

COURSE CATALOG DESCRIPTION AND PREREQUISITS

Computer Science (CSCI)

CSCI 1100 -- Applied Computing (2-2-3)

This course covers applied topics in computing which will serve as tools for presentations, web development, and knowledge of basic operating systems. Topics include using PowerPoint, understanding and using email, remote file transfer and remote login using Secure Shell, building Websites using tools such as XHTML & Java Scripting, Windows basics, and Linux basics.

Prerequisite: MATH 1101 or higher (or equivalent placement score).

CSCI 1301 - Computer Science I (3-0-3)

The course includes an overview of computers and programming: problem-solving and algorithm development; simple data types; arithmetic and logical operators; selection structures; repetition structures; text files; arrays (one-and two-dimensional); procedural abstraction and software design; modular programming (including subprograms or the equivalent). A high level programming language will be used.

Prerequisite(s): A grade of C or better in MATH 1101 or higher (or equivalent placement score).

CSCI 1302 - Computer Science II (3-0-3)

The course covers abstract data types (ADTs); arrays (multi-dimensional), records; strings, and sets; binary files; searching and sorting; recursion; pointers and collections; software engineering concepts; A high level programming language will be used.

Prerequisite(s): A grade of C or better in CSCI 1100 and CSCI 1301.

CSCI 2302 - Data Structures and Algorithms (3-0-3)

This course is a systematic study of the main data structures of computer science: arrays, stacks, queues, linked lists, trees, graphs, hash tables. Implementation and analysis of the algorithms and programming techniques for searching, sorting, inserting into, and deleting from these structures; efficiency considerations.

Prerequisite: A grade of C or better in CSCI 1302, MATH 2020.

CSCI 2305- Computer Organization and Architecture (3-0-3)

This course is a study of the organization and architecture of computer systems, beginning with the standard von Neumann model to more recent architectural concepts. Topics include digital logic, data representation, assembly language, multiprocessor systems, and contemporary architectures.

Prerequisite: A grade of C or better in CSCI 1302

CSCI 3300 - Computer Ethics (3-0-3)

This course is a study of professional codes of ethics and the responsibilities that they place on technology professionals. Investigation of the background and implications of ethical concerns in the application of technology and the use of moral reasoning to comprehend issues of privacy, security, ownership, protection, and law.

Prerequisite: Junior or senior standing or permission of the department.

CSCI 3301 - Game Design & Programming I (3-0-3)

This course covers modern computer game design and programming techniques including real-time event-driven and multimedia programming techniques.

Prerequisite: A grade of C or better in CSCI 2302 and MATH 2140.

CSCI 3305 - Operating Systems (3-0-3)

This course is a conceptual and hands-on study of operating systems; operating system design and theory including process/processor, memory, file, I/O and networking management; evaluation of system requirements.

Prerequisite: A grade of C or better in CSCI 2302.

Co-requisite: MATH 2502.

CSCI 3306 – Computer Networks and Security I (3-0-3)

This course covers Network systems including transmission media, packet transmission, circuit / packet switching technology, LAN technology and network topology, TCP/IP, internetworking; Network applications and security issues are investigated.

An overview of LANs, WANs, data communication, and routing methods will be provided using software simulation tools.

Prerequisites: A grade of C or better in CSCI 2302 and CSCI 2305.

CSCI 3310 – Databases Design & Implementation (3-0-3)

This course covers database modeling drawing distinctions between data modeling, process modeling, and implementation. Topics include Entity-Relationship Modeling, Relational Database Modeling to include Relational Algebra and Normalization and Object Modeling and Object Databases.

Implementation topics include SQL, PL/SQL, and database access using Web interfaces.

Prerequisite: A grade of C or better in CSCI 2302, MATH 2020.

CSCI 3320 - Software Engineering Design (3-0-3)

This course covers analysis of system requirements, software systems design techniques, software processes, software life-cycle models, software economics, configuration management, user interfaces, software testing, and software maintenance. Students gain experience in the team approach to medium-scale system development. Ethical issues related to software design are discussed.

Prerequisites: A grade of C or better in CSCI 3310, CSCI 3306 MATH 1231

CSCI 3333 - Programming Languages (3-0-3)

This course covers the concepts of syntax and semantics of grammars and languages. It includes the study and comparison of the organization and major constructs of various programming language paradigms, with in-depth study of several specific languages. Language Implementation and compiler/interpreter-related issues are addressed.

Prerequisites: A grade of C or better in CSCI 2302, MATH 2020.

