School of Computer Science

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Undergraduate Office: GHC 4115
https://www.csd.cs.cmu.edu/academics/undergraduate/overview

Carnegie Mellon founded one of the first Computer Science departments in the world in 1965. As research and teaching in computing grew at a tremendous pace at Carnegie Mellon, the university formed the School of Computer Science at the end of 1988. Carnegie Mellon was one of the first universities to elevate Computer Science into its own academic college at the same level as the Mellon College of Science and the College of Engineering. Today, the School of Computer Science consists of seven departments and institutes, including the Computer Science Department that started it all, along with the Human-Computer Interaction Institute, the Institute for Software Research, the Computational Biology Department, the Language Technologies Institute, the Machine Learning Department, and the Robotics Institute. Together, these units make the School of Computer Science a world leader in research and education.

The School of Computer Science offers the following majors and minors:

- B.S. in Computer Science
- B.S. in Computational Biology
- Bachelor's in Computer Science and Art (joint with the College of Fine Arts)
- Additional major in Computer Science
- Additional major in Human-Computer Interaction
- Additional major in Robotics
- Minor in Computer Science
- Minor in Computational Biology
- Minor in Human-Computer Interaction
- Minor in Language Technologies
- Minor in Machine Learning
- Minor in Neural Computation
- Minor in Robotics
- Minor in Software Engineering

Information for these majors and minors can be found through the navigation menu or through the links below:

- Computer Science (http://courselocal.git.cs.cmu.edu/schoolofcomputerscience/undergraduatecomputerscience) (B.S. degree, additional major, minor)
- Computational Biology (http://courselocal.git.cs.cmu.edu/schoolofcomputerscience/undergraduatecomputationalbiology) (B.S. degree, minor)
- Additional SCS majors and minors (http://courselocal.git.cs.cmu.edu/schoolofcomputerscience/addmajorsandminors)

Students who apply to, and are directly admitted into, the School of Computer Science can choose between two primary majors, Computer Science or Computational Biology. Students admitted into the School of Computer Science and the College of Fine Arts are also given the option to pursue a joint major in Computer Science and Art. Suitably prepared students from other Carnegie Mellon colleges are eligible to apply for internal transfer to the School of Computer Science and will be considered for transfer if grades in specific requirements are sufficiently high and space is available. Computation-oriented programs are also available within the Mellon College of Science, the Dietrich College of Humanities and Social Sciences, the College of Engineering and the College of Fine Arts.

SCS Policies & Procedures

School of Computer Science (SCS) Academic Standards and Actions

Grading Practices

Grades given to record academic performance in SCS are detailed under Grading Practices at http://courselocal.git.cs.cmu.edu/servicesandoptions/undergraduateacademicregulations/

Dean's List

SCS recognizes each semester those undergraduates who have earned outstanding academic records by naming them to the Dean's List. The criterion for such recognition is a quality point average of at least 3.75 while completing a minimum of 36 factorable units and earning no incomplete grades.

Academic Actions

In the first year, quality point averages below 1.75 in either semester invoke an academic action. For all subsequent semesters an academic action will be taken if the semester quality point average or the cumulative quality point average (excluding the first year) is below 2.00.

Probation: The action of probation will be taken in the following cases based on QPA:

1. One semester of the first year is below 1.75 QPA;
2. The semester QPA of a student in good standing beyond the first year falls below 2.00.

The term of probation is one semester as a full-time student. First year students are no longer on probation at the end of the second semester if the second semester’s QPA is 1.75 or above. Students in the third or subsequent semester of study are no longer on probation at the end of one semester if the semester QPA and cumulative QPA (excluding the first year) are 2.00 or above.

Probation Continued: A student who has had one semester on probation and is not yet meeting minimum requirements but whose record indicates that the standards are likely to be met at the end of the next semester of study is occasionally continued on probation. This action is normally taken only when a student’s semester QPA is above 2.0 but their cumulative QPA is not yet above 2.0.

Suspension: A student who does not meet minimum standards based on QPA at the end of one semester of probation will be suspended:

- A first year student will be suspended if the QPA from each semester is below 1.75.
- A student on probation in the third or subsequent semester of study will be suspended if the semester QPA is below 2.00.

