

Carnegie Mellon University

School of Computer Science

Dear Prospective Student,

Welcome to Carnegie Mellon University! We hope you're enjoying your visit to campus. If you are receiving this packet through the mail, we hope you find it useful. Included in this packet is information about undergraduate programs offered at Carnegie Mellon University's School of Computer Science. An overview of the programs can be found at <https://www.cs.cmu.edu/overview-programs>

For complete information regarding the **Bachelor of Science in Computer Science**, visit <https://www.csd.cs.cmu.edu/academics/undergraduate/overview>, the website for the undergraduate Computer Science Department.

If you have questions about the Computer Science Program, please contact Mary Widom (marywidom@cs.cmu.edu (412)-268-9497) or Amy Weis (alweis@cs.cmu.edu (412)-268-5561).

For information about the new **Bachelor of Science in Artificial Intelligence**, please visit the website: <https://cs.cmu.edu/bs-in-artificial-intelligence/>

The **Bachelor of Science in Computational Biology** degree is offered through the School of Computer Science, Computational Biology Department. For more information, visit the undergraduate Computational Biology website at <http://www.cbd.cmu.edu/education/bs-in-computational-biology/>

If you have questions about the Computational Biology Program, please contact Samantha Mudrinich (smudrini@cs.cmu.edu (412)-268-4671).

If you have questions about admissions, financial aid or scholarships, please contact the Office of Admission at 412-268-2082 or send mail to admission@andrew.cmu.edu .

Thank you for your interest in Carnegie Mellon University.

Sincerely,



Mary Widom
Academic Program Administrator,
School of Computer Science, Undergraduate Computer Science Program
email: marywidom@cs.cmu.edu phone: 412-268-9497

Name _____

Minor/DM/DD _____

B.S. in COMPUTER SCIENCE for students entering in Fall 2018

(2018 Audit - 360 units)

15-122	Principles of Imperative Computation	_____	1
15-150	Principles of Functional Programming	_____	2
15-210	Parallel and Sequential Data Structures and Algorithms	_____	3
15-213	Introduction to Computer Systems	_____	4
15-251	Great Theoretical Ideas in Computer Science	_____	5
15-451	Algorithm Design and Analysis	_____	6
15-xxx	Artificial Intelligence (10-401; 11-411; 15-381,386; 16-384,385)	_____	7
15-xxx	Domains (02-250; 05-391; 15-330, 455, 462; 17-313)	_____	8
15-xxx	Logics/Langs (15-312,316,317,414,424; 17-355; 80-413)	_____	9
15-xxx	Software Systems (410, 411, 418, 440, 441, 445)	_____	10
xx-xxx	School of Computer Science Elective	_____	11
xx-xxx	School of Computer Science Elective	_____	12

21-120	Differential and Integral Calculus	_____	13
21-122	Integration and Approximation	_____	14
15-151	Math Foundations for CS (or 21-127 [21-128], Concepts)	_____	15
21-241	Matrices and Linear Transformations (or 21-242, Matrix Theory)	_____	16
xx-xxx	Probability Course (15-359; 21-325; 36-218 or 36-225&226)	_____	17

xx-xxx	Science/Engineering	_____	18
xx-xxx	Science/Engineering	_____	19
xx-xxx	Science/Engineering	_____	20
xx-xxx	Lab Requirement	_____	21
	2 Courses from One Department	_____	

76-101	Writing	_____	22
76-720	Writing for Professions (or 15-300, Research in CS or 08-200)	_____	23
xx-xxx	Cat. 1: Cognition, Choice, & Behavior	_____	24
xx-xxx	Cat. 2: Economic, Political, & Social Institutions	_____	25
xx-xxx	Cat. 3: Cultural Analysis	_____	26
xx-xxx	Unrestricted Humanities or Fine Arts	_____	27
xx-xxx	Unrestricted Humanities or Fine Arts	_____	28
xx-xxx	Unrestricted Humanities or Fine Arts	_____	29

15-128	First Year IC	_____	30
	99-101	Computing @ CM	_____

xx-xxx	Elective (Minor/Free)	_____	31
xx-xxx	Elective (Minor/Free)	_____	32
xx-xxx	Elective (Minor/Free)	_____	33
xx-xxx	Elective (Minor/Free)	_____	34
xx-xxx	Elective (Minor/Free)	_____	35
xx-xxx	Elective (Minor/Free)	_____	36

Name _____

B.S. in ARTIFICIAL INTELLIGENCE for students entering in Fall 2018

(2018 Audit - 360 units)

15-151	Math Foundations for CS (or 21-127 [21-128], Concepts)	_____	1
21-120	Differential and Integral Calculus	_____	2
21-122	Integration and Approximation	_____	3
21-241	Matrices and Linear Transformations (or 21-242, Matrix Theory)	_____	4
36-218	Probability Theory for CS (or 15-359/21-325/36-225 & 36-226)	_____	5
36-401	Modern Regression	_____	6

15-122	Principles of Imperative Computation	_____	7
15-150	Principles of Functional Programming	_____	8
15-210	Parallel and Sequential Data Structures and Algorithms	_____	9
15-213	Introduction to Computer Systems	_____	10
15-251	Great Ideas in Theoretical Computer Science	_____	11

