COMPUTER SCIENCE

Contact: (845) 257-3990

Master of Science in Computer Science

This program provides students with a foundation for professional work, or doctoral level study in Computer Science. Courses include current programming technologies and application areas, and theoretical Computer Science.

Students use both Linux and Windows workstations for program development.

Graduate Program in Computer Science

- MS in Computer Science

CPS502. Discrete Structures. 3 Credits.

Essential mathematical concepts for computer science. Sets, functions, sequences and sums, relations, logic and proofs, induction and recursion, probability concepts. Linear algebra.

Restrictions:
- Must have the following level: Graduate
- Must be enrolled in the following field(s) of study (major, minor or concentration):
- • BA/BS MS Computer Science (270M)
  - Computer Science (270)

May not be repeated for credit

CPS526. Advanced Data Structures. 3 Credits.

In-depth study of methods for organizing, retrieving, and modifying data in digital computers, as well as mathematical analysis of these techniques.

Attributes:
- Liberal Arts

Restrictions:
- Must have the following level: Graduate

May not be repeated for credit

CPS528. Algorithms. 3 Credits.

Algorithms for a variety of applications. Various design and analysis techniques. Probabilistic and approximation algorithms.

Attributes:
- Liberal Arts

Restrictions:
- Must have the following level: Graduate

May not be repeated for credit

CPS530. Computer Networks. 3 Credits.

Network topology and communication media, resource sharing, performance analysis, protocols, local networks.

Restrictions:
- Must have the following level: Graduate

May not be repeated for credit

CPS532. Theory of Computation. 3 Credits.

Computability by Turing machines, grammars, and recursive functions. Uncomputability and computational complexity.

Attributes:
- Liberal Arts

Restrictions:
- Must have the following level: Graduate

May not be repeated for credit

CPS534. Foundations of Computer Science. 3 Credits.

Some fundamental topics in computer science are in areas of logic, computation, algorithms, data structures and automation. This course will cover selected topics in each of these areas.

Restrictions:
- Must have the following level: Graduate
- Must be enrolled in the following field(s) of study (major, minor or concentration):
- • BA/BS MS Computer Science (270M)
  - Computer Science (270)

May not be repeated for credit

CPS536. Machine Learning. 3 Credits.

How to build systems that learn and adapt using examples from real-world applications. Main topics include linear discriminants, principal components, decision trees, support vector machines, unsupervised learning and neural networks.

Restrictions:
- Must have the following level: Graduate
- Must be enrolled in the following field(s) of study (major, minor or concentration):
- • BA/BS MS Computer Science (270M)
  - Computer Science (270)

May not be repeated for credit

CPS540. Artificial Intelligence. 3 Credits.

Intelligent Agents, Problem solving by searching, Knowledge and reasoning, Uncertainty, Machine learning .

Restrictions:
- Must have the following level: Graduate

May not be repeated for credit

CPS551. Programming and Data Structures. 3 Credits.

The course covers object-oriented programming in Java using basic data structures, including arrays, linked lists, stacks and queues, binary trees, and binary search trees.

Restrictions:
- Must have the following level: Graduate
- Must be enrolled in the following field(s) of study (major, minor or concentration):
- • BA/BS MS Computer Science (270M)
  - Computer Science (270)

May not be repeated for credit

CPS553. Web and Database Programming. 3 Credits.
Introduction to web development and database design using the Software Development Lifecycle. Designing and programming a normalized relational database and full stack web application. JavaScript, Node.js, Express.js, MySQL and other modern technologies used.
Restrictions:
- Must have the following level: Graduate
- Must be enrolled in the following field(s) of study (major, minor or concentration):
- • BA/BS MS Computer Science (270M)
  - Computer Science (270)

May not be repeated for credit

CPS554. User Interface Programming. 3 Credits.
Introduction to creating and maintaining full-stack web applications utilizing various frameworks and libraries. Students will learn how to create, manage and access non-relational databases.
Restrictions:
- Must have the following level: Graduate

May not be repeated for credit

CPS580. Functional Programming. 3 Credits.
The functional language mode, lambda calculus, functional programming in one or more languages, the design and implementation of an interpreter for a functional programming language.
Restrictions:
- Must have the following level: Graduate

May not be repeated for credit

CPS590. Thesis in Computer Science. 3-6 Credits.
Preparation and writing of a thesis under the guidance of graduate faculty. Required form available in the Records and Registration Office.
Restrictions:
- Must have the following level: Graduate

May not be repeated for credit

CPS593. Computer Science Selected topic. 3-12 Credits.
Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.
Restrictions:
- Must have the following level: Graduate

May be repeated for credit

CPS594. Fieldwork Comp Science. 1-12 Credits.
Attributes:
- Liberal Arts

Restrictions:
- Must have the following level: Graduate

May not be repeated for credit

CPS595. Indep Study Comp Science. 1-12 Credits.
Restrictions:
- Must have the following level: Graduate

May be repeated for credit

CPS599. Comprehensive Exam Workshop. 0 Credits.
Restrictions:
- Must have the following level: Graduate
- Must be enrolled in the following field(s) of study (major, minor or concentration): Computer Science (270)

May not be repeated for credit

CPS693. Computer Science Selected Topic. 3-12 Credits.
Restrictions:
- Must have the following level: Graduate

May be repeated for credit

CPS793. Computer Science Selected Topic. 3-12 Credits.
Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.
Restrictions:
- Must have the following level: Graduate

May be repeated for credit

CPS795. Indep Study Comp Science. 0 Credits.
Restrictions:
- Must have the following level: Graduate

May be repeated for credit

CPS799. Continued Registration. 1 Credit.
Restrictions:
- Must have the following level: Graduate

May be repeated for credit