The minimum period of suspension is one academic year (two non-summer semesters). At the end of that period a student may return to school (on probation) by:

1. completing a Return from Leave form from the HUB,
2. submitting an additional written statement to the SCS Assistant Dean for Undergraduate Education, minimum one page, that outlines what the student did while on leave to address the issues that led to the suspension and that would indicate future success on return, and
3. written approval from the student's academic advisor and the Assistant Dean for Undergraduate Education, in consultation with the Office of Student Affairs and the Office of International Education as appropriate.

Students who have been suspended or have withdrawn are required to absent themselves from the campus (including residence halls and Greek houses) within a maximum of two days after the action and to remain off the campus for the duration of the time specified. This action includes debarment from part-time or summer courses at the university for the duration of the period of the action. Although suspended students may not hold student jobs, students on academic suspension may, under certain circumstances, have a non-student job with the university. Students on disciplinary or administrative suspension may not.

Drop: This is a permanent severance. Students who have been suspended and who fail to meet minimum standards in the semester that they return to school will be dropped.

Students who have been dropped are required to absent themselves from the campus (including residence halls and Greek houses) within a maximum of two days after the action.

Other Actions: In addition to academic actions based on QPA, the Associate Dean for Undergraduate Education may place students on probation, or subsequent suspension, if they do not demonstrate reasonable progress through the core CS curriculum (e.g., not completing a CS core class after 3 attempts, or not completing the required CS 100-level core courses by the end of the sophomore year). Students are encouraged to consult with their academic advisor about any concerns with regard to lack of progress in the CS major.

The relation indicated above between probation, suspension and drop is nominal. In unusual circumstances, SCS College Council may suspend or drop a student without prior probation.
Return from Leave of Absence

SCS undergraduate students returning from a leave of absence are required to submit a Return from Leave of Absence form to the SCS Undergraduate Office for approval by the student’s academic advisor and the SCS Assistant Dean for Undergraduate Education. In addition, the student must also supply a letter that explains the reason for the leave, the actions that were performed during the leave to prepare the student for a successful return, and a description of the on-campus resources, if required, that would be used by the student in order to increase the likelihood of success. Students returning from a leave are also encouraged to provide two letters of support from people close to the student (e.g., family, friends, clergy, teachers, coaches, others as appropriate). Requests to return are reviewed by the student’s academic advisor, the Assistant Dean and the Student Affairs liaison to determine eligibility and any resources that need to be put into place to assist the student upon return. Contact the SCS Undergraduate Office for more information.

Transfer into SCS / CS Dual-degree

Undergraduate students admitted to colleges at CMU other than SCS and wishing to transfer to Computer Science or pursue a dual degree in Computer Science should consult with the SCS Assistant Dean for Undergraduate Education during their first year. Students wishing to transfer to Computational Biology or pursue a dual degree in Computational Biology should consult with the Assistant Department Head for Education in the Computational Biology Department during their first year. See the individual program pages for Computer Science (http://coursecatalog.web.cmu.edu/schoolofcomputerscience/undergraduatecomputerscience) and Computational Biology (http://coursecatalog.web.cmu.edu/schoolofcomputerscience/undergraduatecomputationalbiology) for locations.

- For the Computer Science major, students must complete 21-127 (or equivalent), 15-122, 15-150, 15-210, 15-213, 15-251 with an overall QPA over these six courses of 3.6 or higher and an overall QPA of at least 3.0 in order to apply for transfer or dual degree.
- For the Computational Biology major, students must complete 21-127 (or equivalent), 15-122, 15-251, 15-351 (or 15-210*), 03-121 and 02-250 with an overall QPA over these six courses of 3.6 or higher and an overall QPA of at least 3.0 in order to apply for transfer or dual degree. (*Students who take 15-210 will need to also take 15-150; this course is not required for the B.S. in Computational Biology but can count as an elective.)

Students may apply for transfer by the mid-semester break in the semester when the last of the six required courses will be completed. In the case of courses in progress, the mid-semester grades will be used in the QPA calculation. The decision to allow transfer or dual degree will be made by committee based on the student’s academic performance (in the specified courses and in their courses overall if necessary), additional involvement in SCS and other computing-related activities, and availability of space in the student’s class schedule. Students should consult the SCS Undergraduate Program office for comprehensive information concerning minimum requirements, instructions, and deadlines.

Procedure for transfer of students from another university into SCS: A student should first apply through the Office of Admission. If the Office of Admission believes the applicant is acceptable, the student’s record is sent to SCS for evaluation. Admission is based on seat availability, overall academic performance from the student’s current institution, and the application material. It is important to note that extremely few external transfers are admitted to the SCS program at Carnegie Mellon University.