07-180	Concepts in Artificial Intelligence (mini)	_____	12
15-381	Intro to AI Representation and Problem Solving	_____	13
10-401	Intro to Machine Learning	_____	14
xx-xxx	Required AI Core Elective (11-411 or 16-385)	_____	15

xx-xxx	Decision Making/Robotics (15-386,483,494; 16-350,362,384)	_____	16
xx-xxx	Machine Learning (10-403; 11-441,485; 36-402)	_____	17
xx-xxx	Perception/Language (11-442,492; 15-387,463; 16-421)	_____	18
xx-xxx	Human-AI Interaction (05-391; 16-467)	_____	19

xx-xxx	School of Computer Science Elective	_____	20
xx-xxx	School of Computer Science Elective	_____	21

xx-xxx	Science/Engineering _____	_____	22
xx-xxx	Science/Engineering _____	_____	23
xx-xxx	Science/Engineering _____	_____	24
xx-xxx	Lab Requirement _____	_____	25
	2 Courses from one department _____		

76-101	Interpretation and Argument	_____	26
xx-xxx	Ethics Elective (16-161; 17-200; 80-249)	_____	27
xx-xxx	Cat. 1: [Cognition] (85-211,213,370,390,408,412,421,426)	_____	28
xx-xxx	Cat. 2: Economic, Political, & Social Institutions	_____	29
xx-xxx	Cat. 3: Cultural Analysis	_____	30
xx-xxx	Unrestricted Humanities or Fine Arts	_____	31
xx-xxx	Unrestricted Humanities or Fine Arts	_____	32
xx-xxx	Unrestricted Humanities or Fine Arts	_____	33

15-128	Freshman IC _____	99-101 Computing @ CM _____	34

xx-xxx	Free Elective _____	_____	35
xx-xxx	Free Elective _____	_____	36

University AP Policy

Advanced Placement (AP) Course Credit Assignments

AP Exam	Score	Carnegie Mellon Course Award/Equivalency	CMU Units
Art History	5	60-011, AP Art History	9
Biology	4	03-011, AP 4 Biology	9
	5	03-110, AP 5 Biology (complete the CMU attainment exam	
Calculus AB and subscore	4	21-111, Calculus (for Dietrich College students only)	10
	5	21-120, Differential and Integral Calculus	10
Calculus BC	5	21-120, Differential and Integral Calculus and 21-122, Integrations, Differential Equations and Approximation	10 & 10
Chemistry	5	09-105, Introduction to Modern Chemistry I	10
Chinese Language & Culture	4	82-011, AP 4 Chinese (completes the Chinese placement test and consult with the faculty advisor for Chinese Studies for credit to change to 82-231, Intermediate Chinese I)	12
	5	82-011, AP 4 Chinese (complete the Chinese placement test and consult with the faculty advisor for Chinese Studies for credit to change to: 82-231, Intermediate Chinese I) and 82-012, AP 5 Chinese (complete the Chinese placement test and consult with the faculty advisor for Chinese Studies for credit to change to: 82-236, Intensive Chinese Language & Culture). NOTE: With the completion and successful evaluation of an additional 500-word essay, credit for 82-236 could be converted to credit for 82-232, Intermediate Chinese II, for 12 units.	12 & 9
Computer Science A	4	15-110, Principles of Computing	10
	5	15-112, Fundamentals of Programming	12
Computer Science Principles	4 or 5	15,110, Principles of Computing	10
Economics-Micro (alone)	5	No credit – placement only (student may take 73-103 before 73-102)	-
Economics-Micro and Macro	5 on both Exams	73-011, AP Economics (student may take 73-103 before 73-102)	9
English Language and Composition	5	76-011, AP English (must take 76-101 at CMU)	9
English Literature and Composition	5	76-012, AP English Lit & Comp (must take 76-101 at CMU)	9
Environmental Science	4 or 5	38-012, AP Environmental Science	9
European History	5	79-011, AP European History	9
French Language & Culture	4	82-013, AP 4 French (complete the French placement test and consult with the faculty advisor for French and Francophone Studies for credit to change to: 82-201, Intermediate French I)	9
	5	82-013, AP 4 French (complete the French placement test and consult with the faculty advisor for French & Francophone Studies for credit to change to: 82-201, Intermediate French I) and 82-014, AP 5 French A (complete the French placement test and consult with the faculty advisor for French and Francophone Studies for credit to change to: 82-202, Intermediate French II)	9 & 9
German Language & Culture	4	82-015 AP 4 German (complete the German placement test and consult with the faculty advisor for German Studies for credit to change to: 82-221, Intermediate German I)	9
	5	82-015 AP 4 German (complete the German placement test and consult with the faculty advisor for German Studies for credit to change to: 82-221, Intermediate German I) and 82-016, AP 5 German (complete the German placement test and consult with the faculty advisor for German Studies for credit to change to: 82-222, Intermediate German II)	9 & 9
Government & Politics: Comparative	4 or 5	84-011, AP Government & Politics: Comparative	9
Government & Politics: US	4 or 5	84-012, AP Government & Politics: US	9

