

SCS General Education

General Education Requirements

All undergraduate degrees in the School of Computer Science include depth in their particular field of study but also breadth through the general education requirements. General education requirements are part of SCS degrees to give students an opportunity to learn more about the world from scientific and humanistic points of view. These additional skills are useful for graduates since computing is often embedded in domains that are not entirely within the bounds of computing. SCS students will need to use their computing skills to solve problems alongside scientists and engineers, artists, social and cognitive scientists, historians, linguists, economists and business experts, and SCS students will need to communicate effectively and understand the ethical implications of their work. The general education requirements help SCS students gain this broad perspective so they can work well in a wide variety of domains.

Science and Engineering

All candidates for a B.S. degree in the School of Computer Science must complete a minimum of 36 units offered by the Mellon College of Science and/or the College of Engineering (CIT). This includes at least four undergraduate courses in science and engineering, 9 units or more for each course, where at least one course must have a laboratory component and at least two courses must be from the same department. The School of Computer Science maintains a separate up-to-date list of approved science and engineering courses (<https://www.cs.cmu.edu/education/undergraduate/science-and-engineering-reqs1>). This catalog page lists the courses approved as of July 2026.

For Computational Biology majors, consult the Computational Biology (<http://coursecatalog.web.cmu.edu/schools-colleges/schoolofcomputerscience/undergraduatecomputationalbiology/>) program page for specific science and engineering requirements. The required science and engineering courses for the Computational Biology major also satisfy the General Education requirement for SCS by default.

For all other SCS majors, courses for this requirement come from these CIT and MCS departments at Carnegie Mellon University:

- Biology [03-xxx]
- Biomedical Engineering [42-xxx]
- Chemical Engineering [06-xxx]
- Chemistry [09-xxx]
- Civil and Environmental Engineering [12-xxx]
- Electrical and Computer Engineering [18-xxx]
- Materials Science and Engineering [27-xxx]
- Mechanical Engineering [24-xxx]
- Physics [33-xxx]

Laboratory Requirement

Courses meeting the laboratory requirement for Science and Engineering include:

02-261	Quantitative Cell and Molecular Biology Laboratory (can be paired with a course in Biology 03-xxx for two courses in one department)	9
02-262	Computation and Biology Integrated Research Lab (can be paired with a course in Biology 03-xxx for two courses in one department)	Var.
03-118	Beer: A Yeast's Perspective (can be paired with another 3+ unit course to satisfy one science/engineering elective requirement)	6
03-124	Modern Biology Laboratory	9
03-206	Biomedical Engineering Laboratory	9
09-101	Introduction to Experimental Chemistry (This 3 unit lab together with 09-105 satisfies the lab requirement.)	3
09-221	Laboratory I: Introduction to Chemical Analysis	12
27-100	Engineering the Materials of the Future	12
33-104	Experimental Physics	9
33-228	Electronics I	10
42-203	Biomedical Engineering Laboratory	9

85-310	Research Methods in Cognitive Psychology	9
85-370	Cognitive Neuropsychology Research Methods	9

Deletions

Some courses from the Mellon College of Science or the College of Engineering may not count toward Science and Engineering due to the technical (computing and/or mathematical) nature of the courses or due to the level of presentation. Any MCS or CIT courses that are cross-listed with SCS courses cannot be used for this requirement. Courses from Engineering & Public Policy [19-xxx] cannot be used except those listed under Additions (see below). All courses in MCS and CIT that are affiliated with the IDEATe program cannot be used for this requirement.

Along with the constraints above, the following courses cannot be used for this requirement:

