### CIS Core Courses (Grade of "C" or better) - 45 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)
- CIS 272 - Introduction to Computing Systems (4) (Co: CIS 190, MTH 181)
- CIS 273 - Computer Organization and Design (4) (Pre: CIS 272)
- CIS 280 - Software Specification and Design (4) (Pre: CIS 181)
- CIS 360 - Algorithms and Data Structures (3) (Pre: CIS 181)
- CIS 361 - Models of Computation (3) (Pre: CIS 181, MTH 182)
- CIS 370 - Design of Operating Systems (4) (Pre: CIS 273)
- CIS 481 - Parallel and Distributed Software Systems (4) (Pre: CIS 280, CIS 370)
- CIS 498 - Software Engineering Project I (4) (Pre: CIS 280, CIS 362) - USC 5A
- CIS 499 - Software Engineering Project II (3) (Pre: CIS 498) - USC 5B

### CIS Elective, 4 courses required, (Grade of "C" or better) - Minimum 12 Credits

- CIS 314 - Computer Architecture (4) (Pre: CIS 273, CIS 360)
- CIS 365 - Software Process and Project Management (3) (Pre: CIS Jr/Sr)
- CIS 410 - Programming Language Design (3) (Pre: CIS 360)
- CIS 412 - Artificial Intelligence (3) (Pre: CIS 360)
- CIS 421 - Introduction to Theory of Computation (3) (Pre: CIS 361)
- CIS 422 - Design of Parallel Algorithms (4) (Pre: CIS 360)
- CIS 430 - Data Mining and Knowledge Discovery (3) (Pre: CIS 360)
- CIS 431 - Human Computer Interaction (4) (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 440 - Software Process and Project Management (3) (Pre: CIS Jr/Sr)
- CIS 452 - Database Systems (3) (Pre: CIS 362)
- CIS 454 - Computer Graphics (3) (Pre: CIS Jr/Sr)
- CIS 455 - Bioinformatics (3) (Pre: CIS 360, CIS 362)
- CIS 461 - Formal Methods in Software Engineering (3) (Pre: MTH 182, CIS 360)
- CIS 463 - Game Engine Design (3) (Pre: CIS Jr/Sr)
- CIS 464 - Computer Game Design (3) (Pre: CIS 360)
- 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 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 490 - Machine Learning (3) (Pre: CIS 360)

### Mathematics Requirements - 17 Credits

- MTH 153 (or MTH 151) - Calculus I (4) - USC 1D
- MTH 154 (or MTH 152) - Calculus II (4) (Pre: MTH 153 or 151)
- MTH 181 - Discrete Structures I (3)
- MTH 182 - Discrete Structures II (3) (Pre: MTH 181)
- MTH 331 - Probability (3) (Pre: MTH 112)

### Science/Quantitative Requirements - Minimum 14 Credits

- PHY 113 - BIO 121/131 - CHM 151/161 (4) (Circle one)
- PHY 114 - BIO 122/132 - CHM 152/162 (4) (Must be continuation of above)
- CIS 498 - Software Engineering Project I (4) (Pre: CIS 280, CIS 362) - USC 5A
- CIS 362 - Empirical Methods for Computer Science (3) (Pre: MTH 331)

### English Requirements/Foundations for Engagement - 9 Credits

- ENL 101 - Critical Writing and Reading I (3) - USC 1A
- ENL 102 - Critical Writing and Reading II (3) - USC 1B
- ENL 266 - Technical Communications (3) - USC 1C

### Ethics and Social Responsibility/Science in the Engaged Community - 3 Credits

- CIS 381 - Social and Ethical Aspects of Computing (3) - USC 2B

### University Studies** - 18 Credits

- CIS 111 or EGR 111 (3) - USC 1E
- Literature (3) - Choose from USC 3A
- Visual and Performing Arts (3) - Choose from USC 3B
- Human Questions and Contexts (3) - Choose from USC 4A
- Nature of US Society (3) - Choose from USC 4B
- Nature of the Global Society (3) - Choose from USC 4C

### Free Electives - A Single Class or Combination that adds up to 3 Credits

- (3)

### Comment Box

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*GPA of 2.0 or better to graduate

**USC - University Studies Cluster; A preapproved list can be found at: 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.