Human Geography	4 or 5	66-011, AP Human Geography	9
Italian Language & Culture	4	82-017, AP 4 Italian (complete the Italian placement test and consult with the faculty advisor for Italian Studies for credit to change to: 82-261, Intermediate Italian I)	9
	5	82-017, AP 4 Italian (complete Italian placement test and consult the Senior Lecturer in Italian to convert to 82-261, Intermediate Italian I) and 82-018, AP 5 Italian (complete Italian placement test and consult the Senior Lecturer in Italian to convert to 82-262, Intermediate Italian II)	9 & 9
Japanese Language & Culture	4	82-019, AP 4 Japanese (complete the Japanese placement test and consult with the faculty advisor for Japanese Studies for credit to change to: 82-172, Elementary Japanese II)	12
	5	82-019, AP 4 Japanese (complete the Japanese placement test and consult with the faculty advisor for Japanese Studies for credit to change to: 82-172, Elementary Japanese II) and 82-020, AP 5 Japanese (complete the Japanese placement test and consult with the faculty advisor for Japanese Studies for credit to change to: 82-271, Intermediate Japanese I)	12 & 12
Latin	4	66-019, AP 4 Latin	9
	5	66-019, AP 4 Latin and 66-020, AP 5 Latin	9 & 9
Music Theory	4 or 5	57-012, AP Music Theory	9
Physics C – Electricity and Magnetism	5	33-142, Physics II for Engineering Students	12
Physics C – Mechanics	5	33-141, Physics I for Engineering Students	12
Psychology	4 or 5	82-011, AP Psychology	9
Social & Cultural Anthropology	4 or 5	79-016, AP Anthropology	9
Spanish Language	4	82-021, AP 4 Spanish (complete the Spanish placement test and consult with the faculty advisor for Hispanic Studies for credit to change to: 82-241, Intermediate Spanish I)	9
	5	82-021, AP 4 Spanish (complete the Spanish placement test and consult with the faculty advisor for Hispanic Studies for credit to change to: 82-241, Intermediate Spanish I) and 82-022, AP 5 Spanish (complete the Spanish placement test and consult with the faculty advisor for Hispanic Studies for credit to change to: 82-242, Intermediate Spanish II)	9 & 9
Spanish Literature & Culture	4	82-023, AP 4 Spanish (complete the Spanish placement test and consult with the faculty advisor for Hispanic Studies for credit to change to: 82-241, Intermediate Spanish I)	9
	5	82-023, AP 4 Spanish (complete the Spanish placement test and consult with the faculty advisor for Hispanic Studies for credit to change to: 82-241, Intermediate Spanish I) and 82-024, AP 5 Spanish (complete the Spanish placement test and consult with the faculty advisor for Hispanic Studies for credit to change to: 82-242, Intermediate Spanish II)	9 & 9
Spanish Language and Spanish Literature & Culture	5 & 5	82-022, AP 5 Spanish Language (complete the Spanish placement test and consult with the faculty advisor for Hispanic Studies for credit to change to: 82-241, Intermediate Spanish I) + 82-024 AP 5 Spanish Literature & Culture (complete the Spanish placement test and consult with the faculty advisor for Hispanic Studies for credit to change to: 82-242, Intermediate Spanish II) and 82-341, Advanced Spanish	9 & 9 & 9
Statistics	4 or 5	36-200, Reasoning with Data	9
Studio Art: 2-D Design	4 or 5	51-011, AP Studio Art: 2-D	9
Studio Art: 3-D Design	4 or 5	51-012, AP Studio Art: 3-D	9
Studio Art: Drawing	5	60-012, AP Studio Art: Drawing	9
United States History	5	79-012, AP United States History	9
World History	5	79-015, AP World History	9

*Exams and scores not listed do not receive credit.

Questions about Carnegie Mellon University's Advanced Placement Credit Policy may be directed to the University Registrar's Office at university-registrars-office@andrew.cmu.edu.

Computer Science Major Program Requirements (360 Units)



B.S. in Computer Science: Sample Course Schedule

Note: For Students With AP Computer Science or College Credit in Introductory Programming

First Year: Fall

Course #	Units	Course Name
15-122	10	Principles of Imperative Computation
07-128	1	Freshman Immigration Course
15-151	10	Mathematical Foundations for Computer Science
21-120	10	Differential and Integral Calculus
76-101	9	Interpretation and Argument
99-10x	3	Computing Skills Workshop

First Year: Spring

Course #	Units	Course Name
15-150	10	Principles of Functional Programming
15-251	12	Great Ideas in Theoretical CS
21-122	10	Integration and Approximation
xx-xxx	9	Science/Engineering Course
xx-xxx	9	Humanities and Arts Elective

Sophomore Year: Fall

Course #	Units	Course Name
15-213	12	Introduction to Computer Systems
21-241	10	Matrices and Linear Transformations
xx-xxx	9	Science/Engineering Course
xx-xxx	9	Humanities and Arts Elective
xx-xxx	9	Minor Requirement/Free Elective