03-511	Computational Molecular Biology and Genomics	9
04-330	Fundamentals of Software Development and Problem Solving	12
06-262	Mathematical Methods of Chemical Engineering	9
09-103	Atoms, Molecules and Chemical Change	9
09-108	The Illusion and Magic of Food	6
09-109	Kitchen Chemistry Sessions	3
09-110	The Design and Making of Skin and Hair Products	3
09-114	Basics of Food Science	3
09-204	Professional Communication Skills in Chemistry	3
09-209	Kitchen Chemistry Sessions	3
09-231	Mathematical Methods for Chemists	9
09-291	Environmental Systems on a Changing Planet	9
12-215	Introduction to Professional Writing in CEE	9
12-271	Computation and Data Science for Civil & Environmental Engineering	9
18-200	ECE Sophomore Seminar	1
18-202	Mathematical Foundations of Electrical Engineering	12
18-213	Introduction to Computer Systems	12
18-330	Introduction to Computer Security	12
18-334	Network Security	12
18-335	Secure Software Systems	12
18-341	Logic Design and Verification	12
18-344	Computer Systems and the Hardware-Software Interface	12
18-349	Introduction to Embedded Systems	12
18-384	Ethics and Policy Issues in Computing	9
18-441	Computer Networks	12
18-447	Introduction to Computer Architecture	12
18-460	Optimization	12
18-461	Introduction to Machine Learning for Engineers	12
18-462	Principles and Engineering Applications of AI	12
18-465	Advanced Probability & Statistics for Engineers	12
18-540	Rapid Prototyping of Computer Systems	12
24-214	IDEATe Special Topics: Mazes	9
24-215	IDEATe Special Topics: Smart Furniture	9
24-280	Special Topics: C++ Programming for Engineers	9
24-281	Introduction to Scientific Computing	2
24-311	Numerical Methods	10
27-410	Computational Techniques in Engineering	12
33-100	Basic Experimental Physics	6
33-115	Physics for Future Presidents	9
33-124	Introduction to Astronomy	9
33-231	Physical Analysis	10
33-232	Mathematical Methods of Physics	10
38-402	MCS Leadership Development Seminar	9
39-402	Leadership Development Seminar	9
42-201	Professional Issues in Biomedical Engineering	3
49-300	Integrated Product Conceptualization	12

Additions

The following additional courses have been approved for Science and Engineering:

02-261	Quantitative Cell and Molecular Biology Laboratory	Var.
02-262	Computation and Biology Integrated Research Lab	Var.
19-429	Climate Change Science and Solutions	9
19-440	Combustion and Air Pollution Control	9
85-170	Foundations of Brain and Behavior	9
85-310	Research Methods in Cognitive Psychology	9
85-314	Cognitive Neuroscience Research Methods	9
85-370	Cognitive Neuropsychology Research Methods	9
85-472	Cognitive Neuropsychology	9

New Courses

In the event that a new course is taught in MCS or CIT, consult with an advisor before taking the course. Your academic advisor will notify the SCS General Education Committee who will review the request and make adjustments to the academic audit if approved. Courses are reviewed based on the constraints given above.

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 Dietrich College of Humanities & Social Sciences (DC) and the College of Fine Arts (CFA). In addition, select courses from the Tepper School of Business (TSB) may also count toward this requirement, as indicated below. Students pursuing a Bachelor's in Computer Science and Art (<http://coursecatalog.web.cmu.edu/intercollegeprograms/bxaintercollege/#bcscurriculumtext>) should consult the general education requirements for that program. The School of Computer Science maintains a separate up-to-date list of approved humanities and arts courses for each of the requirements below (<https://www.cs.cmu.edu/education/undergraduate/humanities-and-arts-requirements>). This catalog page lists the courses approved as of July 2026.

Courses for this requirement come from these schools, departments and institutes at Carnegie Mellon University:

- Architecture [48-xxx]
- Business Administration [70-xxx]
- Design [51-xxx]
- Drama [54-xxx]
- English [76-xxx]
- Fine Arts [60-xxx and 62-xxx]
- History [79-xxx]
- Languages, Cultures and Applied Linguistics [82-xxx]
- Music [57-xxx]
- Philosophy [80-xxx]
- Psychology [85-xxx]
- Social and Decision Sciences [88-xxx]
- Strategy and Technology [84-xxx]

A. First Year Writing Requirement (9 units)

Complete one of the following writing options for 9 units:

76-101	Interpretation and Argument	9
76-102	Advanced First Year Writing: Special Topics (by invitation only)	9

or two of these three writing minis for 9 units total:

76-106	Writing about Literature, Art and Culture	4.5
76-107	Writing about Data	4.5
76-108	Writing about Public Problems	4.5

B. Breadth Requirement (minimum 27 units: 9 units each)

Complete three courses, one each from Category 1, Category 2, and Category 3. **Artificial Intelligence majors replace Category 1 with Category 1A: Cognitive Studies which is a subset of Category 1.** Human-Computer Interaction majors satisfy Category 1 with their required Psychology elective.

Category 1 (for all SCS majors except Artificial Intelligence): 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
70-318	Managing Effective Work Teams	9
70-385	Consumer Behavior	9
80-101	Dangerous Ideas in Science and Society	9
80-130	Introduction to Ethics	9
80-150	Nature of Reason	9
80-180	Introduction to Linguistics	9
80-221	Philosophy of Social Science	9
80-252	Kant	9
80-270	Problems of Mind and Body: Meaning and Doing	9
80-271	Mind and Body: The Objective and the Subjective	9
80-275	Metaphysics	9
80-330	Ethical Theory	9
85-100	Introduction to Psychology	9
85-106	Animal Minds	9
85-107	The Psychology of Video Games	9
85-110	Cognitive Psychology	9
85-130	Developmental Psychology	9
85-150	Social Psychology	9
85-190	Psychopathology	9
85-213	Human Information Processing and Artificial Intelligence	9
85-251	Personality	9
85-413	Perception	9
85-421	Language and Thought	9
88-120	Reason, Passion and Cognition	9
88-230	Human Intelligence and Human Stupidity	9
88-231	Thinking in Person vs. Thinking Online	9

Category 1A (for Artificial Intelligence majors): Cognitive Studies - this requirement explores how the brain and the mind work.

