

COMPUTER SCIENCE (CSC)

CSC 521 Database Principles and Design (3 Credits)

An introductory course emphasizing the basic concepts and principles of database systems. Topics include relational, hierarchical, and network approaches to data organization.

CSC 526 Structured Programming (3 Credits)

This is a one semester course that extensively covers programming concepts and techniques at an accelerated pace. Students learn how to develop, test, and debug programs on both Unix and Microsoft platforms. Topics covered include control structures, files, arrays, strings, classes and data abstractions, pointers, virtual functions, object-oriented concepts, linked lists, stacks, and queues.

CSC 530 Data Communication (3 Credits)

Focuses on the basic principles of computer communication as well as hardware and software designs. Topics include transmission media, data encoding, transmission techniques, protocols, switching networks, broadcast networks, and local area networks.

CSC 535 Computer Security I (3 Credits)

This course is designed for IT professionals to learn computer and network security theories and practices that can be used to significantly reduce the security vulnerability of computers on internal networks or the Internet. The course assumes some familiarity with various operating systems and computer networks. Topics include cryptography, program security, operating systems security, database security, network security, security administration, computer ethics, and legal issues.

CSC 555 Management of Information Security (3 Credits)

This course is designed for Security System Administrators and Managers responsible for the design, planning and management of security installations in business and government institutions. Topics include management of information security, security planning, security protection, best practices, risk management, operations security, legal issues and certification and accreditation. The course assumes some familiarity with various topics taught in an Introduction of Information Assurance course.

CSC 564 Operating Systems (3 Credits)

Topics include the history and evolution of operating systems, the concepts behind and structure of various operating systems, process scheduling, interprocess communication, input and output, multiprogramming, memory management, and file systems. Concepts of distributed operating systems are also introduced.

CSC 566 Advanced Computer Topics I (3 Credits)

Advanced computer topics not generally covered in the curriculum. Designed as a Computer Science elective – not as a replacement for any specific required course.

CSC 567 Advanced Computer Topics III (3 Credits)

Advanced computer topics not generally covered in the curriculum. Designed as a computer science elective – not as a replacement for any specific required course.

CSC 570 Artificial Intelligence (3 Credits)

In depth study of concepts and problem solving techniques of artificial intelligence. Topics include knowledge representation, functional and logic programming, machine learning, natural language understanding, computer vision, robotics, and societal impact.

CSC 571 Game Design and Development (3 Credits)

This course introduces students to game design and development concepts. Topics include the history of games, genres, play elements, story and character development, game play and storyboard design, level and user interface design, and the game design document.

CSC 572 3D Game Programming (3 Credits)

This is a project-oriented course on 3D game, programming. Students will work in teams to, design, implement and test- dimensional game with, interactivity, game state diagram, animation,, sound, and constraints. Students will also learn, the basics of graphic design and animation.

CSC 573 Principals of Modeling and Simulation (3 Credits)

This course introduces students to the major areas of simulation and the languages and systems used in these areas. Areas of simulation to be covered include gaming, military, health, network, business processes and transportation. The types of simulation software to be discussed include process oriented, discrete event oriented, general purpose, and simulation environments

CSC 577 Advanced Computer Topics IV (3 Credits)

Advanced computer topics not generally covered in the curriculum. Designed as a Computer Science elective – not as a replacement for any specific required course.

CSC 580 Computer Graphics (3 Credits)

Designed to focus on interactive computer graphics hardware and software: display devices, 2D and 3D geometric transformations, raster algorithms, representation of curves and surfaces, hidden line removal and surfaces, shading algorithms, and color graphics.

CSC 593 Systems Programming (3 Credits)

Fundamentals of system and network programming methodology, techniques, system calls and library calls.

CSC 596 Compiler Construction (3 Credits)

An introduction to the fundamentals of compiler construction and language translation. Topics include lexical analysis, specifications of syntax, algorithms for syntactic analysis, code generation, and optimization techniques.

CSC 611 Machine Learning (3 Credits)

Machine learning is a subfield of artificial intelligence concerned with the design, analysis, implementation, and applications of programs that learn from experience. This course is about learning to extract statistical structure from data for making decisions, predictions, and visualizations. It gives in-depth coverage of advanced methods in machine learning, emphasizes approaches with practical relevance, and discusses a number of recent applications of machine learning.

CSC 612 Computational Science (3 Credits)

Computational Science is a rapidly emerging field to foster collaborative research to cover a wide variety of science disciplines. This is a one-semester course to provide students with an overview of applications of computational skills to solve scientific research problems. The computational skills in review include: Programming Languages, Algorithms, Database Implementation, Internet technologies, Data Visualization, Statistics, Modeling and simulation, and Operations Research.

CSC 625 Analysis of Algorithms (3 Credits)

Design and analysis of algorithms. Topics include Turing machines, NP-Complete theory, best, average, and worst case analysis; divide-and-conquer, greedy method, dynamic programming, graph traversal, backtracking, and branch-and-bound techniques. sorting, searching, graph algorithms, and optimization.

CSC 630 Computer Networks (3 Credits)

A one-semester, advanced graduate-level course focusing on the concept of internetworking in general and the TCP/IP Internet technology in particular. The course reviews both the architecture of network interconnections and the principles underlying protocols that make interconnected networks function as a single, unified communication system. It also covers how an Internet communication system can be used for distributed computation and communication.

CSC 635 Computer Security II (3 Credits)

Intrusion Detection Systems, Malicious software (viruses, worms, and other rogue programs), Advanced risk analysis methodologies, international standards and computer security models (Bell and LaPadula, Biba, Clark and Wilson), Network and Distributed Security, Database Security.