CSCI 4301 - Game Design & Programming II (3-0-3)

This course covers advanced techniques in game programming, including graphics game engines, motion generation, and issues in multi-user interaction.

Prerequisites: A grade of C or better in CSCI 3301, MATH 2502

CSCI 4304 – Computer Graphics (3-0-3)

This course is an introduction to computer graphics and graphics systems, including: graphics hardware, 2D rendering, 2D and 3D transformations, animation, illumination, and modeling. Additional topics include user interface and interactive inputs.

Prerequisites: A grade of C or better in CSCI 3301, MATH 2140, MATH 2502.

CSCI 4305 – Unix (Linux) Systems Programming & Administration

This course covers UNIX (Linux) and C/C++ standards, file I/O, file access and attributes, directories, the standard I/O library, systems administration files, the process environment, process

control, process relationships, signals, terminal I/O, daemon processes, interprocess communication, and pseudo terminals. Also included are relevant topics in Unix (Linux) system administration

Prerequisites: A grade of C or better in CSCI 3305

CSCI 4306 – Computer Networks and Security II (3-0-3)

This course covers the design and implementation of protocols and the vulnerabilities and risk associated with these implementations. Other topics include Cryptographic techniques and algorithms. Design and implementation of network routing protocols and security architecture will be done using software simulation tools.

Prerequisite: CSCI 3306

CSCI 4307 - Artificial Intelligence (3-0-3)

This course is an introduction to artificial intelligence and machine learning. Topics include intelligent system design methodologies, search and problem solving, supervised and reinforced learning.

Prerequisite: A grade of C or better in CSCI 2302, Math 2502

CSCI 4310 – Advanced Issues in Databases (3-0-3)

This course is an advanced in-depth study of indexing, security, query processing, transactions; introduction to data warehousing; parallel and distributed databases..

Prerequisites: A grade of C or better in CSCI 3310.

CSCI 4315 - Human Computer Interface (3-0-3)

This course covers design and interfacing of computer input and output systems. Standard (mouse, keyboard, joystick, etc.) and new (head trackers, music controllers, gloves, etc.) input devices. Output mediums will include graphics, music, and 3-D sound. Hands-on laboratories and independent projects will be required.

Prerequisite: A grade of C or better in CSCI 3320

CSCI 4316 – Cluster and Grid Computing (3-0-3)

This course covers the concepts of cluster and grid computing. Topics include communication, application, and management of technologies that make cluster and Grid computing possible.

Prerequisite: CSCI 3305

CSCI 4320 - Software Engineering Practicum (3-0-3)

This course covers software development methods for large-scale software systems, management of software development projects, and software engineering standards. Students are expected to complete a large-scale software project. This course is considered the capstone course. Ethical issues related to software development are discussed.

Prerequisite: A grade of C or better in CSCI 3300, 3320

CSCI 4333 - Theory of Computation (3-0-3)

This course is a study of the main areas of theoretical computer science and their hierarchical interconnections. Basic results relating to formal models of computation are studied, with emphasis on grammars and languages, finite automata, Turing machines, and computational complexity.

Prerequisites: A grade of C or better in CSCI 3333

CSCI 4334 - Algorithm Design and Analysis (3-0-3)

This course covers analysis of the complexity of algorithms, including sorting, searching, and graph algorithms; use and implementation of graphs.

Prerequisite: A grade of C or better in CSCI 3333

CSCI 4314 Multimedia Production and Development (3-0-3)

This course covers the acquisition, development and production of media elements such as graphics, animation, audio, video, virtual space and simulations. Students will integrate content with functional design criteria and organize the major and minor components of a multimedia production project.

Cross-listed with ITMM 4404

Prerequisites: (CSCI 2102, 2302) or (ITFN2012, 3314, 3134) and (ENGL 3900 or 3901)

CSCI 4360 – Computer Science Research (3-0-3)

This course is designed for students who want to carry out special research and investigations in CS at the senior level. Topic and method of procedure must have approval of the supervising faculty member.

Prerequisites: senior standing, at least 25 hours in computer science, permission of instructor and department.

CSCI 4370 - Internship in Computer Science (3-0-3)

This course involves the student working with business partners to develop meaningful projects which integrate and apply knowledge in an actual work environment. These projects will be presented to faculty, students and industry partners. Each student is expected to work for a minimum of 200 hours. Application must be made to Office of Experiential Learning and is subject to departmental approval.

Prerequisites: senior standing in computer science, approval of assignment by department

CSCI 4800 - Special Topics in Computer Science (Variable credit)

This course is designed to cover current topics of interest in Computer Science.

Prerequisite: permission of instructor and department.