85-110	Cognitive Psychology	9
85-213	Human Information Processing and Artificial Intelligence	9
85-408	Visual Cognition	9
85-413	Perception	9
85-421	Language and Thought	9

Category 2 (all SCS majors): Economic, Political and Social Institutions - this requirement explores the processes by which institutions organize individual preferences and actions into collective outcomes.

19-101	Introduction to Engineering and Public Policy	12
36-303	Sampling, Survey and Society	9
66-221	Topics of Law: Introduction to Intellectual Property Law	9
70-332	Business, Society and Ethics	9
70-364	Business Law	9
73-102	Principles of Microeconomics	9
73-103	Principles of Macroeconomics	9
73-104	Principles of Microeconomics Accelerated	9
73-230	Intermediate Microeconomics	9
73-240	Intermediate Macroeconomics	9
73-369	Islamic Economics	9
76-425	Rhetoric, Science, and the Public Sphere	9
79-101	Making History: How to Think About the Past (and Present)	9
79-155	Introduction to African American Studies	9
79-160	Introduction to the History of Science	9
79-189	Democracy and History: Thinking Beyond the Self	9
79-212	Jim Crow America	9
79-237	Comparative Slavery	9
79-246	War, Genocide, and Gender in Modern Europe	9
79-248	U.S. Constitution & the Presidency	9
79-253	Imperialism and Decolonization in South Asia	9
79-255	Modern Ireland: Politics and Culture from the Famine (1847) to Today	9