Sophomore Year: Spring

Course #	Units	Course Name
15-210	12	Parallel and Sequential Data Structures and Algorithms
xx-xxx	9	Computer Science: Domains Elective
xx-xxx	9	Science/Engineering Course
xx-xxx	9	Humanities and Arts Elective
xx-xxx	9	Minor Requirement/Free Elective

Junior Year: Fall

Course #	Units	Course Name
15-451	12	Algorithm Design and Analysis
xx-xxx	9	Computer Science: Logics/Languages Elective
xx-xxx	9	Technical Communications Course
xx-xxx	9	Probability Course
xx-xxx	9	Minor Requirement/Free Elective

Junior Year: Spring

Course #	Units	Course Name
15-xxx	12	Computer Science: Systems Elective
xx-xxx	9	Computer Science: AI Elective
xx-xxx	9	Humanities and Arts Elective
xx-xxx	9	Science/Engineering Course
xx-xxx	9	Minor Requirement/Free Elective

Senior Year: Fall

Course #	Units	Course Name
xx-xxx	9	School of Computer Science Elective
xx-xxx	9	Humanities and Arts Elective
xx-xxx	9	Minor Requirement/Free Elective
xx-xxx	9	Minor Requirement/Free Elective

Senior Year: Spring

Course #	Units	Course Name
xx-xxx	9	School of Computer Science Elective
xx-xxx	9	Humanities and Arts Elective
xx-xxx	9	Minor Requirement/Free Elective
xx-xxx	9	Minor Requirement/Free Elective

Artificial Intelligence Major Program Requirements (360 Units)



Questions? Email us at bsai@cs.cmu.edu

B.S. in Artificial Intelligence: Sample Course Schedule

FALL			YEAR 1	SPRING		
#	Units	Name		#	Units	Name
15-122	10.0	Principles of Imperative Computation	YEAR 1	15-251	12.0	Great Theoretical Ideas in Computer Science
21-120	10.0	Differential and Integral Calculus		21-122	10.0	Integration and Approximation
15-151	10.0	Math Foundation of CS		21-241	10.0	Matrices and Linear Transformations
76-101	9.0	Interpretation & Argument		15-150	10.0	Principles of Functional Programming
07-128	1.0	Freshman Immigration		07-180	2.0	Concepts in AI (mini)
99-10X	3.0	Computing				

FALL			YEAR 2	SPRING		
#	Units	Name		#	Units	Name
15-381	10.0	AI: Representation & Problem Solving	YEAR 2	10-401	12.0	Intro to Machine Learning
21-120	10.0	Parallel & Seq. Data Structures		15-213	12.0	Intro to Computer Systems
15-151	10.0	Math Foundation of CS		-----	9.0	Humanities and Arts Elective
36-218 OR	9.0	Probability Theory & Computer Science		-----	9.0	Science/Engineering Elective
15-359	12.0	Probability and Computing		-----	9.0	Free Elective
-----	1.0	Science/Engineering Elective				
-----	3.0	Ethics Elective				

FALL			YEAR 3	SPRING		
#	Units	Name		#	Units	Name
16-385 OR	9.0	Computer Vision	YEAR 3	-----	9.0	AI Elective
11-411	12.0	Natural Language Processing		-----	9.0	AI Elective
-----	9.0	AI Elective		-----	9.0	Science/Engineering Elective
36-401	9.0	Modern Regression		-----	9.0	Humanities and Arts Elective
-----	9.0	Humanities and Arts Elective		-----	9.0	Free Elective
-----	9.0	Free Elective				

FALL			YEAR 4	SPRING		
#	Units	Name		#	Units	Name
-----	9.0	SCS Elective	YEAR 4	-----	9.0	SCS Elective
-----	9.0	AI Elective		-----	9.0	Humanities and Arts Elective
-----	9.0	Science/Engineering Elective		-----	9.0	Humanities and Arts Elective
-----	9.0	Humanities and Arts Elective		-----	9.0	Free Elective
-----	9.0	Free Elective				

Course of Study Requirements for Artificial Intelligence Majors

Math and Statistics Core:

- Math Foundations of Computer Science**
- Differential and Integral Calculus
- Integration and Approximation
- Matrices and Linear Transformations
- Probability Theory for Computer Scientists
- Modern Regression

Artificial Intelligence Core:

- Concepts in Artificial Intelligence (Mini)
- Introduction to AI Representation and Problem Solving
- Introduction to Machine Learning

Take one of the following courses:

- Introduction to Natural Language Processing
- Introduction to Computer Vision

Computer Science Core:

- Freshman Immigration Course
- Principles of Imperative Computation
- Principles of Functional Programming
- Parallel and Sequential Data Structures and Algorithms
- Introduction to Computer Systems
- Great Theoretical Ideas in Computer Science

Ethics Elective (1 course from the following):

- Freshman Seminar: Artificial Intelligence and Humanity
- Ethics and Policy Issues in Computing
- AI, Society and Humanity

BSAI students take 7 courses in the Humanities and Arts.* (1 course must be in cognitive science or cognitive psychology):

