COMPUTER SCIENCE (CSC)

CSC 100 The Beauty and Joy of Computing 3
A broad-based introduction to key concepts and principles of computer science. Exploration of seven big ideas of computing: creativity, abstraction, data, algorithms, programming, the Internet, and impact of computing.

CSC 101 Introduction to Computer Concepts 3
Introduction to computers and computing. Topics cover impact of computers on society, ethical issues, hardware, and software applications.

CSC 110 Computational Problem Solving 3
Using computing to apply mathematical concepts in developing algorithmic solutions to real-world problems, stressing analysis and logical reasoning. A modern programming language will be introduced for examples and assignments.

CSC 130 Introduction to Computer Science 3
Programming in a high-level language. Emphasis on problem analysis, problem-solving techniques, and software design principles and techniques.

CSC 200 Principles of Computing 3
A broad-based introduction to key concepts and principles of computer science. Exploration of seven big ideas of computing: creativity, abstraction, data, algorithms, programming, the Internet, and impact of computing.

CSC 230 Elementary Data Structures and Algorithms 3

CSC 250 Foundations of Computer Science I 3
An introduction to the fundamental ideas underlying contemporary computer science with a focus on the computation and construction of objects.

CSC 261 Computer Organization and Assembly Language 3
Introduction to the organization of the computer through the use of Assembly Language programming. Data representation, parts of the computer system, Assembly Language fundamentals, instruction sets, memory, and floating-point operations.

CSC 312 Ethics in Computer Science 1
Historical and social context of computing, ethical responsibilities of the computing professional, intellectual property rights, and risks and liabilities.

CSC 330 Advanced Data Structures 3

CSC 339 Concepts of Programming Languages 3
Concepts of block-structured, object-oriented, functional, logic, and concurrent programming languages. Comparative study of syntactic and semantic features of these languages and writing programs using them.

CSC 340 Software Engineering 3
Practical and theoretical concepts of software engineering.

CSC 345 Introduction to Database Systems 3
Introduction to database systems, focusing on the theoretical and practical aspects of database design, implementation, and management.

CSC 350 Foundations of Computer Science II 3
High level concepts in the theoretical foundations of computer science.

CSC 360 Object-Oriented Programming 3
Object-oriented programming concepts, design, and implementation.

CSC 361 Introduction to Computer Systems 3
An introduction to the components and operation of computer systems, including hardware, software, and networks.

CSC 370 Computer Networks 3
An introduction to the design, implementation, and management of computer networks.

CSC 393 Senior Project 3
Research in a topic of special interest at the Honors level.

CSC 463 Basic Systems Administration Laboratory 1
Automated installation, software installation, systems programming, backups, recompiling the kernel (loading/unloading modules), providing Web services, and user administration.

CSC 464 Intermediate Systems Administration Laboratory 1
Topics selected from routing, firewall, Primary Domain Controller, Backup Domain Controller, Domain Controller trust, SAMBA, DNS round robin, and PPP connectivity setup.

CSC 465 Advanced Systems Administration Laboratory 1
Installing operating systems, peripherals, hardware, and software. Projects will include departmental or university computer system work.

CSC 471 Principles of Database Systems 3
Contemporary database systems. Emphasis on query processing, design, and implementation of applications in relational (SQL) databases. Introduction to other database models such as XML, object-oriented, and deductive.

CSC 490 Senior Capstone 3
Application of classroom knowledge and skills in computer science to solve real-world problems and to develop research and development skills.

CSC 495 Selected Topics in Computer Science 3
A topic of special interest is studied in depth.

Notes: Computer Science majors only.
CSC 505 Data Science 3
Problem-based learning introduction to Data Science, including programming with data; data mining, munging, and wrangling; statistics, analytics, visualization; and applied machine learning, directed towards scientific, social, and environmental challenges.
Prerequisites: A grade of C or better in CSC 330 and (STA 271 or STA 290), or permission of instructor (prior programming and statistics experience is required).

CSC 510 Big Data and Machine Learning 3
Big data definitions and characteristics, computing environment for big data management and processing; machine learning models and algorithms, and scaling up machine learning (high dimensionality reduction).
Prerequisites: CSC 330. MAT 191; STA 271;
Corequisites: CSC 567. MAT 292.

CSC 523 Numerical Analysis and Computing 3
Number systems and errors, solutions of non-linear and linear systems, eigenvalue problems, interpolation and approximation, numerical differentiation and integration, solution of differential equations.
Prerequisites: Pr. grades of at least C (2.0) in CSC 130, CSC 350, and MAT 293, or permission of instructor.

CSC 524 Numerical Analysis and Computing 3
Continuation of CSC 523 with special topics in numerical analysis, emphasis on applied mathematics.
Prerequisites: Grade of at least C (2.0) in CSC 523.

CSC 526 Bioinformatics 3
Introduction to the problems and methods in Bioinformatics. Problem areas include restriction mapping, map assembly, sequencing, DNA arrays, and sequence comparison.
Prerequisites: Permission of instructor.

CSC 529 Artificial Intelligence 3
Logical foundations, knowledge representation and reasoning, search, and selected topics such as natural language processing and reasoning under uncertainty.
Prerequisites: Grade of at least C (2.0) in CSC 330 and CSC 350 or permission of instructor.

