COMPUTER SCIENCE (CSC)

CSC 115. Social and Ethical Issues in Computing. 3 Credit Hours.
History, social context and methods and tools of analysis. Professional and ethical responsibilities. Intellectual property. Privacy and civil liberties.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CSC 118. Information Technology and Society. 3 Credit Hours.
A variety of topics on information technology and society through various course activities including research papers, experiments, and by reading articles. The topics covered include but are not limited to: history of computing, hardware mechanisms, algorithms design, software development principles, software tools, security, and artificial intelligence.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Summer.

CSC 119. Computers and Society. 3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Summer.

CSC 120. Computer Programming I. 4 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

CSC 200. Cybersecurity: An Introduction to Security in Cyber Space. 3 Credit Hours.
An introduction to cybersecurity, for all students. Recent incidents. The internet. Cyberattacks. Defending against cyber attacks. Tools to protect individual users and computernetworks. Legal, moral, and social aspects of cyber security.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CSC 210. Computing for Scientists. 3 Credit Hours.
Computing applications in science. Tools and algorithms for applications. Implementation of algorithms. Storage, retrieval analysis and visualization of data in science. Prerequisite: MTH 141 or MTH 151 or MTH 161 or MTH 171.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

CSC 220. Computer Programming II. 4 Credit Hours.
Common APIs including list, priority queue, set, and map, and their efficient implementations in an object-oriented language using fundamental data structures. Sorting and other applications of recursion. Combining asymptotic analysis and experiments to extrapolate running times. Using APIs in a software project. Prerequisites: CSC 120 or CIS 324 or ECE 218, MTH 108 or MTH 140 or MTH 141 or MTH 161 or MTH 162 or MTH 171 or MTH 172 or MAS 110.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

CSC 314. Computer Organization and Architecture. 3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

CSC 317. Data Structures And Algorithm Analysis. 3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

CSC 322. System Programming. 3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CSC 329. Introduction to Game Programming. 3 Credit Hours.
Fundamental programming issues in game design: Software design; Version control; Basic graphics; GUI programming. Large-scale game project: Team development of a functional game; Graphics and GUI component; Networking component; Core game engine. Prerequisite: CSC 220 or ECE 318.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CSC 330. Android Programming. 3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.
CSC 401. Computer Science Practicum I. 1 Credit Hour.
Implementation of techniques, algorithms, and data structures being
taught in a co-requisite computer science course.
Components: PRA.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 402. Computer Science Practicum II. 1 Credit Hour.
Implementation of techniques, algorithms, and data structures being
taught in a co-requisite computer science course.
Components: PRA.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 403. Computer Science Practicum III. 1-3 Credit Hours.
Implementation of techniques, algorithms, and data structures being
taught in a co-requisite computer science course.
Components: PRA.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 405. Computer Science Seminars. 1 Credit Hour.
A range of topics in Computer Science, as embodied in the seminars
hosted by the Department.
Components: SEM.
Grading: GRD.
Typically Offered: Fall & Spring.

CSC 410. Computer Science Project Planning. 1-3 Credit Hours.
Planning for the implementation of a Computer Science project,
including: Problem analysis, System architecture design, Algorithm and
data structure selection, User interface design, Verification and validation
plan, and Prototyping.
Components: PRA.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 411. Computer Science Project Implementation. 1-3 Credit Hours.
Implementation of a Computer Science project, including: Hardware
preparation, Component implementation, System integration, Verification and validation,
and Documentation.
Components: PRA.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 412. Computer Science Internship. 1-3 Credit Hours.
A commercial computing environment. Normally 50 internship hours are
required per credit earned (the host company must supply documentary
evidence of hours worked).
Components: PRA.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 419. Programming Languages. 3 Credit Hours.
Overview of programming languages. Fundamental issues in language
Prerequisite: CSC 317 or CSC 517.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 421. Principles Of Computer Operating Systems. 3 Credit Hours.
Prerequisite: CSC 314 and CSC 322.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

CSC 423. Database Systems. 3 Credit Hours.
Information models and systems. Database systems. Data modeling.
Relational databases. Relational database design. Database query languages, Data mining concepts, Web database programming.
Prerequisite: CSC 322 Or ECE 322.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 424. Computer Networks. 3 Credit Hours.
Prerequisite: CSC 314 and CSC 322.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

CSC 427. Theory Of Computing. 3 Credit Hours.
Sets, relations, and languages. Automata theory. Basic computability theory. Turing machines. The complexity classes P and NP.
Prerequisite: CSC 220 or ECE 318, and MTH 309.
Components: LEC.
Grading: GRD.
Typically Offered: Spring.