Examples include:

- Cognitive Psychology
- Human Information Processing and Artificial Intelligence
- Perception
- Human Memory
- Visual Cognition
- Cognitive Modeling
- Language and Thought
- Learning in Humans and Machines
- AI Cluster Electives (4 Courses)

Take one course from each of the following areas:

Decision Making and Robotics Cluster

- Neural Computation
- Truth, Justice and Algorithms
- Cognitive Robotics
- Strategic Reasoning for AI (new)
- Planning Techniques for Robotics
- Mobile Robot Programming Laboratory
- Robot Kinematics and Dynamics
- Planning, Execution and Learning

Machine Learning Cluster

- Deep Reinforcement Learning and Control
- Machine Learning for Text Mining
- Introduction to Deep Learning
- Advanced Data Analysis

Perception and Language Cluster

- Search Engines
- Speech Processing
- Computational Perception
- Computational Photography
- Vision Sensors

Human-AI Interaction Cluster

- Designing Human-Centered Systems
- Human-Robot Interaction
- Learning From People (new)
- Design Studio on Intelligent Products and services (new)

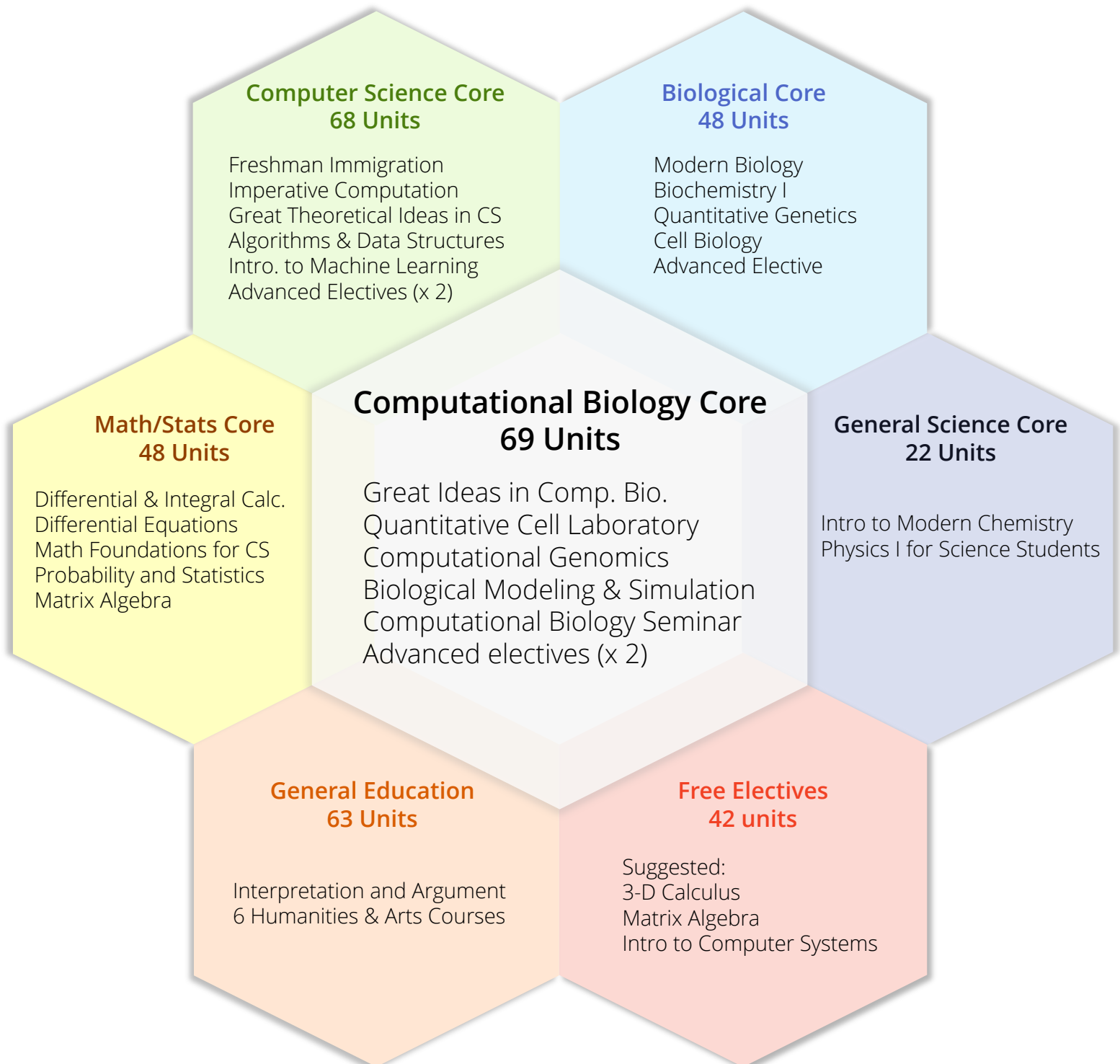
Science and Engineering*:

Students take four courses in Science and Engineering.