Graduation Requirements

1. A requirement for graduation is the completion of the program specified for a degree with a cumulative quality point average of 2.00 or higher for all courses taken after the first year.
2. Students must be recommended for a degree by the faculty of SCS.
3. A candidate for the bachelor’s degree must complete at the University a minimum of four semesters of full-time study, or the equivalent of part-time study, comprising at least 180 units of course work.
4. Students will be required to have met all financial obligations to the university before being awarded a degree.

Modification of Graduation Requirements: A student may seek permission to modify graduation requirements by petition to the SCS College Council.

General Education Requirements

Science and Engineering

See the individual program pages for Computer Science (http://coursecatalog.web.cmu.edu/schoolofcomputerscience/undergraduatecomputerscience) and Computational Biology (http://coursecatalog.web.cmu.edu/schoolofcomputerscience/undergraduatecomputationalbiology) for general education requirements in the fields of science and engineering.

Humanities and Arts

All candidates for a B.S. degree in the School of Computer Science must complete a minimum of 63 units offered by the College of Humanities & Social Sciences and/or the College of Fine Arts as prescribed below. Students pursuing a Bachelor's in Computer Science and Art (http://coursecatalog.web.cmu.edu/servicesandoptions/intercollegeprograms/bxaintercollege#bcsacurriculumtext) should consult the general education requirements for that program.

A. Writing Requirement (9 units)

Complete the following course:
76-101 Interpretation and Argument 9
(or 76-102 Advanced First Year Writing, by invitation only)

B. Breadth Requirement (minimum 27 units: 9 units each)
Complete three courses, one each from Category 1, Category 2, and Category 3:

1. Category 1: Cognition, Choice and Behavior - this requirement explores the process of thinking, decision making, and behavior in the context of the individual.
   - 70-311 Organizational Behavior 9
   - 80-130 Introduction to Ethics 9
   - 80-150 Nature of Reason 9
   - 80-180 Nature of Language 9
   - 80-221 Philosophy of Social Science 9
   - 80-230 Ethical Theory 9
   - 80-241 Ethical Judgments in Professional Life 9
   - 80-242 Conflict and Dispute Resolution 9
   - 80-270 Philosophy of Mind 9
   - 80-271 Philosophy and Psychology 9
   - 80-275 Metaphysics 9
   - 80-281 Language and Thought 9
   - 85-102 Introduction to Psychology 9
   - 85-211 Cognitive Psychology 9
   - 85-221 Principles of Child Development 9
   - 85-241 Social Psychology 9
   - 85-251 Personality 9
   - 85-261 Abnormal Psychology 9
   - 88-120 Reason, Passion and Cognition 9
   - 88-260 Organizations 9

2. Category 2: Economic, Political and Social Institutions - this requirement focuses on institutions and their impact on society.
   - 80-130 Introduction to Ethics 9
   - 80-150 Nature of Reason 9
   - 80-180 Nature of Language 9
   - 80-221 Philosophy of Social Science 9
   - 80-230 Ethical Theory 9
   - 80-241 Ethical Judgments in Professional Life 9
   - 80-242 Conflict and Dispute Resolution 9
   - 80-270 Philosophy of Mind 9
   - 80-271 Philosophy and Psychology 9
   - 80-275 Metaphysics 9
   - 80-281 Language and Thought 9
   - 85-102 Introduction to Psychology 9
   - 85-211 Cognitive Psychology 9
   - 85-221 Principles of Child Development 9
   - 85-241 Social Psychology 9
   - 85-251 Personality 9
   - 85-261 Abnormal Psychology 9
   - 88-120 Reason, Passion and Cognition 9
   - 88-260 Organizations 9

3. Category 3: Core Knowledge - this requirement is designed for students who wish to develop a broad understanding of the world.
   - 85-102 Introduction to Psychology 9
   - 85-211 Cognitive Psychology 9
   - 85-221 Principles of Child Development 9
   - 85-241 Social Psychology 9
   - 85-251 Personality 9
   - 85-261 Abnormal Psychology 9
   - 88-120 Reason, Passion and Cognition 9
   - 88-260 Organizations 9