CSC 540 Human-Computer Interface Development 3
Survey of concepts and techniques for human-computer interface development. Topics include user-centered design, user interface programming, and usability evaluation.
Prerequisites: Grades of at least C (2.0) in CSC 340 or permission of instructor.

CSC 553 Theory of Computation 3
Finite state automata and regular expressions, context-free grammars, push-down automata and their use in parsing, overview of language translation systems, models for programming language semantics, computability and undecidability.
Prerequisites: Grade of at least C (2.0) in CSC 350. or permission of instructor.

CSC 555 Algorithm Analysis and Design 3
Sequential algorithm design and complexity analysis. Dynamic programming. Greedy algorithms. Graph algorithms. Selected advanced topics from NP-completeness; approximation, randomized, parallel, number-theoretic algorithms; Fast Fourier Transform; computational geometry; string matching.
Prerequisites: Grade of at least C (2.0) in CSC 330.
CSC 626 Advanced Bioinformatics 3
Advanced topics in bioinformatics related to sequence comparison and database search, fragment assembly of DNA, physical mapping of DNA, phylogenetic trees, genome rearrangements, and molecular structure prediction.
Prerequisites: CSC 526 or permission of instructor.

CSC 640 Software Engineering 3
Organization and scheduling of software engineering projects and structured software design. Specification methods, metrics, software engineering tools, design, prototyping, version control, and testing.
Prerequisites: CSC 330 or permission of instructor.

CSC 650 Language Theory 3
Important aspects of language theory. Advanced topics such as grammar, codes, L systems, and combinatorics on words.
Prerequisites: CSC 550 or permission of instructor.

CSC 653 Advanced Theory of Computation 3
Computability theory including Church-Turing thesis (Turing machines, variants, other models), decidability (decidable and undecidable problems for automata and grammars, the halting problem), reducibility (undecidability of mathematical truth).
Prerequisites: CSC 553, or permission of instructor.

CSC 655 Advanced Topics in Algorithms 3
Modern development of algorithm design and analysis for sequential and parallel computers; parallel, number-theoretic, probabilistic, and approximation algorithms, string matching, computational geometry, NP-completeness: worst-case versus average-case.
Prerequisites: Grade of at least C in CSC 555.

CSC 656 Foundations of Computer Science 3
Introduces the mathematical foundations that support advanced studies in computer science including computer programming and the analysis of algorithms.
Prerequisites: CSC 350 or permission of instructor.

CSC 663 Advanced Topics in Computer Systems 3
Prerequisites: CSC 330 and CSC 567 or CSC 561 or CSC 562 or permission of instructor.
Notes: May be repeated for credit when topics vary.

CSC 665 Advanced Wireless Networks 3
Wireless technology and architecture, wireless network types, wireless network design approaches, wireless application development and wireless network programming.
Prerequisites: CSC 330 or equivalent and one of the following: CSC 561 or CSC 562 or CSC 567 or permission of instructor.

CSC 671 Advanced Database Systems 3
Prerequisites: CSC 330 or permission of instructor.

CSC 672 Database System Architecture 3
File organization and indexing techniques. Query processing and optimization. Concurrency control and crash recovery. Distributed and heterogeneous database systems. Selected topics of current interest in database and knowledge-base systems.
Prerequisites: CSC 570 or CSC 671, or permission of instructor.

CSC 675 Principles of XML Databases 3
XML from a database point of view, concentrating on information retrieval (querying) and integration.
Prerequisites: CSC 671 or permission of instructor.

CSC 676 Topics in Database Systems 3
Selected topics of current interest such as: deductive databases, modeling and management of uncertain and inaccurate information, multi-database systems, data mining, on-line analytical processing and data warehousing.
Prerequisites: CSC 671 or permission of instructor.

CSC 680 Advanced Topics in Computer Security 3
Topics in cryptography and computer security, including cryptographic protocols, Web server security, Java security, security in the healthcare domain, and experimental quantum cryptography.
Prerequisites: CSC 339 and CSC 580.

CSC 683 Advanced Topics in Computer Science 3-6
Algorithms, architecture, languages, systems, theory, or other areas of computer science.
Prerequisites: Permission of instructor.
Notes: May be repeated once for credit.

CSC 695 Current Problems in Computer Science 3
Topics of current research interest in computer science.
Prerequisites: Permission of instructor.

CSC 697 Research Problems in Computer Science 3
Advanced research in specialized areas of computer science under the direction of a faculty member. Preparation for master's thesis.
Prerequisites: Permission of instructor.
Notes: Grade: Satisfactory/Unsatisfactory (S/U).

CSC 698 Project in Computer Science 3-6
Prerequisite: Permission of instructor;
Notes: May be repeated for up to 6 credit hours with permission of instructor. Grade: Satisfactory/Unsatisfactory (S/U).

CSC 699 Thesis 1-6
Advanced research in specialized areas of computer science under the direction of a faculty member. Preparation for master's thesis.
Prerequisites: Permission of instructor.
Notes: Grade: Satisfactory/Unsatisfactory (S/U).

CSC 711 Experimental Course 3
This number reserved for experimental courses. Refer to Course Schedule for current offerings.

CSC 801 Thesis Extension 1-3
CSC 803 Research Extension 1-3