

Descriptions for CIS Classes (Fall 2017)

Major Core Courses

1. CIS 1015. INTRODUCTION TO COMPUTER INFORMATION SYSTEMS. (3-3-0). This course provides students an introductory overview to basic computer concepts in hardware, software, networking, security, programming, database, mobile applications, decision support systems, and other contemporary and emerging technologies. Through the use of widely used applications and development environments, this course further explores their integration, application and impact on business and society. This course further explores the different roles in Computer Information Systems and the applicable tools and techniques required in each to help students identify a particular discipline they may desire to pursue based on their given skillset.
2. CIS 1030. INTRODUCTION TO SOFTWARE DEVELOPMENT. (3-3-0). An introduction to software development to include: an introduction to database and file concepts; an introduction to techniques and methods used in making decisions with data; and introduction to visual and object-oriented programming and design concepts. Pre- or Co-requisite: CIS 1015.
3. CIS 2050. ESSENTIALS OF NETWORK DESIGN AND OPERATION. (3-3-0). This course covers fundamentals of computer technology, installation, and configuration of PCs, laptops and related hardware and networking basics. Skills will be covered in installation and configuration of PC operating systems as well as configuring common features (e.g. network connectivity) for mobile OS Android & Apple OS. The final examination will be the PC PRO certification exam, a comparable certification to the CompTIA A+ examination. Students passing the PC PRO should be capable of passing the CompTIA A+.
4. CIS 2980. DATABASE SYSTEMS. (3-3-0). Study of the design, implementation, and management of database systems in a business environment. Topics include data modeling, normalization, SQL, and the utilization of a relational database management system to develop an integrated database application. Prerequisite: CIS 1015 or consent of instructor.
5. CIS 3020. WEB PAGE DEVELOPMENT. (3-3-0). This course provides a fundamental understanding of the tools, skills, and general design concepts required to develop web pages. Students will develop and implement web pages, modify images and create website navigation systems. Prerequisite: CIS 1030 or consent of instructor.
6. CIS 3900. SYSTEMS ANALYSIS AND DEVELOPMENT. (3-3-0). A project-oriented study of the planning, analysis, design and implementation of business software systems. Prototyping and object-oriented analysis and design methodologies will be covered. Unified Modeling Language (UML) will be covered. Emphasis is on both data modeling and object modeling. Prerequisite: CIS 2980.
7. CIS 4600. ADVANCED SYSTEMS DEVELOPMENT. (3-3-0). A capstone, project-oriented study of the planning, analysis, design and implementation of a business system using model-based software tools and other development platforms. Much attention is given to communication and teaming skills. Student teams will be given a user-request for development. Deliverables include: 1) user interviews, 2) project plan, 3) feasibility study and cost-benefit analysis, 4) business model, 5) interface design, 6) database design, 7) program design and 8) program functionality of a sub-system. A final project presentation by each student team will be required. Prerequisites: CIS 3900

Application Development Concentration

1. CIS 3300. INTERMEDIATE OBJECT-ORIENTED PROGRAMMING. (3-3-0). An intermediate course in object-oriented programming using the Java programming language. The course explores the basic constructs and syntax of the language, including data types, control statements, methods, arrays, classes, and objects. Students will develop programs to solve a variety of problems in math, science, business, and gaming. Students will perform laboratory-based activities to demonstrate programming proficiency. Prerequisite: CIS 1030.
2. CIS 3970. SECURE PROGRAMMING PRINCIPLES. (3-3-0). This course introduces principles and practices of secure programming: the writing of safe programs by identifying and avoiding common pitfalls, bugs, and vulnerabilities exploitable by attackers. This includes learning security principles, strategies, coding techniques, tools, and testing and auditing practices, that increases a program's resistance to attacks. The student will learn and apply secure programming concepts through lectures, demonstrations, and discussions with a focus on hands-on lab practical exercises including individual assignments and paired-programming group activities. Prerequisite: CIS 3300.
3. CIS 4000. ADVANCED DATABASE SYSTEMS. (3-3-0). Advanced topics and techniques of database system technology. Students will design and implement software components integral to database systems using a modern enterprise database management system (DBMS). Prerequisite: 2980.
4. CIS 4020. ADVANCED OBJECT-ORIENTED PROGRAMMING. (3-3-0). Advanced programming techniques in object-oriented programming, including recursion, searching, sorting, and implementation of abstract data types and data structures including arrays, records, linear lists, stacks, queues, trees, tables, graphs, etc. This course emphasizes problem solving skills in math, science, business, and information systems. Prerequisites: CIS 3300.
5. CIS 4030. WEB APPLICATIONS: CLIENT-SIDE DEVELOPMENT. (3-3-0). This course introduces the student to design and development issues associated with client side functionality in web based systems. Students will develop and implement web pages incorporating techniques that address web page structure and content, user interaction, and web site navigation. These pages will incorporate client side functionality using DHTML, JavaScript programming with client-side objects, and Cascading Style Sheets. Prerequisites: CIS 1030 and CIS 3020.
6. CIS 4060. MOBILE APPLICATIONS DEVELOPMENT. (3-3-0). This course provides an in-depth study of mobile application development techniques to include but not limited to planning, design, development, and deployment of a working application. Students will work with industry leading mobile platforms. Prerequisite: CIS 3300.
7. 1 Elective From:
 - * CIS 2020. INTRODUCTION TO PROGRAMMING.
 - * CIS 2100. SOFTWARE DEVELOPMENT.
 - * CIS 3000. INTERMEDIATE APPLICATION DEVELOPMENT.
 - * CIS 3400. TELECOMMUNICATIONS AND NETWORKS.
 - * CIS 3410. CERTIFIED ETHICAL HACKING.

