# COMPUTER INFORMATION SYSTEMS (CIS)

#### CIS 101 COMPUTER FUNDAMENTALS

#### 3, 3/0

Basic computer literacy. The computer and its components. Hands-on experience in creating business productivity products, such as word processing, spreadsheets, databases, and presentation documents. Relevant application software examined. The Internet, its impact on society, and use as a communication and research tool. Investigation of future trends and emerging technologies. Offered every semester.

### CIS 105 INFORMATION TECHNOLOGY AND SOCIETY 3, 3 / 0

The impact of information technology (IT) on social, ethical, legal, economic, privacy, intellectual property, and personal issues. Contemporary issues and challenges as affected by historical IT developments (Internet, databases, networks, communications, etc.) Students use current technology to support investigations of related topics and to communicate findings. Offered every semester.

#### CIS 121 INTRODUCTION TO CODING 3, 3/0; MQ23

Introduction to various topics of computer science and to develop in students the computational thinking practices of problem solving and coding within the context of problems that are relevant to the lives of today's students. Students will be exposed to programming basics using block-based graphical environment, website design, and app programming for mobile devices. Offered every semester.

### CIS 151 COMPUTER PROGRAMMING I 3, 3/0

Overview of computers and programming languages. Introduction to basic programming concepts, skills, tools, and principles of good practice. Design, develop, and execute programs using a modern programming language such as Python. Structured programming approach is utilized. Implementation of basic list and string data structures. Offered every semester.

CIS 189 TOPIC COURSE I 3, 0/0

Topics in Computer Information Systems.

CIS 190 TOPIC COURSE II

3, 3/0

#### CIS 251 COMPUTER PROGRAMMING II 3, 3/0

Prerequisite: CIS 151. Introduction of advanced programming concepts, methods, and tools, such as objects, list and string manipulation, exception handling, lambda expressions, file I/O, complex data structures. Both procedural and object-oriented programming approaches examined and utilized.Offered every semester.

#### CIS 315 COMPUTER ORGANIZATION

#### 3, 3/0

Prerequisite: CIS 151. Introduce the organization and function of various components in a computer system. Covered topics including data representation, digital logic circuits, the CPU, memory, bus, instruction set architecture, machine and assembly languages, and parallel processing; discuss the interaction of system components; analyze computing performance issues. Offered every semester.

#### CIS 361 FUNDAMENTAL CONCEPTS IN OBJECT-ORIENTED PROGRAMMING

#### 3, 3/0

Prerequisite: CIS 151. An introduction to object-oriented programming. Introduces transfer students who have had the equivalent programming experience in a proceduraloriented environment to the paradigms of the object-oriented environment. Required for CIS majors who have no previous experience with object-oriented programming. Offered fall only.

#### CIS 370 SYSTEMS ANALYSIS AND DESIGN 3, 3/0; IN23, RE23

Prerequisite: CIS 151. Introduction to information systems analysis and design, including concepts, approaches, methods, models, and tools and their application to various types of business and industry information system problems and challenges. Systems development life cycle is explored. Offered every semester.

#### CIS 375 WEB DESIGN AND PROGRAMMING I 3, 3/0

Prerequisite: CIS 251. Examine foundational web technologies, particularly HTML, CSS, and JavaScript. Create and implement structured web pages, style content, and interactive elements, preparing students for more advanced web development topics. Offered every semester.

#### CIS 380 DATABASE SYSTEMS I

3, 3/0

Prerequisite: CIS 151, CIS 370. An introduction to database systems, including spreadsheets, database uses and applications, data manipulation, sorting and indexing, functions of database systems, basic concepts of relational databases, and SQL programming. Offered every semester.

### CIS 388 SERVICE LEARNING IN COMPUTING 3, 1/0

Prerequisites: CIS 151 or Instructor Permission. Students will participate in organized service-learning activities, offering coding/programming workshops for middle and high school students to address community needs. Students will enhance their academic knowledge and skills in a variety of areas of computer programming, develop technical communication skills, and foster their civic responsibility. Offered in fall and spring semesters.

