

Computer Science (M.S.)

About The Program:

The M.S. in Computer Science emphasizes a general approach to the study of computing, including courses in artificial intelligence, collaborative systems, computer architecture, database systems, graphics and image processing, networking and communications, operating systems, software engineering, and theoretical areas. The curriculum is not oriented toward any specific applications area of computing but emphasizes general graduate-level studies in computing, preparing students for careers in systems analysis, teaching, and research.

Career Options: Graduates often find employment as data analysis consultants, product designers, researchers, and software developers. Alternatively, many become involved in the design and implementation of new applications software or the planning and evaluation of computer-based systems. Prospective employers include the government or industrial firms that utilize computers for research and/or production purposes.

Prerequisites for Admission: One year of Calculus (Differential and Integral), Object Oriented Programming, Data Structures using C++ or Java, Computer Organization & Systems Programming, Operating Systems (hands on, programming O/S components), Algorithms, Discrete Math, Computer Science Theory

Areas of Specialization: Research interests of faculty include:

- Analysis of algorithms
 - Artificial intelligence
 - Communication and networks
 - Computer architecture
 - Data analytics
 - Digital forensics
 - Flexible and intelligent manufacturing systems
 - Graphics
 - High-performance computing
 - Information security and assurance
 - Intelligent CAI systems
 - Management information and database systems
 - Natural language processing
 - Network security
 - Parallel and distributive processing and operating systems
 - Programming languages
 - Sensory and image processing
 - Software engineering
 - Theory of automata and computation
 - Wired and Wireless Networks
-

Requirements of Programs:

- **Total Credit Hours:** 30
- **Culminating Events:** Students complete a master's research project as the culminating event. [CIS 9991](#) Master's Research Projects is taken for 3 credits under the close supervision of CIS Graduate Faculty.

Core Courses

Programming Techniques – A more formalized view of data structures. Stacks, trees, tables, lists, multilinked structures, strings and files are considered. These are viewed in terms of their general usefulness in the construction of algorithms and in their efficient implementation. Both theoretical results and programming techniques will be stressed.

Operating Systems – Basic principles of operating systems; multi-tasking systems; control and coordination of tasks; deadlocks; synchronization, mutual exclusion, sharing; memory management, virtual memories, segmentation, paging; protection; file systems; resource management; evaluation and prediction of performance; design and implementation of operating systems in high-level languages.

Design and Analysis of Algorithms – The course objective is to provide students with an understanding of the principles and techniques used in the design and analysis of efficient algorithms. The main topics cover Greedy Algorithms, Divide and Conquer, Dynamic Programming, Network Flow, and Approximation Algorithms. Theoretical results related to NP-completeness will also be discussed.

Electives (18 Credits Worth)

Master's Research Projects – Short-term, limited research project or laboratory project in the field. This course is not the capstone project course, nor can it be used for thesis based research. The course is for master's students only, including PSM, MA or MS. This class will not confer full-time program status unless nine credits are taken.

Courses:

Click [HERE](#) for more information on the courses below.

- Comp-Based Appl Prog
- Database Design & Programming
- Networking & Operating Systems
- Programming and Data Structure
- System Software and Operating Systems
- Discrete Structure of Computer Science
- Scripting for Sciences and Business
- Data Structures and Objects
- Operating Systems and Architecture
- IT Process Management
- System Development Processes
- Comp Systems Security & Privacy
- Emerging Technologies
- Knowledge Management
- Seminar in Information Science and Technology
- Software Quality Assurance and Testing
- Software Project Management
- Advanced Database Management Systems
- Usability Engineering
- Network Technologies
- Software Engineering
- Introduction to Digital Forensics

- Advanced Seminar in Information Science and Technology
- Ethical Hacking and Intrusion Forensics
- Audit and Compliance for Security and Digital Forensics
- Programming Techniques
- Operating Systems
- Automata and Formal Languages
- Design and Analysis of Algorithms
- Principles of Data Management
- Data-Intensive and Cloud Computing
- Knowledge Discovery and Data Mining
- Analysis and Modeling of Social and Information Networks
- Neural Computation
- Machine Learning
- Data Warehousing, Filtering and Mining
- Probabilistic Graph Models
- Text Mining and Language Processing
- Computer Vision
- Topics in Computer Science
- Artificial Intelligence
- Computer Networking and Communication
- Energy Management in Data Centers and Beyond
- Security in Cyber-Physical Systems
- Ad Hoc Networks
- Network & Information Security
- Wireless Network and Communication
- Computer Architecture
- Emerging Storage Systems and Technologies
- Distributed Systems
- Seminars in Computer and Information Science
- Seminar in Advanced Topics in Computer Science
- Computer Graphics and Image Processing
- User Interface Design and Systems Integration
- Web Applications Development
- Artificial Intelligence, Heuristic Models, and Education
- Advanced Topics in Data Base Systems
- Advanced Networks and Client-Server Computing
- Design and Development of E-Commerce Systems
- Distributed and Parallel Computer Systems
- Master's Research Projects
- Preliminary Examination Preparation
- Capstone Project
- Master's Thesis Research