School of Natural and Social Sciences

Dean, Robert T. Kasper

Department of Computer Science

Department Chair, James P. Skon

Faculty
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Program Objectives

The courses and curriculum of the computer science program are designed to achieve the following student outcomes:

- exhibit a fundamental knowledge of the origins of computing, the capabilities and limitations of computing, and the use of computer technology as a tool for problem solving;
- demonstrate problem solving and communication skills fundamental to a liberal arts education and the computing profession;
- demonstrate an awareness of computer technology's impact on society, and engage in responsible actions when developing and using computing systems;
- develop practical, usable skills for employment in computer related professions as well as a foundation in computer science concepts as a basis for professional growth and further academic studies; and
- transition effectively into computing professions, exhibiting a Christian world view and a commitment to life-long learning and service.

Computer Science (CSC)

CSC1013G Introduction to Computing [3]. An introduction to computer science, including history and terminology, common computer applications such as spreadsheet and database management systems, the role and impact of computing in society, and simple programming. Prerequisite: A grade of C- or better in MAT0093, or an ACT mathematics score of 19 or higher, or an SAT mathematics score of 500 or higher.

CSC1024G Computer Science I [4]. An introduction to computer science and programming using the C programming language. Topics include elementary data and control structures and fundamental concepts for good programming habits. A laboratory is included. Prerequisite: A grade of C- or better in MAT0093, or an ACT mathematics score of 19 or higher, or an SAT mathematics score of 500 or higher.

CSC/MAT1053 Elementary Discrete Mathematics [3]. An elementary study of discrete mathematics as it relates to computer science. Topics include functions, proof techniques, sets, algebra, summation, number systems, logic, Boolean algebra, probability, combinatorics, and graph theory. Prerequisite: A grade of C- or better in MAT1013, or a passing score on the Trigonometry Proficiency Examination.

CSC2024 Computer Science II [4]. A continuation of CSC1024, including advanced C++ features and an introduction to data structures. Special emphasis is given to structured, modular programming. Extensive programming projects are required. A laboratory is included. Prerequisite: CSC1024 and a grade of C- or better in MAT1013, or a passing score on the Trigonometry Proficiency Examination.

CSC2033 Data Structures and Algorithm Design [3]. A study of common data structures including lists, stacks, queves, trees, graphs and networks, algorithm design methods, and object-oriented design and implementation. Prerequisites: CSC1024, CSC2024, and CSC1053.

CSC3004 Introduction to Software Development [4]. An introductory course in software development. Concepts include software specifications and design, methodologies for software organization and development, user interfaces, file processing techniques, and software debugging, testing, and documentation. Prerequisite: CSC2033.

CSC/MIS3013 Computer Networks and Telecommunications [3]. A study of networking and telecommunication concepts, models, standards, and protocols. Special emphasis is given to advances in wireline and wireless networks, Ethernet, optical networks, broadband including DSL and cable, cellular networks, ATM networks, network security and management, grid computing, and the semantic web. Network management and administration is also discussed. Prerequisite: BIS/CSC2023 or CSC2024 with a grade of C- or above.

CSC/MIS3023 Management Information Systems [3]. A study of computerized information systems that support organizational mission, goals, and objectives. Concepts include the theories, principles, concepts, components and types of management information systems, networks and telecommunications, and the systems development process. The information systems profession and advances in technology used to support communication, collaboration, and discovery for organizations are also discussed. Prerequisite: CSC1024.

aCSC3024 Software Engineering [4]. A study of the planning, design, implementation, validation, and management of computer software. Participation in a major group project is required. Prerequisite: CSC3004.

aCSC3031 Database Management Systems Laboratory for Computer Science [1]. Project work in design and implementation of relational databases, and software applications that use databases. Co-requisite: CSC3032.

aCSC/MIS3032 Database Management Systems [2]. A study of database models, designs, organization, normalization, integrity, and distributed database systems. Prerequisites: CSC/MAT1053, and CSC2033 or MIS/CSC3023. Co-requisite: CSC3031 or MIS3031.

CSC3044 Operating Systems and Systems Programming [4]. A study of memory management, processor scheduling, concurrency, process communication, security, and other system software. Laboratory work in modifying an existing operating system is required. Prerequisite: CSC2033.

CSC3054 Computer Organization and Architecture [4]. A study of computer system components, hardwired and micro-programmed control units, memory organization, and RISC architecture. Assembly language is covered. A laboratory is included. Prerequisite: CSC2033.

CSC3083 Technology and Society [3]. A study of technology's impact on individuals, groups, and institutions. Special emphasis is given to worker displacement, computer illiteracy, environmental and health issues, depersonalization, computer crime, intellectual property, invasion of privacy and other ethical/legal issues. Prerequisite: junior standing.

