### Department of Computer & Information Science - College of Engineering - UMass Dartmouth

**Requirements for Bachelor of Science in Computer Science with option in Software Engineering** *(updated: 6/6/2023 jm)*

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#### CIS Core Courses (Grade of "C" or better) - 43 Credits
- CIS 180 - Object-Oriented Programming I (4)
- CIS 181 - Object-Oriented Programming II (4) (Pre: CIS 180)
- CIS 190 - Introduction to Procedural Programming (4) (Pre: CIS 180)
- CIS 264 - Software Quality Assurance and Testing (3) (Pre: MTH 181)
- CIS 272 - Introduction to Computing Systems (4) (Co: CIS 190, MTH 181)
- CIS 280 - Software Specification and Design (4) (Pre: CIS 181)
- CIS 340 - Large Software Systems (3) (Pre: CIS 280)
- CIS 360 - Algorithms and Data Structures (4) (Pre: CIS 181, CIS 190, MTH 181)
- CIS 440 - Software Process and Project Management (3) (Pre: CIS Jr/Sr)
- CIS 461 - Formal Methods in Software Engineering (3) (Pre: MTH 182)
- CIS 498 - Software Engineering Project I (4) (Pre: CIS 280, CIS 362)
- CIS 499 - Software Engineering Project II (3) (Pre: CIS 498) - USC 5A + 5B

#### CIS Elective, 4 courses required (Grade of "C" or better) - Minimum 12 Credits
- CIS 402 – Special Topics in Computer & Information Science (3) (depends on topic)
- CIS 410 - Programming Language Design (3) (Pre: CIS 360)
- CIS 412 - Artificial Intelligence (3) (Pre: CIS 360)
- CIS 430 - Data Mining and Knowledge Discovery (3) (Pre: CIS 360)
- CIS 431 - Human Computer Interaction (3) (Pre: CIS 362)
- CIS 433 - Mobile Application Development with Android (3) (Pre: CIS 360)
- CIS 434 - Mobile Application Development with iOS (3) (Pre: CIS 360)
- CIS 442 – Digital Forensics (3) (Pre: CIS 360, CIS 370)
- CIS 443 – Applied Cryptography (3) (Pre: CIS 360)
- CIS 444 – Cyber Defense and Operations (3) (Pre: CIS 360)
- CIS 446 - Secure Software Development (3) (Pre: CIS 280)
- CIS 447 - Network Security & Data Assurance (3) (Pre: CIS 360)
- CIS 452 - Database Systems (3) (Pre: CIS 280)
- CIS 454 - Computer Graphics (3) (Pre: CIS Jr/Sr)
- CIS 455 - Bioinformatics (3) (Pre: CIS 360)
- CIS 463 - Game Engine Design (3) (Pre: CIS 360)
- CIS 464 - Computer Game Design (3) (Pre: CIS 280, MTH 154 or 152)
- CIS 465 - Topics in Computer Vision (3) (Pre: CIS 360)
- CIS 466 - Introduction to Mobile Robotics (3) (Pre: CIS 360)
- CIS 467 - Image Analysis and Processing (3) (Pre: CIS 360)
- CIS 468 - Data Visualization (3) (Pre: CIS 360)
- CIS 469 - Web Software Development (3) (Pre: CIS 360)
- CIS 471 - Compiler Design (3) (Pre: CIS 361)
- CIS 475 - Computer Networks (3) (Pre: CIS 370)
- CIS 476 - Network Programming (3) (Pre: CIS 370)
- CIS 477 - Computer and Information System Security (3) (Pre: CIS 360, CIS 370)
- CIS 481 - Parallel and Distributed Software Systems (3) (Pre: CIS 280, CIS 370)
- CIS 490 - Machine Learning (3) (Pre: CIS 360)

* A minimum 2.00 GPA in the major, a minimum 2.00 cumulative GPA, and a minimum 120 earned credits to graduate.

** USC - University Studies Cluster; A preapproved list can be found at: [http://www.umassd.edu/universitystudies/approvedcourses/](http://www.umassd.edu/universitystudies/approvedcourses/)

Note: Any CIS core course or technical elective that is a prerequisite to another CIS course, must be passed with a grade of C or better in order to satisfy the prerequisite.