79-270	Anti-Semitism Then and Now: Perspectives from the Middle Ages to the Present	9	76-357	(Im)Migration, Multilingualism, and Identities	9
79-275	Introduction to Global Studies	9	76-386	Language & Culture	9
79-300	History of U.S. Immigration Policy	9	79-104	Global Histories	9
79-304	History of Eugenics and Scientific Racism	9	79-201	Introduction to Anthropology	9
79-315	The Politics of Water in Global Perspective	9	79-202	Flesh and Spirit: Early Modern Europe, 1400-1750	9
79-320	Women, Politics, and Protest	9	79-211	Modern Southeast Asia: Colonialism, Capitalism, and Cultural Exchange	9
79-321	Documenting Human Rights	9	79-223	Mexico: From the Aztec Empire to the Drug War	9
79-330	Medicine and Society: Health, Healers, and Hospitals	9	79-226	African History: Earliest Times to 1780	9
79-331	Body Politics: Women and Health in America	9	79-229	The Origins of the Palestinian-Israeli Conflict, 1880-1948	9
79-370	Technology in the United States	9	79-230	The Arab-Israeli Conflict and Peace Process Through 1948 to Present	9
79-380	Hostile Environments: The Politics of Pollution in Global Perspective	9	79-234	Technology and Society	9
79-383	The History of Capitalism	9	79-240	U.S. History and Culture	9
79-391	Nations and Nationalisms in South Asia	9	79-242	African American History: Reconstruction to the Present	9
79-392	Europe and the Islamic World	9	79-245	Capitalism and Individualism in American Culture	9
80-135	Introduction to Political Philosophy	9	79-261	The Last Emperors: Chinese History and Society, 1600-1900	9
80-136	Social Structure, Public Policy & Ethics	9	79-262	Modern China: From the Birth of Mao ... to Now	9
80-244	Environmental Ethics	9	79-265	Russian History: Game of Thrones	9
80-245	Medical Ethics	9	79-281	Introduction to Religion	9
80-324	Philosophy of Economics	9	79-288	Bananas, Baseball, and Borders: Latin America and the United States	9
80-334	Social and Political Philosophy	9	79-293	Inward Odyssey	9
80-335	Social and Political Philosophy	9	79-316	Photography, the First 100 Years, 1839-1939	9
80-348	Health, Human Rights, and International Development	9	79-329	Introduction to Queer Studies	9
84-104	Decision Processes in American Political Institutions	9	79-345	Roots of Rock & Roll	9
84-110	The Economics of Politics and Technology	9	79-350	Early Christianity	9
84-226	International Relations	9	79-361	Nation, Culture, and Society in South Asian Cinema	9
84-275	Comparative Politics	9	79-378	Gender in South Asia	9
84-306	Latin American Politics	9	79-393	Institutions of the Roman Church	9
84-309	American Political Divides and Great Debates	9	79-395	The Arts in Pittsburgh	9
84-322	Nonviolent Conflict and Revolution	9	79-396	Music, Art, and Society in 19th and 20th Century Europe and the U.S.	9
84-324	The Future of Democracy	9	79-465	The Arts in Qatar	9
84-325	Contemporary American Foreign Policy	9	80-100	Introduction to Philosophy	9
84-352	Representation and Voting Rights	9	80-250	Ancient Philosophy	9
84-362	Diplomacy and Statecraft	9	80-251	Modern Philosophy	9
84-365	The Politics of Fake News and Misinformation	9	80-253	Continental Philosophy	9
84-380	US Grand Strategy	9	80-254	The History of Analytic Philosophy and Its Influence	9
84-386	The Privatization of Force	9	80-255	Pragmatism: Scientific Approach to Philosophy	9
84-387	Remote Systems and the Cyber Domain in Conflict	9	80-261	Experience, Reason, and Truth	9
84-389	Terrorism and Insurgency	9	80-276	Philosophy of Religion	9
84-390	Social Media, Technology, and Conflict	9	82-119	Arabic Calligraphy Culture & Skills	9
84-393	The US Congress: Legislative Progress or Paralysis?	9	82-137	Chinese Calligraphy: Culture and Skills	9
84-402	Judicial Politics and Behavior	9	82-139	Chinese Learning Through Cultural Practices and Community Engagement	9
84-405	The Future of Warfare	9	82-179	Multicultural Japan	9
88-234	Negotiation: International Focus	9	82-195	20th Century Eastern & Western Europe Through Masterpieces of Lit and Film	9
88-255	Strategic Decision Making	9	82-235	Fables, Legends and Stories from Ancient Chinese Civilization	9
88-281	Topics in Law: 1st Amendment	9	82-267	Beyond the Mafia and Michelangelo	9
88-284	Topics of Law: The Bill of Rights	9	82-268	Introduction to Italian Film	Var.
Category 3 (all SCS majors): 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.			82-273	Introduction to Japanese Language and Culture	9
48-240	History of World Architecture, I	9	82-278	Japanese Film and Literature: The Art of Storytelling	9
48-241	Modern Architecture: History & Theory	9	82-279	Anime - Visual Interplay between Japan and the World	9
57-173	Survey of Western Music History	9	82-280	Bilingual & Bicultural Experiences in the US	9
60-105	Cultural History of the Visual Arts	9	82-282	Interpreting Global Texts & Cultures	9
60-106	Cultural History of the Visual Arts - the Modern Period	9	82-283	Language Diversity & Cultural Identity	9
62-371	Photography, The First 100 Years, 1839-1939	9	82-286	Of Minorities and Migrants: Exploring Germany from the Margins Germany Today	9
70-342	Managing Across Cultures	9	82-293	Russian Cinema: From the Bolshevik Revolution to Putin's Russia	9
70-348	Cross-Cultural Business Communications	9			
76-221	Books You Should Have Read By Now	9			
76-230	Literature & Culture in the 19th Century	9			
76-239	Introduction to Film Studies	9			
76-241	Introduction to Gender Studies	9			

82-294	19th Century Russian Masterpieces	9
82-303	French & Francophone Cultures	9
82-304	French & Francophone Sociolinguistics	9
82-313	Topics in Modern Arabic: Contemporary Arab Cinema	9
82-314	Literature of the Arabic-speaking World	9
82-323	Germany, Austria and Switzerland in the 20th Century	9
82-327	The Emergence of the German Speaking World	9
82-331	Advanced Chinese I: Population, Youth, Marriage and Housing	9
82-333	Introduction to Chinese Language and Culture	9
82-342	Cultures of Spain	9
82-343	Cultures of Latin America	9
82-344	U.S. Latine Cultures	9
82-345	Using Spanish in Social Contexts	9
82-436	Introduction to Classical Chinese	9

C. Humanities and Arts Electives (minimum 27 units)

Complete 3 non-technical undergraduate courses of at least 9 units each from any of the departments in the Dietrich 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 Deletions below). Additionally, a select set of courses from the Tepper School of Business and from Environmental and Public Policy (CIT) can also count for this requirement (see Additions below). Students may combine 2 mini humanities/arts courses totaling at least 9 units together to form a single course of 9 units or more with advisor approval in consultation with the SCS Associate Dean for Undergraduate Programs. 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.

