



# College of Computer, Mathematical and Natural Sciences

## Computer Science - Distributive Areas and Electives Effective Fall 2022

<b>Area 1: Systems</b>	<i>Course</i>	<i>Credits</i>
Computer Systems Architecture	CMSC 411	3
Operating Systems	CMSC 412	4
Computer and Network Security	CMSC 414	3
Introduction to Parallel Computing	CMSC 416	3
Computer Networks	CMSC 417	3
Introduction to Parallel Computing (Fall 2020)	CMSC 498X	3
Big Data Systems (Spring 2018/Spring 2019)	CMSC 498K	3
Real World Computer Security (Fall 2022)	CMSC 498I	3

<b>Area 2: Information Processing</b>	<i>Course</i>	<i>Credits</i>
Data Structures	CMSC 420	3
Introduction to Artificial Intelligence	CMSC 421	3
Introduction to Machine Learning	CMSC 422	3
Bioinformatic Algorithms, Databases and Tools	CMSC 423	3
Database Design	CMSC 424	3
Computer Vision	CMSC 426	3
Computer Graphics	CMSC 427	3
Introduction to Natural Language Processing	CMSC 470	3
Introduction to Data Visualization (Area 2 <b>OR</b> Area 3)	CMSC 471	3
Advanced Topics in Machine Learning (Fall 2018)	CMSC 498V	3
Advances in XR (Spring 2022)	CMSC 498F	3

<b>Area 3: Software Engineering and Programming Language</b>	<i>Course</i>	<i>Credits</i>
Introduction to Compilers	CMSC 430	3
Programming Language Technologies and Paradigms	CMSC 433	3
Introduction to Human-Computer Interaction	CMSC 434	3
Software Engineering	CMSC 435	3
Programming Handheld Systems	CMSC 436	3
Introduction to Data Visualization (Area 2 <b>OR</b> Area 3)	CMSC 471	3

<b>Area 4: Theory</b>	<i>Course</i>	<i>Credits</i>
Design and Analysis of Computer Algorithms	CMSC 451	3
Elementary Theory of Computation	CMSC 452	3
Algorithms for Data Science	CMSC 454	3
Cryptology	CMSC 456	3
Introduction to Quantum Computing	CMSC 457	3
Introduction to Computational Game Theory	CMSC 474	3

<b>Area 5: Numerical Analysis</b>	<i>Course</i>	<i>Credits</i>
Computational Methods	CMSC460	3
Introduction to Numerical Analysis	CMSC466	3

<b>Upper Level Electives</b>	<i>Course</i>	<i>Credits</i>
Introduction to Data Science	CMSC320	3
Introduction to PHP and Javascript (formerly CMSC398N)	CMSC335	3
Student Initiated Courses (STICs)	CMSC388/9	1-2
Teaching Techniques for Computer Science (TAs Only)	CMSC395	1
Computer Science Honors Seminar (Dept Honors Only)	CMSC396H	1
Game Programming	CMSC425	3
Introduction to Deep Learning	CMSC472	3
Capstone in Machine Learning	CMSC473	3
Combinatorics and Graph Theory	CMSC475	3
Robotics and Perception	CMSC476	3
Quantum Boot Camp	CMSC488A	1
Special Topics in CS Courses (not listed in a distributive area)	CMSC498	1-3
Independent Study	CMSC498A	1-3
Independent Undergraduate Research	CMSC499A	1-3