- * CIS 3700. INTRODUCTION TO SERVERS.
- * CIS 3980. INTRODUCTION TO INFORMATION SECURITY.
- * CIS 4040. CYBER FORENSICS.
- * CIS 4070. DATA ANALYTICS.
- * CIS 4080. CLOUD COMPUTING.
- * CIS 4100. WEB APPLICATIONS: SERVER-SIDE DEVELOPMENT.
- * CIS 4200. TOPICS IN INFORMATION SYSTEMS DEVELOPMENT.
- * CIS 4220. NETWORK IMPLEMENTATION AND ADMINISTRATION.
- * CIS 4300. COLLABORATIVE FIELD PROJECT.
- * CIS 4400. TOPICS IN E-COMMERCE.
- * CIS 4700. TOPICS IN INFORMATION TECHNOLOGY HARDWARE AND SOFTWARE.

Networking and Systems Management Concentration

1. CIS 3400. TELECOMMUNICATIONS AND NETWORKS. (3-3-0). An in-depth course exploring the fundamental building blocks that form a modern network, such as protocols, topologies, hardware, and network operating systems. The course provides coverage of the most important concepts in contemporary networking, such as TCP/IP, Ethernet, wireless transmission, and security. The course will prepare students to select the best network design, hardware, and software for their environment, as well as maintain, up-grade, and troubleshoot an existing network. A certification examination will be required as a part of the course assignments. The student does not have to pass the certification exam to pass the course. Prerequisites: CIS 2050 or consent of instructor.
2. CIS 3410. CERTIFIED ETHICAL HACKING. (3-3-0). In order to protect a network against a hacker, one must learn to think like one. Through penetration testing, vulnerabilities in a system can be discovered and corrected. This course will explore ways a hacker can gain access to computer resources. It will investigate weaknesses in operating systems, databases, coding, and networks. When possible, we will actively perform various attacks on pre-staged systems. This course will focus on the ethics involved in performing a penetration test. Finally, we will explore methods to prevent or mitigate vulnerabilities. Prerequisite: CIS 3400
3. CIS 3700. INTRODUCTION TO SERVERS. (3-3-0). This course helps a student develop a fundamental understanding of the skills needed to setup and maintain a basic Windows or Linux server, focusing on the newest version available at the time of the course. Through discussion and hands-on activities, students gain the skills required to take the nationally recognized CompTIA Server+ certification exam. Prerequisite: CIS 3400.
4. CIS 3980. INTRODUCTION TO INFORMATION SECURITY. (3-3-0). This course provides an overview of Information Security. It is designed to provide students with practical knowledge about

important issues in Information Security from both the technical and administrative viewpoint, with an emphasis on the managerial implications. The course examines the significance of security in today's information systems; the potential threats to the information security; the various technical tools people use to enhance information security; and the managerial and legal implications of information security. A certification examination will be required as a part of the course assignments. The student does not have to pass the certification exam to pass the course. Prerequisites: CIS 2050 or consent of the instructor.

5. CIS 4080. CLOUD COMPUTING. (3-3-0). This course provides a hands-on introductory study of Cloud concepts and capabilities across the various Cloud service models including Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). This course will familiarize students with the use of applications and processes available on the Cloud on a metered on-demand basis in multi-tenant environments, as well as the Cloud security model and associated challenges. Through hands-on assignments and projects, students will learn how to configure and program the various services and understand how to develop and integrate Cloud-based software applications and services built on Cloud platforms. Prerequisites: CIS 2980 and CIS 3400.