CIS 389 TOPIC COURSE

3,0/0

Topics in Computer Information Systems.

# CIS 391 INFORMATION TECHNOLOGY PROJECT MANAGEMENT

3, 3/0

Prerequisite: CIS 370. Current practices in IT project management as applied to information systems projects. Hands-on experience with tools and techniques required in different phases of an information system project's life cycle, including project planning, staffing and organization, task scheduling, scope management, budgeting, and progress reporting. Considerations for agile/adaptive environments. Offered occasionally.

### CIS 400 .NET APPLICATION DEVELOPMENT 3, 3/0

Prerequisite: CIS 251 or CIS 361. Introduction to the .NET integrated development environment (IDE). Application project development using graphics user interface forms, event driven programming, procedural and object-oriented paradigms, and fundamental data structures. Applications will access data from forms, files, and databases. Offered every semester.

# CIS 410 COMPUTER OPERATING SYSTEMS 3, 3/0

Prerequisite: CIS 251 or CIS 361, CIS 315. A study of computer operating systems, their functions, components, scheduling and execution of jobs, task management, and interrupts. A comparison and exploration of contemporary operating systems is incorporated. Offered every semester.

CIS 411 DATABASE SYSTEMS II

#### 3, 3/0; IN23

Prerequisite: CIS 370. Advanced concepts and uses of database management systems. Topics include data definition language (DDL), data query language (DQL), data manipulation language (DML), data normalization, and database management system principles. Components of relational database will be presented along with SQL programming. Offered every semester.

### CIS 413 MULTIMEDIA WEB PROGRAMMING 3, 3/0

Prerequisites: CIS 251 or CIS 361, CIS 375. Integration of text, graphics, animation, and audio and video sources to create multimedia products deliverable via the World Wide Web. Programming with animation, data processing, dynamic content creation, and component manipulation. Emphasizes object-oriented capabilities of contemporary multimedia development tools, objects, methods, events, properties, and functions. Offered spring only.

# CIS 414 MULTIMEDIA METHODS, TOOLS, PROGRAMMING, AND APPLICATIONS 3, 3/0

Prerequisite: CIS 151. Various media related to the needs of CIS professionals in business and industry are examined, including digital images, video, audio, animation, and multimedia. The course includes methods and tools in the design, development, and programming of a range of digital multimedia products for a variety of professional purposes. Offered in fall semester.

### CIS 415 MULTIMEDIA AND USER INTERFACE DESIGN 3, 3/0

Prerequisite: CIS 151. Principles, processes, and tools for designing and developing digital multimedia for computerbased applications explored. User interface design principles (including visual, gestalt, and layout design principles) plus processes, features, and special considerations for a variety of digital products, applications, and platforms considered and applied. Offered occasionally.

### CIS 420 DATABASE MANAGEMENT SYSTEMS 3, 3/0

Prerequisite: CIS 411. Advanced concepts of database management, including data modeling, features and uses of database management systems, data and database administration, and data dictionary. Offered spring only.

### CIS 425 OBJECT-ORIENTED DEVELOPMENT 3, 3/0

Prerequisites: CIS 251. Object-oriented approach to programming and design, including its rationale. Topics include objects, encapsulation, information hiding, data and methods, access modifiers, exception handling, and inheritance. Students gain hands-on programming experience using an appropriate object-oriented language such as Java. Offered fall only.

# CIS 427 E-COMMERCE SYSTEMS AND TECHNOLOGIES

#### 3, 3/0

Prerequisites: CIS 370, CIS 375. Examines technological advancements along with business and organizational issues of electronic commerce. The technological context includes an understanding of tools and concepts such as Web servers, client/servers, communication networks, and e-commerce software. The business context includes components such as payment methods, fulfillment policies, privacy, security, and international issues. Offered spring only.

#### CIS 435 COMPUTER SEMINAR

#### 3, 3/0

Prerequisite: Permission of instructor. Selected topics from subjects not covered in formal courses. Offered occasionally.

#### CIS 442 ADVANCED SYSTEMS APPLICATIONS 3, 3/0

Prerequisite: CIS 411. Information systems in complex organizations. Techniques of information systems analysis and design. Detailed study of a representative real-world information system. Case studies, group work, and oral presentations. Offered occasionally.

