COMPUTER SCIENCE (CS)

CS 405G Numerical Analysis I 3 Hours
Computer arithmetic, roots of equations, polynomial approximation and interpolation, numerical differentiation and integration. Computer solutions of problems will be required.
Prerequisite(s): (MATH 307 or MATH 310 or MATH 237) and (CS 180 or CS 146) or permission of instructor
Equivalent(s): MATH 405G
Recent Term(s) Offered: fall 2022

CS 443G Database Management Systems 3 Hours
Organization and management of large data files, various database paradigms, database design theory, query optimization, physical database design, database security, distributed databases. Note: Credit will not be given for CS 443 or CS 443G once credit has been received for CS 543.
Prerequisite(s): CS 360 or permission of instructor
Recent Term(s) Offered: fall 2022; fall 2023

CS 445G Operating Systems II 3 Hours
Advanced study of modern operating system theory and practice. Topics include distributed system structures and coordination, distributed file systems, and protection and security.
Prerequisite(s): CS 425
Recent Term(s) Offered: spring 2022; spring 2023; spring 2024

CS 446G Interactive Computer Graphics 3 Hours
Elementary topics in interactive computer graphics. Includes both input and display devices and techniques for 2-D and 3-D transformations, as well as difficulties encountered in these areas. Computing assignments will emphasize interaction, data structures, and applications to various disciplines.
Prerequisite(s): MATH 307
Recent Term(s) Offered: None

CS 450G Computer Networks 3 Hours
An advanced study of the design and implementation of computer networks. Topics include network topologies, switching techniques, routing, end-to-end protocols, quality of service, and other advanced topics, e.g. wireless networks and multimedia networks. Note: Credit will not be given for CS 450 or CS 450G once credit has been received for CS 550.
Prerequisite(s): CS 425 or permission of instructor
Recent Term(s) Offered: None

CS 456G Artificial Intelligence 3 Hours
Problems having no plausible algorithmic solution, their computer representations and solutions which usually involve heuristics.
Prerequisite(s): CS 360
Recent Term(s) Offered: fall 2023

CS 475G Topics/Computer Science 1-3 Hours (repeatable max of 6 hrs)
Significant problems and developments in computer science. Note: Permission of instructor required.
Prerequisite(s): permission of instructor
Recent Term(s) Offered: None

CS 500 Research Methods and Projects 3 Hours
A graduate level overview of problem-solving techniques and skills for computer-based systems including solution design and implementation. Topics include a team project to develop practical skills in documentation, communication, and module interfacing. The course may be used only in fulfilling the research tool requirement and may not be used toward an undergraduate degree in computer science.
Recent Term(s) Offered: spring 2022; fall 2023

CS 530 Automata Theory and Compiler Construction 3 Hours
The basic theoretical concepts of the computer viewed as an automaton. Automated tools for scanning and parsing will be studied to show how regular expressions and BNF languages are used in compiler construction and other computer applications.
Recent Term(s) Offered: spring 2022; fall 2023

CS 535 Cloud Computing 3 Hours
This course will provide insight on the current trends of local and public cloud computing systems. Three distinct design layers will be covered: Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS). Topics include, but are not limited to, cloud computing architectures, virtual resource management, green clouds, data management, and user interface.
Recent Term(s) Offered: fall 2024

CS 541 Theory of Computation 3 Hours
An advanced study of the theory of computing, including languages, finite automata, grammars, Turing machines, complexity and computability.
Prerequisite(s): CS 530
Recent Term(s) Offered: None

CS 543 Advanced Database Systems 3 Hours
An advanced study of data and information management. Topics include database application development, XML data management, data storage and indexing, transaction management, parallel and distributed databases, data warehousing and decision support.
Prerequisite(s): CS 443 or equivalent
Recent Term(s) Offered: summer 2023; fall 2024

CS 544 Compiler Theory/Design 3 Hours
Formal properties of programming languages and the techniques used to construct compilers for these languages. Topics include lexical analysis, syntax analysis, symbol table construction, semantic analysis, code generation, and optimization. Students will complete a programming project.
Prerequisite(s): CS 500 and CS 530
Recent Term(s) Offered: None

CS 545 Systems Programming 3 Hours
A study of the system call interface of operating systems. Topics include low level file I/O, signal handling, interprocess communication, distributed communication, and process management. Students will write several systems level programs. The student develops a small operating system.
Prerequisite(s): CS 445
Recent Term(s) Offered: None

CS 549 Analysis of Algorithms 3 Hours
Methods (algorithms) for solving a variety of problems on computers and the relative efficiency of these algorithms.
Recent Term(s) Offered: spring 2023; fall 2024

CS 555 Data Science 3 Hours
An introduction to concepts and methods in the emerging field of data science. Agorithms and tools to support problem-focused data-analytic thinking.
Recent Term(s) Offered: spring 2022; spring 2023; spring 2024

CS 560 Software Engineering and Project Management 3 Hours
Survey of modern software development techniques, including traditional and agile approaches. Topics include requirement definition, process modeling, design methods, human factor issues, and an introduction to software project management. Student will be required to model a project using Unified Modeling Language.
Prerequisite(s): CS 360
Recent Term(s) Offered: fall 2022; spring 2024

CS 562 Parallel and Distributed Computing 3 Hours
An introduction to parallel and distributed computing. The development, implementation, and analysis of parallel algorithms will be studied.
Recent Term(s) Offered: fall 2023

CS 565 Data Mining Techniques and Tools 3 Hours
The theory and application of data mining, roots of data mining, preprocessing techniques for raw data, classification algorithms and techniques, clustering algorithms and techniques, association rule mining algorithms and techniques.
Prerequisite(s): CS 443G or equivalent
Recent Term(s) Offered: fall 2022

CS 568 Computer Vision 3 Hours
A study of the techniques and applications of computer vision. Topics include pattern recognition, filtering, texture, segmentation, recognition, 3D vision and case studies. Important algorithms will be implemented by students.
Prerequisite(s): CS 500
Recent Term(s) Offered: spring 2023

CS 570 Security in Computing 3 Hours
Essential techniques in cryptography and computer security. Privacy issues in a broad range of computing contexts. Topics include program security, trusted operating systems, database/data mining security, and network security.
Prerequisite(s): CS 445G or CS 450G or equivalent
Recent Term(s) Offered: spring 2022; spring 2024

CS 595 Advanced Topics/Computer Science 1-3 Hours (repeatable max of 6 hrs)
Significant problems and current developments in computer science. Note: 9 hours of CS required.
Prerequisite(s): permission of instructor
Recent Term(s) Offered: None

CS 599 Thesis Research/Writing 1-6 Hours (repeatable max of 6 hrs)
Thesis research and writing directed by faculty committee.
Recent Term(s) Offered: spring 2022; fall 2022; summer 2024; fall 2024

CS 600 Maintain Matriculation 1-6 Hours (repeatable max of 6 hrs)
Continued enrollment for thesis completion.
Recent Term(s) Offered: spring 2022; fall 2022; spring 2023; summer 2023; fall 2023; spring 2024