CSC 431. Introduction To Software Engineering. 3 Credit Hours.
Prerequisite: CSC 317 or CSC 322 or CSC 517.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

CSC 481. Teaching Assistant Training in Computer Science. 1-3 Credit Hours.
Training and teaching assistant for a specific course, in computer laboratories . May be taken multiple times, assisting maximally twice for a given course.
Components: PRA.
Grading: GRD.
Typically Offered: Fall & Spring.

CSC 498. Senior Topics in Computer Science. 3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.
CSC 506. Logic. 3 Credit Hours.
Propositional and first order logic: completeness. Computational logic: Robinson's resolution. Formalized theories: arithmetic, Godef's incompleteness theorem, Tarski's theorem on undefinability of truth. Prerequisite: MTH 230 or PHI 210 or PHI 510.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 507. Data Security and Cryptography. 3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 518. Interpreters and Compiler Theory. 3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 528. Introduction to Parallel Computing. 3 Credit Hours.
Parallel computing systems shared-memory parallel programming, with open MP, distributed-memory parallel programming, software with open MPI software package. Applications: vector and matrix operations, sorting, image processing. Prerequisite: CSC 317.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 529. Introduction to Computer Graphics. 3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 540. Algorithm Design and Analysis. 3 Credit Hours.
Design techniques include divide-and-conquer, greedy method, dynamic programming, backtracking. Time and space complexity. Sorting, searching, combinatorial and graph algorithms. Prerequisite: CSC 317.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 545. Introduction to Artificial Intelligence. 3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 547. Computational Geometry. 3 Credit Hours.
Algorithms for solving geometric problems arising from application domains including graphics, robotics, and GIS. Prerequisite: CSC 317.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 548. Bioinformatics Algorithms. 3 Credit Hours.
The complexity of bioinformatics computations. Introduction to perl and bioperl. Pattern matching and sequence homology. Genome assembly. Transcription factor Binding Site recognition and motif finding. Gene prediction. Phylogeny. Micro-array analysis. RNA folding. Gene design and synthesis. Prerequisites: CSC 120 or CSC 210, BIL 150 or BIL 104 or BIL 352 or BIL 552 or CSC 552.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CSC 549. Biomedical Data Science. 3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 552. Bioinformatics Tools. 3 Credit Hours.
Databases and tools of bioinformatics, as relevant to research in genomics and molecular biology. Bioinformatics applications. Information retrieval, analytical tools, BLAST searches, promoter analysis, and protein structure-function analysis, and various applications. Prerequisite: BIL 250 or BIL 150.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CSC 555. Multimedia Systems. 3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 595. Topics in Computer Science. 1-3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 596. Topics in Computer Science. 1-3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 597. Topics in Computer Science. 1-3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.
CSC 598. Topics in Computer Science. 1-3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 599. Topics in Computer Science. 1-3 Credit Hours.
Components: THI.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 607. Logic. 3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 609. Data Security and Cryptography. 3 Credit Hours.
Prerequisite: CSC 317 or CSC 427.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 618. Interpreters and Compiler Theory. 3 Credit Hours.
Prerequisite: CSC419.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 629. Theory of Relational Databases. 3 Credit Hours.
Prerequisite: CSC 423.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 632. Introduction to Parallel Computing. 3 Credit Hours.
Parallel computing systems shared-memory parallel programming, with open MP, distributed-memory parallel programming, software with open MPI software package. Applications: vector and matrix operations, sorting, image processing.
Prerequisite: CSC 317.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 640. Algorithm Design and Analysis. 3 Credit Hours.
Design techniques include divide-and-conquer, greedy method, dynamic programming, backtracking. Time and space complexity. Sorting, searching, combinatorial and graph algorithms.
Prerequisite: CSC 317.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 645. Introduction to Artificial Intelligence. 3 Credit Hours.
Prerequisite: CSC 545.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 647. Computational Geometry. 3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 649. Bioinformatics Algorithms. 3 Credit Hours.
Prerequisite: CSC 317.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 656. Multimedia Systems. 3 Credit Hours.
Computer Science (CSC)

CSC 686. Topics in Computer Science. 1-3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 687. Topics in Computer Science. 1-3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 689. Directed Reading. 2-4 Credit Hours.
Components: THI.
Grading: GRD.
Typically Offered: Fall & Spring.