#### CIS 461 PROGRAMMING WITH PYTHON 3, 3/0

Prerequisite: CIS 251 or CIS 361. This course will introduce students to a general-purpose, high-level programming language called Python whose design philosophy emphasizes code-readability. This course will examine Python as multiparadigm language which can be used to develop specific purpose software. Students will develop and present a research project using Python. Offered in fall semester.

#### CIS 470 DATA COMMUNICATIONS 3, 3/0

Prerequisites: CIS 315. Focuses on computer communication networks. Fundamental concepts in the design and implementation of networks, their protocols, and applications. Topics include: overview of network architectures, applications, network programming interfaces, transport, congestion, routing (topologies), data link protocols, and addressing. Offered occasionally.

# CIS 471 NETWORKING LABORATORY I 3, 3/0

Prerequisites: CIS 410, CIS 470. Hands-on experience in installing, configuring, and administering a modern operating system in a networked environment. Fundamental building blocks of a computer network, including hardware, topologies, protocols, and the OSI model. Related concepts such as TCP/ IP, Ethernet, network architecture, segmentation, virtual networks, performance optimization, and trouble shooting. Offered occasionally.

#### CIS 473 IT TECHNICAL SUPPORT 3, 3/0

Prerequisites: CIS 410. Various concepts, skills, and tools related to the needs of CIS professionals working in IT technical support, including computer components, assembly, and testing; motherboard components and functions; power supplies; data storage devices; expansion cards; network components, assembly, and testing; computer problems and troubleshooting; help desk skills and procedures. Offered occasionally.

#### CIS 475 WEB DESIGN AND PROGRAMMING II 3, 3/0

Prerequisites: CIS 375, CIS 411. Application of HTML5 and the latest technologies to create dynamic interactive web sites. Topics include creation of web pages using PHP to display dynamic content, file system I/O, creation of MySQL databases, populating the database using SQL statements via PHP, and displaying the database on a web page. Offered occasionally.

#### CIS 478 CYBERSECURITY 3, 3/0

Prerequisites: CIS 410, CIS 470. Apply relevant concepts and theories in the areas of computer/information security to the real world. Major topics include computer ethics, threat management, cybersecurity resources, endpoint security, cryptography, network security, and enterprise security. Offered occasionally.

#### CIS 480 INTRODUCTION TO ARTIFICIAL INTELLIGENCE

#### 3, 3/0

Prerequisite: CIS 251. Provide a comprehensive understanding of fundamental concepts, techniques, algorithms, and applications of artificial intelligence. Serves as a gateway to the AI domain. Topics range from the theoretical foundations to practical implementations, including search, regression, classification, deep learning, natural language processing, computer vision, and robotics. Offered occasionally.

#### CIS 488 INTERNSHIP

3, 1/0

Prerequisites: CIS 251, CIS 370, Junior or Senior status, Instructor permission. Guided, supervised field experiences working as trainees, on special projects or studies, and/or in a relevant aspect of information systems in functioning organizations. Qualified, upper-level students should have at least a 2.5 GPA, a relevant background of courses, and approval from the CIS internship coordinator (or department chairperson). Offered every semester.

CIS 490 SENIOR SEMINAR

3, 3/0

Capstone Course.

# CIS 494 UNDERGRADUATE RESEARCH IN COMPUTING

3, 3/0

Prerequisites: CIS Major or Minor, Upper Division status, Instructor Permission. Introduces students to various aspects of academic and applied research in the areas of Information Technologies, Computer Information Systems and related fields. Conduct in-depth research on topic of choice with instructor permission. Possible topics include, but are not limited to, programming methodology and applications, algorithms, advanced databases and distributed systems, networking, security, data analysis and related areas. Offered spring only.

CIS 495 SPECIAL PROJECT 1-3, 0/0

CIS 497 SPECIAL WORKSHOP

3, 0/0

Special workshop in Computer Information Systems.

CIS 499 INDEPENDENT STUDY 3-12, 0/0