* General education requirement for SCS Students

** If not available, Concepts of Mathematics can be substituted.

Computational Biology Major Program Requirements (360 Units)



Computational Biology Major Sample Course Schedule

Year 1

Differential & Integral Calculus
Imperative Computation
Mathematical Foundations for CS
Interpretation & Argument
SCS Immigration Course
Great Practical Ideas in CS



Great Ideas in Computational Biology
Modern Biology
Integration & Approximation
Intro to Modern Chemistry I
Humanities & Arts Elective



Year 2

Quantitative Cell Lab
Quantitative Genetic Analysis
Physics I for Science Students
Algorithms & Data Structures
Humanities & Arts Elective



Computational Biology Elective
Great Theoretical Ideas in CS
Biochemistry I
Matrices and Linear Transformations



Year 3

Methods for Biological Modeling
Cell Biology
Probability and Statistics
Computer Science Elective
Humanities & Arts Elective



Computational Genomics
Computational Biology Seminar
Intro to Machine Learning
Biology Elective
Humanities & Arts Elective



Year 4

Computational Biology Elective
Computer Science Elective
Humanities & Arts Elective
Free Elective



Humanities & Arts Elective
Free Elective
Free Elective
Free Elective





Carnegie Mellon University
School of Computer Science

The Bachelor of Science in **Artificial Intelligence**

Carnegie Mellon University has led the world in artificial intelligence education and innovation since the field was created. It's only natural that its School of Computer Science would offer the nation's first bachelor's degree in artificial intelligence. If you're a high school student who wants to use tools like machine learning, natural language processing, computer vision, robotics and human-computer interaction to improve human lives, **we want you to join us.**



CMUAI | **Carnegie Mellon University**
Artificial Intelligence

AWESOME! TELL ME MORE.

The BSAI program gives you the in-depth knowledge you need to transform large amounts of data into actionable decisions. The program and its curriculum focus on how complex inputs — like vision, language and huge databases — can be used to make decisions or enhance human capabilities. The curriculum includes coursework in computer science, math, statistics, computational modeling, machine learning and symbolic computation. Because CMU is devoted to AI for social good, you'll also take courses in ethics and social responsibility, with the option to participate in independent study projects in areas like healthcare, transportation and education.

You'll take classes led by faculty members from our Computer Science Department, Human-Computer Interaction Institute, Institute for Software Research, Language Technologies Institute, Machine Learning Department and Robotics Institute.

When you earn a B.S. in AI from SCS, you'll have the computer science savvy and skills our alumni are known for, with the added expertise in machine learning and automated reasoning that you'll need to build the AI of tomorrow.

WHAT KINDS OF CLASSES WILL I TAKE?

BSAI majors take courses in math and statistics, computer science, AI, science and engineering, and humanities and arts. You'll take a course in ethics in AI, and we've built room into the curriculum for academic exploration via electives.

Turn over to see how the curriculum breaks down. ►



BSAI majors will take courses in math and statistics, computer science, AI, science and engineering, and humanities and arts. There's also room built into the curriculum for academic exploration via electives.



HOW DO I APPLY?

To enroll in the BSAI program, first you need to be accepted into our School of Computer Science. Once you're at Carnegie Mellon and enrolled in SCS, you can declare a BSAI major in the spring of your first year. Note that space in the major is limited, so acceptance into the BSAI program isn't guaranteed. (Don't worry! You can still earn a B.S. in computer science or computational biology and take a variety of AI courses.)

When you apply to CMU's School of Computer Science, be sure that your personal essay highlights your interest in artificial intelligence and why pursuing a degree in the field is important to you.

What Do I Do Next?

IF YOU WANT TO STUDY AI AT CMU:

1. Apply to Carnegie Mellon University's School of Computer Science by January 1.
2. Include artificial intelligence in your personal essay.
3. Eagerly anticipate your application results in April.
4. If you're accepted, enroll in SCS by May 1.
5. Complete your first semester in SCS.
6. Apply for admission into the BSAI program in the spring of your freshman year.

WHERE DO I GO FOR MORE INFORMATION?

- Applying to CMU: cmu.edu/apply
- The BSAI program: cs.cmu.edu/bsai
- AI at CMU: ai.cs.cmu.edu
- SCS at CMU: cs.cmu.edu
- Contact us: bsai@cs.cmu.edu

Carnegie Mellon University
School of Computer Science

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PITTSBURGH, PA 15213-3890

SCSatCMU

FACT SHEET

You probably know that Carnegie Mellon University's School of Computer Science is home to the #1 Computer Science Graduate School in the nation. Did you also know that it is home to one of the world's premier Computer Science undergraduate programs?

Did you know...

The University received over 8,700 applications for the 2018 SCS first year class. The initial size of the incoming 2018 class is 211 students.

The SCS undergraduate programs recognize that high school education in Computer Science is not uniform. Because of this, different entry points are available for the curriculum to accommodate students with widely varying backgrounds. For example, about 30% of the 2018 CS first year class came to Carnegie Mellon University with no prior formal computer programming experience.

The School of Computer Science believes that it is critical to educate students with a wide range of perspectives in order to ensure that information technology benefits all of humanity. Our 2018 CS first year class reflects that diversity with a representation of 50% women, 39 different states, and 12 different countries contributing 18% international students.

