prerequisite or corequisite: CIS 330.*

**OM 360. Operations Management.** 3 credits.

An introduction to the operations function in business. Topics include facility design, job analysis and design, forecasting, production planning, quality management, inventory management, scheduling and project management. *Prerequisites: CIS/COB 291 and junior standing.*

**CIS 361. Computer Information Systems Internship.** 0 credits.

To enable students to gain valuable work experience in a CIS-related field. Requires 300 hours of approved computer information systems work experience. All work sites must be pre-approved. *Prerequisites: CIS major and COB 300.*

**CIS 366. Web Development.** 3 credits.

This course is an introduction to the development of Web pages and websites. The three major topics covered are HyperText Markup Language (HTML), the principles of design for websites and the use of a programming language for web development. *Prerequisites or corequisites for CIS majors: COB 300 and CIS 221 or equivalent with a grade of "C" or better. Prerequisites for declared CIS minors: CIS 221 or equivalent with a grade of "C" or better and junior or senior standing.*

**CIS/BSAN 393. Predictive Analytics and Data Mining.** 3 credits.

This course focuses on quantitative techniques and computer applications that allow the extraction of useful, previously unrecognized information from large data sets for predictive purposes. By effectively sifting through databases such as those generated by many businesses, data mining allows the analyst to recognize potentially important patterns and to target business opportunities. *Prerequisites: COB 291 or equivalent with a grade of "B-" or higher and junior or senior standing.*

**CIS 411. Computer Forensics for Business.** 3 credits.

Study of the tools and techniques required to analyze the current and past contents of computer data storage devices. The course will cover the structure and formats of storage devices and the techniques used to manage storage devices and data. It will also include securing of the data and preparation for legal presentation of evidence. Analysis will include the audits of computer activity and audits of operating system logs. *Prerequisites or corequisites: CIS 301 and junior or senior standing.*

**CIS 420. Computer-Based Networking.** 3 credits.

An introduction to computer-based networks that incorporates data, voice and video traffic between computer systems and users. Topics include the theory, design and operation of local area networks, wide area networks and private branch exchange systems. *Prerequisite: CIS 320.*

**CIS 424. Computer Security Management.** 3 credits.

Instruction and discussion in the design, development and implementation of a computer security program including legal and ethical considerations. *Prerequisites: CIS 221 and CIS 304.*

**CIS 428. Mobile Computing and Security.** 3 credits.

The development of mobile software applications using current environments and frameworks is the primary objective of the class. Several different development and programming environments and platforms will be included as will the actual deployment of the application to a wireless device. An important aspect of the class will be the security implications of deploying mobile devices. *Prerequisites: "C" or better grade in CIS 221 and CIS 331 as prerequisite or corequisite.*

**CIS 434. Information Technology Consulting.** 3 credits.

This course investigates the tools used by and skills necessary for information technology consultants. The class will use a team-oriented project approach. Teams will be assigned professional consulting firms as manager/mentors and will work with their manager/mentor firm to complete projects that cover each phase of the consulting life cycle. *Prerequisite: Permission of the instructor.*

**CIS 454. Systems Analysis and Design.** 3 credits.

An introduction to the techniques of systems analysis and design. Emphasizes concept of system life cycle and importance of users in system design. *Prerequisite: Declared CIS major or minor. Corequisite or prerequisite: CIS 330.*

**CIS 463. Business Intelligence.** 3 credits.

This course provides a comprehensive discussion of advanced database techniques, data warehousing, online analytical processing (OLAP), data mining, data visualization, decision support systems (DSS), artificial intelligence (AI) methods and other business intelligence (BI) topics. Students gain practical experience using contemporary BI tools and technologies, and apply sound design principles for creating intelligent solutions to realistic business problems. *Prerequisite: Grade of "C" or better in CIS 330.*

**CIS 464. Information Systems Project Management.** 3 credits.

Students will develop knowledge and expertise applying techniques and tools used by systems analysts and project managers to plan and manage information systems implementations. *Prerequisites or corequisites for CIS majors: COB 300 and CIS 221 or equivalent with a grade of "C" or better. Prerequisite for declared CIS minors: CIS 221 or equivalent with a grade of "C" or better and junior standing.*