CSC/BIS4003 Computer and Information Security [3]. An advanced study of computer and information security. Topics include threats, vulnerabilities, and associated response mechanisms used to protect an organization Hardware and software solutions are presented with security-related models, principles, and concepts for analyzing and implementing organizational security programs. Prerequisite: CSC/MIS3013.

aCSC4023 Survey and Organization of Programming Languages [3]. A study of language concepts including grammar, parse trees, binding, abstraction, semantics, scope rules, data types and control structures. Several languages are used in laboratory exercises. Prerequisite: CSC2033.

CSC4081 Computer Applications Practicum I [1]. The first part of an independent software development project selected in conjunction with the instructor. This portion includes the project planning, requirements specification, and design phases of a significant software system. Prerequisite: CSC3004 and senior standing, or instructor's permission.

CSC4082 Computer Applications Practicum II [2]. The second part of an independent software development project selected in conjunction with the instructor. This portion includes the project implementation, project test plan and testing, user management and programming documentation, and final presentation of the system. Prerequisite: CSC4081.

CSC4089 Special Topics in Computer Science [3]. Selected topics in computer science. The course may be repeated for credit as topics vary. Prerequisite: instructor's permission.

aCSC4093 Computer Networking [3]. A study of the fundamentals of data communications and computer networking. Special emphasis is given to data encoding and transmission methods, network architecture and protocols, network routing and internetworking, and new technologies. The OSI reference model is the basis of study. Prerequisite: CSC/MIS3013.

CSC5019 Independent Study [1-4].

CSC5029 Computer Science Internship [1-6]. A supervised experience performed in a professional environment representing a student's major discipline. Prerequisite: Senior standing and departmental application and approval.

CSC5091 Computer Science Honors Research Project [1-2]. A capstone research project within the major for honor students. It is supervised by a faculty mentor and evaluated by a committee of three faculty. The course is repeatable for up to four (4) hours of credit. Prerequisite: Approval of the application of Intent for Honors Research Project by the Honors Program Director.

Departmental Programs

Associate in Applied Science in Business Data Processing

Required Courses	
CSC1013G Introduction to Computing	3
CSC1024G Computer Science I	4
CSC2024 Computer Science II	4
CSC2033 Data Structures and Algorithm Design	3
Select one of the following:	3-4
CSC3004 Introduction to Software Development	
CSC/MIS3013 Computer Networks and Telecommunications	
CSC3054 Computer Organization and Architecture	
CSC3044 Operating Systems and Systems Programming	
ABT2013 Computer Applications in Business I	3
CSC/MIS3023 Management Information Systems	3
ECO1033G Principles of Macroeconomics	3
ACC2053 Principles of Accounting I	3
ACC2063 Principles of Accounting II	3
Total	32-33 Hours

Bachelor of Arts in Computer Science

Required Courses	
CSC1024G Computer Science I	4
CSC/MAT1053 Elementary Discrete Mathematics	3
CSC2024 Computer Science II	4
MAT1023G Precalculus Mathematics	3
CSC2033 Data Structures and Algorithm Design	3
CSC3004 Introduction to Software Development	4
CSC3024 Software Engineering	4
CSC3083 Technology and Society	3
CSC3054 Computer Organization and Architecture	4
CSC4081 Computer Applications Practicum I	1
CSC4082 Computer Applications Practicum II	2
CSC/MIS3013 Computer Networks and Telecommunications	3
CSC3031 Database Management Systems Lab	1
CSC/MIS3032 Database Management Systems	2
Elective Courses	
Computer science electives (at least 6 hours of the computer science electives must be courses numbered 3000 or above)	6
Total	47 Hours

The student with a major in computer science (Bachelor of Arts degree) must complete a minor in another discipline.

Bachelor of Science in Computer Science

(This program is based on the Association for Computing Machinery curriculum recommendations.)

Required Computer Science Courses	
CSC1024G Computer Science I	4
CSC2024 Computer Science II	4
CSC2033 Data Structures and Algorithm Design	3
CSC3004 Introduction to Software Development	4
CSC3024 Software Engineering	4
CSC3044 Operating Systems and Systems Programming	4
CSC4023 Survey and Organization of Programming Languages	3
CSC3083 Technology and Society	3
CSC/MIS3013 Computer Networks and Telecommunications	3
CSC4093Computer Networking	3
CSC4081 Computer Applications Practicum I	1
CSC4082 Computer Applications Practicum II	2
CSC3054 Computer Organization and Architecture	4
CSC3031 Database Management Systems Lab	1
CSC/MIS3032 Database Management Systems	2
Required Mathematics Courses	
CSC/MAT1053 Elementary Discrete Mathematics	3
MAT2063 Introduction to Statistics	3
MAT1034 Calculus I	4
MAT2034 Calculus II	4
MAT3013 Linear Algebra	3
MAT3023 Advanced Discrete Mathematics	3
Total	65 Hours

The student with a major in computer science (Bachelor of Science degree) must complete the mathematics minor that is included above.

Computer Science Minor

CSC1024 Computer Science I	4
CSC2024 Computer Science II	4
CSC/MAT1053 Elementary Discrete Mathematics	3
CSC2033 Data Structures and Algorithm Design	3
Select 4 or more hours from courses numbered 3000 and above:	4
Total	18 Hours