COMP 505: Theory of Computation
3 Credits
Topics in discrete mathematics, discrete probability, first order logic and models of computation.

**Prerequisite:** CMPSC463

COMP 511: Design and Analysis of Algorithms
3 Credits
Amortized analysis, graph algorithms, NP-complete problems, approximation algorithms, parallel algorithms.

**Prerequisite:** CMPSC463

COMP 512: Advanced Operating Systems
3 Credits
A study of the principles and practice of distributed system design, including communication, synchronization, processes, file systems, and memory management.

**Prerequisite:** CMPSC472

COMP 513: Formal Methods for Software Engineering
3 Credits
Object-oriented software development, formal specification techniques and related CASE tools, software re-use, verification and validation, transformational development.

**Prerequisite:** CMPSC487W, COMP 511, or permission of the program

COMP 516: Advanced Programming Languages
3 Credits
Programming paradigms and styles, object-oriented programming, formal semantics, programming language design.

**Prerequisite:** CMPSC460

COMP 517: Computer Security
3 Credits
Introduction to the area of computer security and current issues associated with computer security.

**Prerequisite:** MATH 315

COMP 519: Advanced Topics in Database Management Systems
3 Credits
Concurrency control, crash recovery, query processing, semantic data models, advanced file access, distributed database systems, performance, case studies, advanced applications.

**Prerequisite:** CMPSC430, MATH 315

COMP 520: Artificial Intelligence
3 Credits
Problem solving, knowledge representation, language understanding, perception, learning, artificial neural networks.

**Prerequisite:** CMPSC463

COMP 524: Evolutionary Computation
3 Credits
Topics in evolutionary algorithms and genetic algorithms.

**Prerequisite:** COMP 511 or permission of the program

COMP 545: Computer Architecture
3 Credits
Cache, pipelining, memory design, interconnection networks, multiprocessor systems.

**Prerequisite:** CMPSC312

COMP 594: Master's Studies
3 Credits/Maximum of 3
Presentation of various research techniques, in-depth study of a specific computer science problem, development of a written paper or project, and an oral defense.

**Prerequisite:** A minimum of 2 of the 500-level computer science required courses or permission of the program

COMP 596: Individual Studies
1-9 Credits/Maximum of 9
Creative projects, including nonthesis research, that are supervised on an individual basis and which fall outside the scope of formal courses.

COMP 597: Special Topics
1-9 Credits/Maximum of 9
Formal courses given on a topical or special interest subject which may be offered infrequently; several different topics may be taught in one year or semester.

COMP 600: Thesis Research
1-15 Credits/Maximum of 999
Research into a specific computer science problem, development of a scholarly written paper, and an oral defense.

**Prerequisite:** A minimum of 2 of the 500-level computer science required courses or permission of the program