CSC 640 Introduction to Data Science (3 Credits)

The main objective of this course is to introduce, fundamental concepts and practices in data, science with a focus on designing and, implementing small-scale data analytic projects, through their life cycles in a lab environment., Data science is one of the most important emerging, computing technologies and applications that are, being developed at a

CSC 650 Cryptography (3 Credits)

Study of historical and modern cryptographic techniques and algorithms. Topics include symmetric and asymmetric key cryptography, one-way functions, secure hash functions, digital signatures, key exchange, authentication, key management, PKI, DES, AES (Rijndael), current topics.

CSC 660 Parallel Computing (3 Credits)

Study of high performance computing techniques. Includes the study of parallel computer architecture, memory, and I/O. Also, parallel computer algorithms to include shared and distributed memory, parallel computation models, graph algorithms, numerical algorithms, divide-and-conquer.

CSC 668 Advanced Computer Architecture (3 Credits)

Principles and advanced topics of the instruction set architecture for uni-processors, embedded system processor, and multi-processor.

CSC 672 Digital Forensics (3 Credits)

Contact the department for specific course information.

CSC 678 Scientific Visualization (3 Credits)

Fundamental concepts of the algorithms and design principles underlying modern 3D computer graphics, data and scientific visualization.

CSC 691 Graduate Independent Study I (3 Credits)

Supervised independent project designed to give computer science graduate students an opportunity to explore a single topic in a one-to-one learning relationship with a faculty member.

CSC 697 Ethical Hacking and Penetration Testing (3 Credits)

Contact the department for specific course information

CSC 701 Continuing Registration (1-9 Credits)

A one credit hour course that allows students to maintain continuous registration status. Does not count towards the MS.CSC degree credits.

CSC 702 Practicum I (1 Credits)

A one credit-hour course that allows students to apply their skills in a work setting. The credit earned through this course will not be counted towards M.S.CSC degree credit. A student can take this course, and repeat it for up to three times, when he/she is away from campus on outside employment for internship or practical training in a related technical field. This is a Pass/Fail course.

CSC 703 Graduate Research (3-9 Credits)

This course is designed to give students an opportunity to conduct research through practical experience with a graduate research advisor. It gives students an opportunity to gain exposure to a subset of tasks such as development and implementation of a research topic, literature, writing status and technical reports or papers for conference submission, and attending and making technical presentations. Topics vary based on the student's research activities.

CSC 720 Wireless Sensor Networks (3 Credits)

An advanced, graduate-level course focusing on study of wireless sensor networks from communications, security, and computing platform viewpoints. Wireless sensor networks are a sensing, computing and communication infrastructure enabling the monitoring and manipulating of the environment.

CSC 730 Advanced Topics in Networking (3 Credits)

This course includes the major fields in optical networks, dynamic spectrum access in wireless networks, cognitive radio networks, network coding, and other newly emerged networking technologies. For optical networks, the topics include WDM network elements, routing and wavelength assignment algorithms, blocking probability analysis, virtual/physical topology design, survivability, and IP over WDM. For dynamic spectrum access or cognitive radio networks, the topics include enabling technologies for cognitive radio, channel assignment/selection, routing, security, and spectrum management. This course will also cover network coding and other new ideas.

CSC 745 Network Defense (3 Credits)

Focuses on network defense and countermeasures, including firewalls, intrusion detection and prevention systems, virtual private networks.

CSC 750 Evolutionary Computing (3 Credits)

The fundamentals of applying biological evolutionary characteristics to optimization of very complex problems.

CSC 755 Cloud Computing (3 Credits)

A one-semester graduate-level course focuses on cloud computing technologies and solutions. It is designed to give students a solid foundation in cloud computing fundamentals. The course covers both the conceptual and practical aspects of cloud computing.

CSC 760 Secure Software Development (3 Credits)

Introduction to basic concepts and the latest research trends and results in developing secure software. Topics include the best practices in developing secure software within Software Development Lifecycle (SDLC), vulnerability assessment, and code analysis techniques.

CSC 765 Advanced Topics in Information Assurance (3 Credits)

Survey of current topics in Information Assurance

CSC 781 Advanced Graduate Topics I (3 Credits)

Advanced computer topics not generally covered in the graduate 600/700 level curriculum. Designed as a Computer Science graduate elective – not as a replacement for any core course.

CSC 782 Advanced Graduate Computer Topics II (3 Credits)

Advanced computer topics not generally covered in the graduate 600/700 level curriculum. Designed as a Computer Science graduate elective – not as a replacement for any core course.

CSC 791 Graduate Independent Study II (3 Credits)

Supervised independent project designed to give computer science graduate students an opportunity to explore a single topic in a one-to-one learning relationship with a faculty member.

CSC 795 Masters Project (3 Credits)

First semester of the Master's Thesis sequence. Under the supervision of the thesis director, students prepare a thesis proposal and work toward the goal of completing all background material needed for their research. Minimally, a satisfactory thesis draft will be used to satisfy completion of the course. The Graduate Committee must approve the thesis topic.

CSC 798 Masters Thesis I (3 Credits)

First semester of the Master's Thesis sequence. Under the supervision of the thesis advisor, students prepare a thesis proposal and work toward the goal of completing all background material needed for their research. Minimally, a satisfactory thesis draft will be used to satisfy completion of the course. The Graduate Committee must approve the thesis topic.

CSC 799 Masters Thesis II (3 Credits)

The culmination of the two semester master's thesis sequence. Students must complete the thesis and defend it to a committee.