Category 4: Economic, Political and Social Institutions - this requirement focuses on the relationship between individuals and institutions.
   - 80-130 Introduction to Ethics 9
   - 80-150 Nature of Reason 9
   - 80-180 Nature of Language 9
   - 80-221 Philosophy of Social Science 9
   - 80-230 Ethical Theory 9
   - 80-241 Ethical Judgments in Professional Life 9
   - 80-242 Conflict and Dispute Resolution 9
   - 80-270 Philosophy of Mind 9
   - 80-271 Philosophy and Psychology 9
   - 80-275 Metaphysics 9
   - 80-281 Language and Thought 9
   - 85-102 Introduction to Psychology 9
   - 85-211 Cognitive Psychology 9
   - 85-221 Principles of Child Development 9
   - 85-241 Social Psychology 9
   - 85-251 Personality 9
   - 85-261 Abnormal Psychology 9
   - 88-120 Reason, Passion and Cognition 9
   - 88-260 Organizations 9
Category 3: Cultural Analysis - this requirement seeks to recognize cultures that have shaped and continue to shape the human experience; courses in this category are usually either broad in place, time, or cultural diversity.

57-173 Survey of Western Music History 9
60-205 Critical Theory in Art III 9
70-342 Managing Across Cultures 9
76-221 Books You Should Have Read By Now 9
76-227 Comedy 9
76-232 Introduction to African American Literature 9
76-239 Introduction to Film Studies 9
76-241 Introduction to Gender Studies 9
79-104 Global Histories 9
79-201 Introduction to Anthropology 9
79-202 Flesh and Spirit: Early Modern Europe, 1400-1750 9
79-207 Development of European Culture 9
79-222 Between Revolutions: The Development of Modern Latin America 9
79-226 African History: Earliest Times to 1780 9
79-229 Origins of the Arab-Israeli Conflict, 1880-1948 9
79-230 Arab-Israeli Conflict and Peace Process since 1948 9
79-240 Development of American Culture 9
79-241 African American History: Africa to the Civil War 9
79-242 African American History: Reconstruction to the Present 9
79-255 Irish History 9
79-261 The Last Emperors: Chinese History and Society, 1600-1900 9
79-262 Modern China: From the Birth of Mao ... to Now 9
79-265 Russian History: From the First to the Last Tsar 9
79-282 Europe and the World since 1800 9
79-316 Photography, the First 100 Years, 1839-1939 9
79-345 Roots of Rock & Roll 9
79-350 Early Christianity 9
79-395 The Arts in Pittsburgh 9
79-396 Music and Society in 19th and 20th Century Europe and the U.S. 9
80-100 Introduction to Philosophy 9
80-250 Ancient Philosophy 9
80-251 Modern Philosophy 9
80-253 Continental Philosophy 9
80-254 Analytic Philosophy 9
80-255 Pragmatism 9
80-261 Empiricism and Rationalism 9
80-276 Philosophy of Religion 9
82-273 Introduction to Japanese Language and Culture 9
82-293 Introduction to Russian Culture 9
82-303 Introduction to French Culture 9
82-304 The Francophone World 9
82-327 The Emergence of the German Speaking World 9
82-333 Introduction to Chinese Language and Culture 9
82-342 Spain: Language and Culture 9
82-343 Latin America: Language and Culture 9
82-344 U.S. Latinos: Language and Culture 9
82-345 Introduction to Hispanic Literary and Cultural Studies 9

C. Humanities and Arts Electives (minimum 27 units)

Complete 3 non-technical courses of at least 9 units each from any of the departments in the College of Humanities & Social Sciences or the College of Fine Arts. Some of the courses taught in these units are considered technical courses and may not be used to satisfy this requirement (see Additions below). Additionally, a select set of courses from Business Administration and from Environmental and Public Policy can also count for this requirement (see Additions below). Students may combine humanities/arts courses with lower units together to form a single course of 9 units or more. Students are encouraged, but not required, to take courses from different departments to gain additional breadth and to create new opportunities for engagement with the university community.

The most up-to-date list of additions and deletions can be found at http://www.csd.cs.cmu.edu/content/bscs-humanities-and-arts-requirements and http://www.cs.cmu.edu/content/bscs-humanities-and-arts-requirements and supersedes the lists given below. Consult with a CS undergraduate advisor for additional information.