Deletions

Some courses from the Dietrich College or the College of Fine Arts may not count toward the unconstrained electives in Humanities and Arts in SCS due to the technical (computing and/or mathematical) nature of the courses. In general, any humanities or arts courses that have computer science or mathematics prerequisites do not count toward this requirement.

The following courses do NOT count toward the unconstrained Humanities and Arts electives:

51-257	Introduction to Computing for Creative Practices	10
51-327	Design Center: Introduction to Web Design	9
51-328	Design for Digital Systems	9
54-375	IDeATe: Robotics for Creative Practice	10
70-317	AI, Innovation & Competitive Advantage	9
76-388	Coding for Humanists	9
76-481	Introduction to Multimedia Design	12
76-487	Information Architecture & Content Strategy	9
80-210	Logic and Proofs	9
80-211	Logic and Mathematical Inquiry	9
80-212	Arguments and Logical Analysis	9
80-305	Game Theory	9
80-306	Decision Theory	9
80-310	Formal Logic	9
80-311	Undecidability and Incompleteness	9
80-315	Logics for Knowledge and Belief	9
80-316	Logic and AI	9
80-325	Foundations of Causation and Machine Learning	9
80-411	Proof Theory	9
80-413	Category Theory	9
80-419	Interactive Theorem Proving	9
80-514	Categorical Logic	9
80-516	Causality and Machine Learning	9
80-521	Seminar on Formal Epistemology: Uncertain Interpretations	Var.
85-170	Foundations of Brain and Behavior	9
85-270	Computational Approaches for Neuroscience Questions	9
85-310	Research Methods in Cognitive Psychology	9
85-314	Cognitive Neuroscience Research Methods	9
85-412	Cognitive Modeling	9

85-414	Cognition in the Age of AI	9
85-419	Introduction to Parallel Distributed Processing	9
85-426	Reverse engineering brains and machines	9
85-472	Cognitive Neuropsychology	9
88-251	Empirical Research Methods	9
88-372	Social and Emotional Brain	9

Additions

The following courses from the Dietrich College, the College of Fine Arts, and other Colleges/Schools can count toward the unconstrained Humanities and Arts electives:

07-135	Grand Challenge First-Year Seminar: Designing Better Human-AI Futures	9
07-402	SCS Leadership Development Seminar	9
11-423	ConLanging: Lrng Ling & Lang Tech via Constru Artif. Lang	12
16-161	Artificial Intelligence and Humanity	12
16-397	Art, Conflict and Technology	12
17-333	Privacy Policy, Law, and Technology	9
17-416	Responsible AI & AI Governance: Identifying and Mitigating Risks	Var.
17-562	Computer and AI Law	9
19-101	Introduction to Engineering and Public Policy	12
19-351	Applied Methods for Technology-Policy Analysis	9
19-403	Policies of Wireless Systems	12
19-411	Science and Innovation Leadership for the 21st Century: Firms, Nations, and Tech	9
21-150	Mathematics and the Arts	9
32-201	Leadership & Management	9
32-402	Leadership and Ethics	9
36-303	Sampling, Survey and Society	9
67-348	Black Mirror - Cultural Representations of Technology	9
70-100	Global Business	9
70-101	Business Strategy Fundamentals	9
70-301	Transformational Leadership	9
70-311	Organizational Behavior	9
70-318	Managing Effective Work Teams	9
70-321	Negotiation and Conflict Resolution	9
70-332	Business, Society and Ethics	9
70-340	Business Communications	9
70-341	Team Dynamics and Leadership	9
70-342	Managing Across Cultures	9
70-345	Business Presentations	9
70-348	Cross-Cultural Business Communications	9
70-350	Acting for Business	9
70-352	Business Acting (if combined with a 6+ unit humanities/arts course)	3
70-364	Business Law	9
70-365	International Trade and International Law	9
70-381	Marketing I	9
70-415	Introduction to Entrepreneurship	9
70-430	International Management	9
70-443	Digital Marketing and Social Media Strategy	9
73-102	Principles of Microeconomics	9
73-103	Principles of Macroeconomics	9
73-104	Principles of Microeconomics Accelerated	9
73-230	Intermediate Microeconomics	9
73-240	Intermediate Macroeconomics	9
73-369	Islamic Economics	9
88-312	Decision Models and Games	9

New Courses

In the event that a new course is taught in DC, CFA or TSB, consult with an advisor before taking the course. Your academic advisor will notify the SCS General Education Committee who will review the request and make adjustments to the academic audit if approved. Courses are reviewed based on the constraints given above.