**CIS 466. Advanced Web Development.** 3 credits.

This course provides students with understanding and practical experience in server-side programming issues for Web-enabled database and e-commerce application development. Principal topics include receiving and responding to requests from browsers, connecting to database servers via middleware software, and scripting business rules and application logic on a Web server. E-commerce business issues, security implementations and object-oriented design are also covered. *Prerequisites: CIS 366 and CIS 330 or permission of the instructor.*

**CIS 484. Information Systems Development and Implementation.** 3 credits.

Comprehensive development and implementation of enterprise-level systems using object-oriented methodologies, database driven architectures, systems analysis and design procedures, and project management skills. Topics covered will include advanced programming techniques, database processing, GUI design, object communication and a comprehensive group capstone project. *Prerequisites: CIS 331 with a grade of "C" or better and CIS 330 with a grade of "C" or better. Corequisite: CIS 454.*

**CIS/BSAN 490. Special Studies in Computer Information Systems or Business Analytics.** 1-3 credits.

An advanced course in information and/or business analytics designed to give qualified students an opportunity to complete independent study under faculty supervision. *Prerequisites:* Senior standing, recommendation of the instructor and written approval of the department head prior to registration.

**CIS 498. Special Topics in Computer Information Systems.** 3 credits.

An advanced course designed to allow exploration of current topics in computer information systems. Course content will vary. See adviser for current content. *Prerequisite:* Permission of the instructor.

**CIS 499. Honors.** 6 credits.

Year course. See catalog section "Graduation with Honors."

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## Computer Science

### Department of Computer Science

**CS 110. Introduction to Computer Professionalism and Ethics.** 1 credit.

Seminar for first year students and transfer students focusing on professional and ethical issues in computer science. Topics include computer science degree requirements, the computer science profession, ethics of computing professionals, protection of software, Internet security and privacy issues, and current issues in computer science.

**CS 139. Programming Fundamentals (3, 2).** 4 credits.

Students learn fundamental problem-solving techniques using a modern programming language. This course covers the same material as CS 149, but at a slower pace for students with little or no programming experience. Students may not receive credit for both CS 139 and CS 149.

**CS 149. Programming Fundamentals (Accelerated).** 3 credits.

Students learn fundamental problem-solving techniques using a modern programming language. This course covers same material as CS 139, but at an accelerated pace for students with programming experience. Students may not receive credit for both CS 139 and CS 149. *Prerequisite:* A prior programming course or equivalent experience.

**CS 159. Advanced Programming.** 3 credits.

Students use advanced problem-solving strategies to develop algorithms using classes and objects and techniques such as recursion, exceptions and file I/O. This course also focuses on designing small applications and effective testing strategies. Students may not receive credit for both CS 159 and CS 239. *Prerequisite:* A grade of "C" or better in CS 139 or CS 149 or equivalent.

**CS/MATH 227-228. Discrete Structures I-II.** 3 credits each semester.

An introduction to discrete mathematical structures including functions, relations, sets, logic, matrices, elementary number theory, proof techniques, basics of counting, graphic theory, discrete probability, digital logic, finite state machines, integer and floating point representations. *Prerequisite for MATH/CS 227:* MATH 155, MATH 156 or sufficient score on the Mathematics Placement Exam. *Prerequisite for MATH/CS 228:* MATH/CS 227.

**CS 239. Advanced Computer Programming (3, 2).** 4 credits.

Students use various advanced problem-solving strategies to develop algorithms using classes and objects. Students also learn how to implement and use elementary data structures, including character strings, records, files, stacks and queues. *Prerequisite:* A grade of "C" or better in CS 139 or CS 149 or equivalent.

**CS 240. Algorithms and Data Structures.** 3 credits.

Students learn to implement and analyze elementary data structures and the basic complexity classes of algorithms that use strategies such as greedy algorithms, divide-and-conquer algorithms and backtracking algorithms. This analysis is especially applied to problems in searching, sorting and parsing. *Prerequisites:* Grades of "C-" or better in CS/MATH 227 and either CS 159 or CS 239.

**CS 252. Discrete Structures.** 3 credits.

Introduction to the mathematical structures used in computer science. Topics include logic and set theory, algebraic structures, automata theory and computability. *Prerequisite:* A grade of "C-" or better in CS 139 or CS 149.