As a reflection of the increasing quality of the students admitted, 66% of the 2018 senior class graduated with University Honors (a QPA of 3.5 or above).

The Carnegie Mellon University School of Computer Science has over 200 full-time faculty members, many of whom are counted among the top researchers and educators in their fields, worldwide. Randal Bryant, former Dean of SCS, was elected to the prestigious and highly selective National Academy of Engineering (NAE), one of the highest professional distinctions an engineer can achieve.

The Turing Award is the most prestigious award given by the Association for Computing Machinery, and is widely considered to be the "Nobel Prize" of the field of Computer Science. Current winners on our faculty include Manuel Blum (computational complexity theory with applications to cryptography and program checking), Edmund Melson Clarke (model-checking for hardware and software verification), and Raj Reddy (design and construction of large scale artificial intelligence systems).

Full-time faculty members in their area of expertise teach all of the CS courses required for the Bachelor of Science, Bachelor of Artificial Intelligence and Bachelor of Computational Biology degrees in the School of Computer Science.

The SCS undergraduate programs offer some of the most pedagogically innovative and educationally rigorous teaching methods in the world. Course offerings span a diverse set of topics, including: "Creating Intelligent Robots", "Entrepreneurship for Computer Science", "Parallel Computer Architecture and Programming", "Computational Discrete Mathematics", "Foundations of Cyber-Physical Systems", "Cloud Computing" and "Animation Art and Technology".

Computer Science undergraduates work actively with the faculty, including teaching assistantships, independent studies and senior thesis work in advanced areas of research. Recent thesis topics include

- Approximating Densest k-Subhypergraph
- Representations and Complexity of Abelian Automaton Groups
- Approximations to Generalized Facility Location Problems
- Securing Database-Backed Web Applications Through Lightweight, Automated Verification
- A General System of Adjoint Logic
- Traveling Salesman Problem under Stability Considerations
- The Next 700 Failed Step-Index-Free Logical Relations
- Automatic Algorithmic Choice for Differential Privacy
- Retinal Prosthetics: Restoring Sight to the Blind Using Computer Vision
- Algorithms for Social Good: Kidney Exchange
- Identifying Security-Critical Components with Attack Path Planning

Carnegie Mellon University's School of Computer Science students participate in campus and community life, including Student Senate, The Tartan campus newspaper, the Kiltie Band, All-University Orchestra, varsity and intramural sports, Greek life, theatre, and the Fifth Year Scholar Program.

There were 36 distinct degree combinations (CS plus a secondary concentration) completed by the CS class of 2018, including: 31 minors, 12 additional majors, and 3 different dual degree combinations.

The 2017 median starting salary for our CS graduates is \$109,000, with placement in all of the major information technology companies, including: Google, Microsoft, Amazon, Apple, Facebook, Dropbox, Palantir and many others.

Some of Carnegie Mellon University's CS graduates go on to advanced graduate studies at the most prestigious research and teaching institutions in the world, including MIT, Stanford, Berkeley, Cornell, and of course, Carnegie Mellon University.

The School of Computer Science boasts a world-renowned competitive programming team. The team competes both in intramurals and through the Association for Computing Machinery's (ACM) International Collegiate Programming Competition (ICPC), where it has reached the World Finals almost every year in recent history.

Over more than ten years, CMU has produced three Computer Research Association (CRA) Outstanding Undergraduate Award Winners, including 2 finalists, 2 runners-up, and 19 honorable mentions. CRA's Outstanding Undergraduate Awards program recognizes undergraduate students in North American universities who show outstanding research potential in an area of computing research.

Minors

Business Administration	15
Chemistry	1
Chinese Studies	2
Computational Biology	2
Computational Finance	3
Creative Writing	1
Discrete Math & Logic	7
Drama	3
Economics	2
Engineering Studies	4
Film and Media Studies	1
French/Francophone Studies	1
Game Design	7
Human-Computer Interaction	15
Int'l Relations & Politics	1
Japanese Studies	4
Language Technologies	5
Machine Learning	29
Mathematical Sciences	24
Media Design	2
Neural Computation	3
Neuroscience	1
Philosophy	2
Physics	2
Politics & Public Policy	1
Psychology	1
Robotics	15
Security	3
Social & Political History	2
Software Engineering	4
Statistics	5

Additional Majors

Cognitive Science	1
Discrete Math & Logic	3
Economics	1
Human-Computer Interaction	2
French & Francophone Studies	1
Global Studies	1
Linguistics	1
Mathematical Sciences	2
Operations Research & Stats	1
Philosophy	1
Robotics	2
Statistics	2

Dual Degrees

Discrete Math & Logic	2
Electrical & Computer Eng.	2
Physics	2

Note: Some students complete more than one minor and/or additional major.

