DEGREE REQUIREMENTS FOR CS MAJOR

Much of the knowledge at the early stage of the degree program is cumulative. To ensure that transfer students start with the appropriate courses, the department offers exemption exams for CMSC 131, 132, 216, and 250. Students who have had CS courses prior to starting at Maryland should schedule and take exemption exams.

A C- or better must be earned in all major requirements.

Required Lower Level Courses (Unless Exempt)

- MATH 140 (4) Calculus I
- MATH 141 (4) Calculus II
- CMSC 131 (4) Object-Oriented Programming I
- CMSC 132 (4) Object-Oriented Programming II
- CMSC 216 (4) Introduction to Computer Systems
- CMSC 250 (4) Discrete Structures

**Students may fulfill CMSC 131, 132, 216 or 250 course requirements by passing proficiency exams before they start here at UMD.

Additional Required Courses

- CMSC 330 (3) Organization of Programming Languages
- CMSC 351 (3) Algorithms
- STAT 4xx (3) This course must have prerequisite of MATH 141 or higher; cannot be cross-listed with CMSC. Examples for this could be STAT400, STAT410, etc.
- MATH/STAT xxx (3/4) This course must have prerequisite of MATH 141 or higher; cannot be cross-listed with CMSC. Examples for this could be MATH240, MATH241, STAT401, etc.

Upper Level Computer Science Courses

At the upper level, students take five (5) CMSC 400 level courses from at least three different areas with no more than two courses in a given area. An additional two (2) CMSC electives, totaling 6 credits, for the general computer science degree are also required. Students may take up to three 1 credit CS courses to fulfill the their elective credits requirement. If students take more than two courses from an area, the additional courses will be counted as upper level computer science electives. Students can also count one credit winter courses towards the elective requirement, as well as independent research or study with a faculty member, and other courses at the 300 or 400

level, including special topics courses.

Area 1: Systems
CMSC 411 (3) Computer Systems Architecture
CMSC 412 (4) Operating Systems
CMSC 414 (3) Computer and Network Security
CMSC 417 (3) Computer Networks
CMSC 498X (3) Introduction to Software-defined Radio and Wireless Communications (course will fulfill requirement for students who are enrolled the course in Fall 2018 *only*)
CMSC 498K (3) Big Data Systems (course will fulfill requirement for students who are enrolled in the course in Spring 2018 or Spring 2019 *only*)

Area 2: Information Processing
CMSC 420 (3) Data Structures
CMSC 421 (3) Introduction to Artificial Intelligence
CMSC 422 (3) Machine Learning
CMSC 423 (3) Bioinformatic Algorithms, Databases, and Tools
CMSC 424 (3) Database Design
CMSC 426 (3) Image Processing
CMSC 427 (3) Computer Graphics
CMSC 470 (3) Introduction to Natural Language Processing
CMSC 498V (3) Advanced Topics in Machine Learning (course will fulfill requirement students who are enrolled in the course in Fall 2018 *only*)

Area 3: Software Engineering and Programming Languages
CMSC 430 (3) Introduction to Compilers
CMSC 433 (3) Programming Language Technologies and Paradigms
CMSC 434 (3) Introduction to Human-Computer Interaction
CMSC 435 (3) Software Engineering
CMSC 436 (3) Hand Held Programming Devices

Area 4: Theory
CMSC 451 (3) Design and Analysis of Computer Algorithms
CMSC 452 (3) Elementary Theory of Computation
CMSC 456 (3) Cryptology

Area 5: Numerical Analysis (choose one)
CMSC 460 (3) Computational Methods (credit will only be given for CMSC 460 or CMSC 466)
CMSC 466 (3) Introduction to Numerical Analysis (credit will only be given for CMSC 466 or CMSC 460)

Upper Level Concentration Requirement
Students must also take at least 12 credits of 300-400 level courses from one discipline outside of CMSC. No course in or cross-listed with CMSC can be counted. An overall 2.0 average must be earned in these courses. Each course must be a minimum of 3 credits. Only 1 independent study or experiential learning course may be used. Some courses may not count towards the upper level concentration and it is recommended that you speak to an advisor regarding your interests.

Cybersecurity Specialization
Students looking to pursue the cybersecurity specialization are required to complete the lower level courses (MATH140, MATH141, CMSC131, CMSC132, CMSC216, CMSC250), the additional required courses (CMSC330, CMSC351, MATH/STATXXX and STAT4xx beyond MATH141), and the upper level concentration requirements as detailed above. The difference in the specialization is the upper level computer science courses.

Students are required to take:

CMSC412
CMSC414
CMSC417
CMSC433
CMSC456

Students must choose:
CMSC411 OR CMSC430 (may not take both to complete requirements)
and
CMSC420 OR CMSC451 (may not take both to complete requirements)

Data Science Specialization

Students looking to pursue the data science specialization are required to complete the lower level courses (MATH140, MATH141, CMSC131, CMSC132, CMSC216, CMSC250), the additional required courses (CMSC330, CMSC351, MATH/STATXXX beyond MATH141), and the upper level concentration requirements as detailed above. The difference in the specialization is the upper level computer science courses.

Students are required to take:
CMSC320
CMSC422 (requires MATH240 or MATH461 as a prerequisite)
CMSC424
STAT400

Students must choose one course from:
CMSC402
CMSC420
CMSC421
CMSC423
CMSC425
CMSC426
CMSC427

Students must choose one course from:
CMSC451
CMSC460
CMSC498U (course will fulfill requirement for students who are enrolled in the course in Spring 2018 or Spring 2019 *only*)

Students must choose two courses from:
CMSC411
CMSC412
CMSC414
CMSC417
CMSC430
CMSC433
CMSC434
CMSC435
CMSC498K (course will fulfill requirement for students who are enrolled in the course in Spring 2018 or Spring 2019 *only*)

Contact Our Office

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