**CS 260 Technical Communication for Computer Science.** 3 credits.

An introduction to the process of planning, researching, producing, and revising technical documents attuned to specific audiences in the computing industry. Document forms studied include definitions, correspondence, descriptions, specifications, instructions, proposals, reports, resumes, and plans.

**CS 274. Introduction to Databases.** 3 credits.

Students learn how to design and implement a normalized relational database. Emphasis is on the practical construction of an interactive database using graphical user interfaces and report generation.

**CS 280. Projects in Computer Science.** 1-3 credits.

Projects or topics in computer science which are of interest to the lower division student. May be repeated for credit when course content changes. Topics may vary. *Prerequisite:* Students should consult the instructor prior to enrolling for the course.

**CS/CIS 320. Computing and Telecommunications Networks.** 3 credits.

This course focuses on the underlying principles of telecommunications and how these principles are deployed to provide efficient and secure networks for providing voice, data and video services. Emphasis is placed on understanding basic routing, switching and data aggregation techniques, information security strategies, and understanding how basic information systems applications utilize telecommunications services. *Prerequisite:* Open to CIS majors and minors with corequisite of CIS 304. Open to ISAT majors with prerequisite of ISAT 252. Open to CS majors with prerequisite of CS 139 or CS 149.

**CS 330 Societal and Ethical Issues in Computing.** 3 credits.

Overview of philosophical and professional ethics, and a survey of societal and ethical issues in computing such as privacy, intellectual property, computer security, computer crime, product liability, and the societal, environmental, and economic impact of computers. Students develop skills in assuming and defending positions on societal and ethical issues through oral presentations and written reports.

**CS 340. Assembly Language Programming.** 3 credits.

Principles of assembly language programming. Assembly language contrasted with machine language. Assembly directives, conditional assembly and macros. Design of a two-pass assembler. The material in this course is useful for those interested in machine design, operating systems, embedded computer systems and microcontrollers, and other areas which require low-level knowledge of computer operation. *Prerequisite:* A grade of "C" or better in CS 139 or CS 149.

**CS/ISAT 344. Intelligent Systems.** 3 credits.

In-depth introduction to current and future intelligent systems, including expert systems, neural networks, hybrid intelligent systems, and other intelligent system technologies and their development, uses and limitations. *Prerequisite:* CS 239, CS 159 or ISAT 340.

**CS/ISAT 345. Software Engineering.** 3 credits.

Study of means for the development and maintenance of high quality software products delivered on time and within budget. Topics include requirements analysis and specification, software design, implementation, testing, maintenance, project management, ethics and the responsibilities of software engineering professionals. *Prerequisites:* CS 139, CS 149 or ISAT 340 with sophomore standing in the ISAT major.

**CS 347. Web-Based Information Systems.** 3 credits.

This course covers the design and development of applications intended for deployment over the World Wide Web. Students will examine Web protocols, the architecture of Web-based applications, the languages and facilities with which they are developed, and related issues such as security and reliability. Students will also work in teams using a representative suite of development tools and languages to design and construct a simple client/server application that includes a GUI and a database interface. *Prerequisites:* Grades of "C-" or better in CS 345 and either CS 159 or CS 239.

**CS 349. Developing Interactive Multimedia.** 3 credits.

Students learn the concepts of multimedia, the issues in designing multimedia to interact effectively with users, the performance and speed issues in designing multimedia, and how to implement interactive multimedia applications. *Prerequisite:* A grade of "C-" or better in CS 240.

**CS 350. Computer Organization.** 3 credits.

Students learn how a computer works by examining hierarchical computer organization, data representation, instruction set architectures, addressing techniques, interrupt handling, and digital hardware design. Emphasis is placed on the interface between hardware and software, as well as the development of low-level software. *Prerequisites:* Grades of "C-" or better in CS/MATH 227 and CS 159 or CS 239.

**CS 354 Introduction to Autonomous Robotics.** 3 credits.

A hands-on introduction to programming autonomous mobile robots. The focus of this course is on designing robotic systems that navigate independently in complex environments. Specific topics include localization, mapping, kinematics, path planning and computer vision. *Prerequisite:* A grade of "C-" or better in CS 240.