6. CIS 4220. NETWORK IMPLEMENTATION AND ADMINISTRATION. (3-3-0). A study of network implementation and administration in an enterprise. A certification examination will be required as a part of the course assignments. The student does not have to pass the certification exam to pass the course. Prerequisite: CIS 3400.

7. 1 Elective From:

- * CIS 2020. INTRODUCTION TO PROGRAMMING.
- * CIS 2100. SOFTWARE DEVELOPMENT.
- * CIS 3000. INTERMEDIATE APPLICATION DEVELOPMENT.
- * CIS 3300. INTERMEDIATE OBJECT-ORIENTED PROGRAMMING.
- * CIS 3970. SECURE PROGRAMMING PRINCIPLES.
- * CIS 4000. ADVANCED DATABASE SYSTEMS.
- * CIS 4020. ADVANCED OBJECT-ORIENTED PROGRAMMING.
- * CIS 4030. WEB APPLICATIONS: CLIENT-SIDE DEVELOPMENT.
- * CIS 4040. CYBER FORENSICS.
- * CIS 4060. MOBILE APPLICATIONS DEVELOPMENT.
- * CIS 4070. DATA ANALYTICS.
- * CIS 4100. WEB APPLICATIONS: SERVER-SIDE DEVELOPMENT.
- * CIS 4200. TOPICS IN INFORMATION SYSTEMS DEVELOPMENT.
- * CIS 4300. COLLABORATIVE FIELD PROJECT.

* CIS 4400. TOPICS IN E-COMMERCE.

* CIS 4700. TOPICS IN INFORMATION TECHNOLOGY HARDWARE AND SOFTWARE.

Web Development Concentration

1. CIS 3300. INTERMEDIATE OBJECT-ORIENTED PROGRAMMING. (3-3-0). An intermediate course in object-oriented programming using the Java programming language. The course explores the basic constructs and syntax of the language, including data types, control statements, methods, arrays, classes, and objects. Students will develop programs to solve a variety of problems in math, science, business, and gaming. Students will perform laboratory-based activities to demonstrate programming proficiency. Prerequisite: CIS 1030.
2. CIS 3970. SECURE PROGRAMMING PRINCIPLES. (3-3-0). This course introduces principles and practices of secure programming: the writing of safe programs by identifying and avoiding common pitfalls, bugs, and vulnerabilities exploitable by attackers. This includes learning security principles, strategies, coding techniques, tools, and testing and auditing practices, that increases a program's resistance to attacks. The student will learn and apply secure programming concepts through lectures, demonstrations, and discussions with a focus on hands-on lab practical exercises including individual assignments and paired-programming group activities. Prerequisite: CIS 3300.
3. CIS 4000. ADVANCED DATABASE SYSTEMS. (3-3-0). Advanced topics and techniques of database system technology. Students will design and implement software components integral to database systems using a modern enterprise database management system (DBMS). Prerequisite: 2980.
4. CIS 4030. WEB APPLICATIONS: CLIENT-SIDE DEVELOPMENT. (3-3-0). This course introduces the student to design and development issues associated with client side functionality in web based systems. Students will develop and implement web pages incorporating techniques that address web page structure and content, user interaction, and web site navigation. These pages will incorporate client side functionality using DHTML, JavaScript programming with client-side objects, and Cascading Style Sheets. Prerequisites: CIS 1030 and CIS 3020.
5. CIS 4100. WEB APPLICATIONS: SERVER-SIDE DEVELOPMENT. (3-3-0). The course introduces the student to the issues and practices associated with the implementation and operation of multi-tier web-aware organizational applications and databases. Students will build an interactive, dynamic, data-driven web site utilizing the PHP server-side scripting language that will interface with a MySQL database for dynamic content. Security issues will be addressed through an understanding of issues and tools involving server-side design methodologies such as session handling and validation. Students will perform laboratory-based activities to demonstrate programming proficiency. Prerequisite: CIS 2980, CIS 3020, and CIS 3300.
6. CIS 4060. MOBILE APPLICATIONS DEVELOPMENT. (3-3-0). This course provides an in-depth study of mobile application development techniques to include but not limited to planning, design, development, and deployment of a working application. Students will work with industry leading mobile platforms. Prerequisite: CIS 3300.