CSC 690. Directed Research. 2-4 Credit Hours.
Components: THI.
Grading: GRD.
Typically Offered: Fall & Spring.
CSC 688. Topics in Computer Science. 1-3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 689. Topics in Computer Science. 1-3 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 690. Seminar for Beginning Graduate Students. 1-3 Credit Hours.
Flexible topics of interest to beginning graduate students.
Components: THI.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 692. Seminar. 1-2 Credit Hours.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 707. Logic Programming. 3 Credit Hours.
Programming in Prolog, Fix-point semantics, Declarative semantics, Completeness of SLD-resolution, Negation, Implementation of logic programming languages. Deductive databases.
Prerequisite: MTH 506 and CSC 317.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 711. Theory of Computation. 3 Credit Hours.
Recursive functions, Markov algorithms, Turing machines. Unsolvability.
Prerequisite: CSC 317 or CSC 517.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 712. Complexity Theory. 3 Credit Hours.
Models of computations, Blum's axioms, intractability, NP-completeness.
Prerequisite: CSC 427.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 724. Mobile Wireless Systems. 3 Credit Hours.
Cellular Systems, multiple access techniques, wireless networking, mobile IP, power management, user location information management, TDMA, CDMA, and GSM systems, data broadcasting.
Prerequisite: CSC 424.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 732. Parallel Algorithms. 3 Credit Hours.
Parallel computation models; sorting networks; parallel algorithms for sorting, searching, graph problems, prefix computation, pattern matching, and fast Fourier transforms; theory of P-completeness, the class NC.
Prerequisite: CSC 317.
Components: LEC.
Grading: GRD.
Typically Offered: Fall.

CSC 746. Neural Computing. 3 Credit Hours.
Prerequisite: CSC 317.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 749. Automated Reasoning. 3 Credit Hours.
Prerequisite: CSC 317 or CSC 645.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 751. Semantic Web. 3 Credit Hours.
An overview of the underlying semantic web technologies. Ontology construction and implementation using tools and APIs (logic, XML, RDF, RDFS). Theoretical and practical aspects of knowledge representation (description logic, RDF, RDFS, SPARQL, SROIQ(D)). Designing and debugging ontologies (ontology engineering, entailment tools, project).
Prerequisite: CSC 317 and MTH 309.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 752. Autonomous Robotic Systems. 3 Credit Hours.
Prerequisite: CSC 317 and MTH 210.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 756. Advanced Multimedia Systems. 3 Credit Hours.
Prerequisite: CSC 656.
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 785. Advanced Topics in Computer Science. 1-3 Credit Hours.
Advanced Topics in Computer Science
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.
CSC 786. Advanced Topics in Computer Science. 1-3 Credit Hours.
Advanced Topics in Computer Science
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 787. Advanced Topics in Computer Science. 1-3 Credit Hours.
Advanced Topics in Computer Science
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 788. Advanced Topics in Computer Science. 1-3 Credit Hours.
Advanced Topics in Computer Science
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 789. Advanced Topics in Computer Science. 1-3 Credit Hours.
Advanced Topics in Computer Science
Components: LEC.
Grading: GRD.
Typically Offered: Offered by Announcement Only.

CSC 793. RESEARCH PROJECT. 1-6 Credit Hours.
Supervised research project preceding dissertation research for the Ph.D.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

CSC 794. Research Project. 1-6 Credit Hours.
Supervised research project preceding dissertation research for the Ph.D.
Components: LEC.
Grading: GRD.
Typically Offered: Fall & Spring.

CSC 810. Master's Thesis. 1-6 Credit Hours.
The student working on his/her master's thesis enrolls for the number of credits as determined by his/her advisor. Credit is not awarded until the thesis has been accepted.
Components: THI.
Grading: SUS.
Typically Offered: Fall & Spring.

CSC 825. Continuous Registration--Master's Study. 1 Credit Hour.
To establish residence for non-thesis master's students who are preparing for major examinations. Credit not granted. Regarded as full time residence.
Components: THI.
Grading: GRD.
Typically Offered: Fall & Spring.

CSC 840. Post-Candidacy Doctoral Dissertation. 1-12 Credit Hours.
Required of all candidates for the Ph.D. who have advanced to candidacy. The student will enroll for credit as determined by his/her advisor, but not for less than a total of 12. Not more than 12 hours of CSC 740 may be taken in a regular semester, nor more than six in a summer session.
Components: THI.
Grading: SUS.
Typically Offered: Spring.

CSC 850. Research In Residence. 1 Credit Hour.
Used to establish research in residence for Ph.D. students after the student has enrolled for permissible cumulative total in appropriate doctoral research. Regarded as full-time residence.
Components: THI.
Grading: SUS.
Typically Offered: Fall, Spring, & Summer.