Deletions

The following courses may not count toward the Humanities and Arts requirement in SCS due to the technical (computing and/or mathematical) nature of the courses:
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67-240 Mobile Web Design & Development 9
67-250 The Information Systems Milieux 9
67-260 Visualizing Complex Information 6
67-262 Database Design and Development 9
67-265 Design Fundamentals I: Shaping Interactions and Experiences 9
67-272 Application Design and Development 9
67-279 Introduction to Geographical Information Systems 6
67-280 Special Topics: Information System Security 9
67-300 Special Topics: Search Engines 6
67-301 Networks and Telecommunications 9
67-304 Database Design and Implementation 6
67-306 Special Topics: Management of Computer and Information Systems 9
67-308 Innovation Studio: Health Care Information Systems 9
67-309 Special Topics 6
67-311 Database Design and Implementation 9
67-312 Strategic Information Systems Management 9
67-313 Special Topics: Information Technology Audits and Controls 8
67-315 Interaction Design for the Web 9
67-316 Human Computer Interface Design and Testing 9
67-317 Mobile Web Development and Usability Testing 9
67-318 Business Process Modeling and Implementation 9
67-319 Global Technology Consulting Groundwork 3
67-321 Social Informatics 6
67-324 Accelerating Innovation and Entrepreneurship 9
67-327 Web Application Security 6
67-328 Mobile to Cloud: Building Distributed Applications 9
67-329 Contemporary Themes in Global Systems 9
67-330 Technology Consulting in the Community 9
67-331 Technology Consulting in the Global Community 3
67-344 Organizational Intelligence in the Information Age 9
67-352 Electronic Business 9
67-353 IT & Environmental Sustainability 6
67-354 Information Systems and Sustainability 9
67-356 Design for Behavioral Change 9
67-357 Healthcare Analytics and Big Data 9
67-358 Technologies in Service Design 9
67-359 Design Fundamentals II 9
67-360 Applied Analytics 9
67-361 Big Data & Sustainability 6
67-362 Big Data and Analytics 9
67-364 Practical Data Science 9
67-370 Intelligent Decision Support Systems 9
67-371 Fundamentals of System Development 9
67-372 Principles of Database Systems 9
67-373 Software Development Project 12
67-379 Principles of Geographic Information Systems 9
67-381 The Designed World 9
67-390 Independent Study in Information Systems Var.
67-440 iDeaTe Mobile Application Design & Development 9
67-442 Mobile Application Development in IOS 9
67-474 Tech Startup Launchpad 9
67-475 Innovation in Information Systems 12
67-490 Practicum in Information Systems Var.
73-230 Intermediate Microeconomics 9
73-240 Intermediate Macroeconomics 9
73-274 Econometrics I 9
73-347 Game Theory for Economists 9
73-374 Econometrics II 9
76-388 Topics in Digital Humanities: Coding for Humanities 9
76-481 Introduction to Multimedia Design 12
76-487 Web Design 12
80-110 Nature of Mathematical Reasoning 9
80-210 Logic and Proofs 9
80-211 Logic and Mathematical Inquiry 9
80-212 Arguments and Logical Analysis 9
80-222 Measurement and Methodology 9
80-223 Causality and Probability 9
80-310 Formal Logic 9
80-311 Undecidability and Incompleteness 9
80-314 Logic and Artificial Intelligence 9
80-315 Modal Logic 9
80-316 Causation Probability & AI 9
80-405 Game Theory 9
80-411 Proof Theory 9
80-413 Category Theory 9
80-414 Seminar on Computability 9
80-521 Seminar on Formal Epistemology Var.
85-213 Human Information Processing and Artificial Intelligence 9
85-219 Biological Foundations of Behavior 9
85-370 Perception 9
85-414 Cognitive Neuropsychology 9
88-251 Empirical Research Methods 9
88-316 Game Theory 9

Additions

The following courses outside of Dietrich College and the College of Fine Arts may count toward the Humanities and Arts requirement in SCS:

08-532 Law of Computer Technology 9
08-533 Privacy Policy, Technology and Law 9
19-101 Introduction to Engineering and Public Policy 12
19-402 Telecommunications Technology, Policy & Management 12
19-403 Policies of Wireless Systems 12
19-411 Global Competitiveness: Firms, Nations and Technological Change 9
32-102 Seapower and Maritime Affairs 6
32-201 Leadership & Management 9
32-402 Leadership and Ethics 9
70-160 Graphic Media Management 9
70-311 Organizational Behavior 9
70-321 Negotiation and Conflict Resolution 9
70-332 Business, Society and Ethics 9
70-340 Business Communications 9
70-341 Organizational Communication 9
70-342 Managing Across Cultures 9
70-345 Business Presentations 9
70-350 Acting for Business 9
70-364 Business Law 9
70-365 International Trade and International Law 9
70-381 Marketing I 9
70-430 International Management 9
99-238 Materials, Energy and Environment 9

Faculty

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