7. 1 Elective From:

- * CIS 2020. INTRODUCTION TO PROGRAMMING.
- * CIS 2100. SOFTWARE DEVELOPMENT.
- * CIS 3000. INTERMEDIATE APPLICATION DEVELOPMENT.
- * CIS 3400. TELECOMMUNICATIONS AND NETWORKS.
- * CIS 3410. CERTIFIED ETHICAL HACKING.
- * CIS 3700. INTRODUCTION TO SERVERS.
- * CIS 3980. INTRODUCTION TO INFORMATION SECURITY.
- * CIS 4020. ADVANCED OBJECT-ORIENTED PROGRAMMING.
- * CIS 4040. CYBER FORENSICS.
- * CIS 4070. DATA ANALYTICS.
- * CIS 4080. CLOUD COMPUTING.
- * CIS 4200. TOPICS IN INFORMATION SYSTEMS DEVELOPMENT.
- * CIS 4220. NETWORK IMPLEMENTATION AND ADMINISTRATION.
- * CIS 4300. COLLABORATIVE FIELD PROJECT.
- * CIS 4400. TOPICS IN E-COMMERCE.
- * CIS 4700. TOPICS IN INFORMATION TECHNOLOGY HARDWARE AND SOFTWARE.

Core Programming Concentration

1. CIS 2020. INTRODUCTION TO PROGRAMMING. (3-3-0). An introduction to procedural programming using COBOL. Course delivery will be via an IBM enterprise server. Students will be introduced to Job Control Language (JCL). Students will analyze and program typical business-oriented problems using a modular and structured programming approach. Students will be introduced to data analysis via file structures and data fields. Prerequisite: CIS 1030
2. CIS 2100. SOFTWARE DEVELOPMENT. (3-3-0). Visual and event-driven programming using an Integrated Development Environment to design and implement programs of increasing complexity. Prerequisite: CIS 1030
3. CIS 3000. INTERMEDIATE APPLICATION DEVELOPMENT. (3-3-0). Continued procedural programming from CIS 2020 via an IBM enterprise server and Job Control Language (JCL). Students will design and implement assignments that include multi-file processing and multi-level table handling. The course emphasizes advanced problem situations such as file updates via transaction files, data validation, and multi-level control break reporting. Prerequisite: CIS 2020.

4. CIS 3300. INTERMEDIATE OBJECT-ORIENTED PROGRAMMING. (3-3-0). An intermediate course in object-oriented programming using the Java programming language. The course explores the basic constructs and syntax of the language, including data types, control statements, methods, arrays, classes, and objects. Students will develop programs to solve a variety of problems in math, science, business, and gaming. Students will perform laboratory-based activities to demonstrate programming proficiency. Prerequisite: CIS 1030.
5. CIS 3970. SECURE PROGRAMMING PRINCIPLES. (3-3-0). This course introduces principles and practices of secure programming: the writing of safe programs by identifying and avoiding common pitfalls, bugs, and vulnerabilities exploitable by attackers. This includes learning security principles, strategies, coding techniques, tools, and testing and auditing practices, that increases a program's resistance to attacks. The student will learn and apply secure programming concepts through lectures, demonstrations, and discussions with a focus on hands-on lab practical exercises including individual assignments and paired-programming group activities. Prerequisite: CIS 3300.
6. CIS 4020. ADVANCED OBJECT-ORIENTED PROGRAMMING. (3-3-0). Advanced programming techniques in object-oriented programming, including recursion, searching, sorting, and implementation of abstract data types and data structures including arrays, records, linear lists, stacks, queues, trees, tables, graphs, etc. This course emphasizes problem solving skills in math, science, business, and information systems. Prerequisites: CIS 3300.
7. CIS 4030. WEB APPLICATIONS: CLIENT-SIDE DEVELOPMENT. (3-3-0). This course introduces the student to design and development issues associated with client side functionality in web based systems. Students will develop and implement web pages incorporating techniques that address web page structure and content, user interaction, and web site navigation. These pages will incorporate client side functionality using DHTML, JavaScript programming with client-side objects, and Cascading Style Sheets. Prerequisites: CIS 1030 and CIS 3020.

Courses Not Required in Any Concentration

1. CIS 4040. CYBER FORENSICS. (3-3-0). This course provides an examination and analysis of advanced critical issues of computer crime. Emphasis will be placed on such advanced computer forensic science capabilities as target hardware and software, tools for data duplication, recovery, and analysis, and development of pre-search or on-scene computer investigative techniques. Prerequisite: CIS 2050 or consent of instructor.
2. CIS 4070. DATA ANALYTICS. (3-3-0). An introduction to the field of data analytics including the extensive use of data, statistical and quantitative analysis, exploratory and predictive models, and fact-based management to drive decisions and actions. Data analytics is explored as a process of transforming data into actions through analysis and insights in the context of organizational decision making and problem solving. This course stresses the factors that impact the performance of business decision makers and the data management and analysis methods that add value to them. The application of selected data mining techniques to business decision making situations is illustrated. Students actively participate in the delivery of this course through case and project presentations. Prerequisites: BUAD2120 and CIS 2980. BUAD3120 is recommended.