Number of students earning University Honors (cumulative grade point average of at least 3.5)	113
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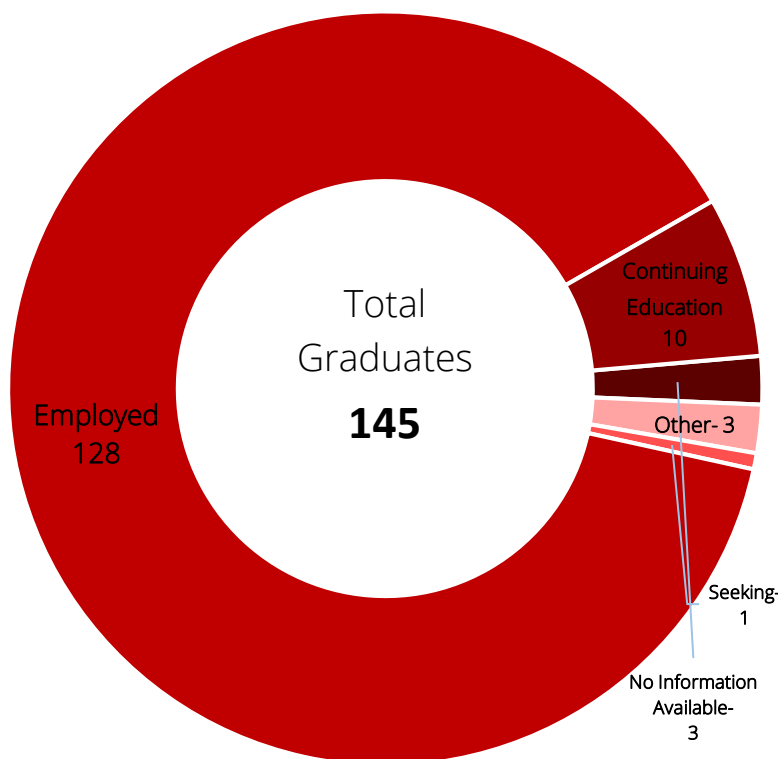
Number of students earning College Honors (completion of a senior honors research thesis)	17
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Average grade point average of the graduating class	3.52
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2017 CMU FIRST DESTINATION OUTCOMES

School of Computer Science: Computer Science-Bachelor's

DESTINATION OUTCOMES



SALARIES

AVERAGE SALARY =
\$108,532

MEDIAN SALARY =
\$109,000

SALARY RANGE =
\$48,000 – 150,000

*Other = volunteer, military, return to home country, seeking graduate school, or delay in post graduate search.

EMPLOYMENT DESTINATIONS

EMPLOYER	JOB TITLE	CITY	STATE/COUNTRY
Affirm (3)	Software Engineer	San Francisco	California
Airbnb	Software Engineer	San Francisco	California
Alarm.com	Software Developer	Tysons	Virginia
Amazon (8)	Software Engineer (2)	Seattle	Washington
		Boston	Massachusetts
	Software Development Engineer (4)	Seattle	Washington
	Software Developer	Sunnyvale	California
	Software Development Engineer	Herndon	Virginia
Applied Predictive Technologies (3)	Software Engineer	Arlington	Virginia
	Database Analyst (2)	Arlington	Virginia
Asana	Software Engineer	San Francisco	California
B12	Software Engineer	New York City	New York
Bank of America Merrill Lynch	Technology Analyst	New York City	New York
Belvedere Trading	Software Engineer	Chicago	Illinois

2017 CMU FIRST DESTINATION OUTCOMES

School of Computer Science: Computer Science-Bachelor's

EMPLOYER	JOB TITLE	CITY	STATE/COUNTRY
Capital One	Associate Software Engineer	New York City	New York
Chan Zuckerberg Initiative	Software Engineer	Palo Alto	California
Dropbox	Software Engineer	San Francisco	California
Duolingo	Software Engineer	Pittsburgh	Pennsylvania
Eaton	Penetration Tester	Pittsburgh	Pennsylvania
Facebook (18)	Software Engineer (5)	Seattle	Washington
	Software Engineer (10)	Menlo Park	California
	Software Engineer (2)	New York City	New York
	Software Engineer	Washington	District of Columbia
FireEye	Project Manager	Washington	District of Columbia
FitBit	Software Engineer	San Francisco	California
Fulcrum Analytics	Data Engineer	New York City	New York
GoDaddy	Software Engineer	Cambridge	Massachusetts
Goldman Sachs	Technology Analyst	New York City	New York
Google (32)	Software Engineer	Cambridge	Massachusetts
	Software Engineer (17)	Mountain View	California
	Software Engineer (5)	New York City	New York
	Software Engineer, Tools and Infrastructure	New York City	New York
	Software Engineer (2)	Pittsburgh	Pennsylvania
	Software Engineer (2)	San Francisco	California
	Software Engineer Tools and Infrastructure	Seattle	Washington
	Software Engineer (2)	Seattle	Washington
Google DeepMind	Research Engineer	Greater London	England
Grant Street Group	Software Developer	Pittsburgh	Pennsylvania
Heap	Software Engineer	San Francisco	California
IMC Chicago	Software Developer	Chicago	Illinois
Jane Street Capital (2)	Software Developer	New York City	New York
Jet.com	Software Engineer	Hoboken	New Jersey
Medallia	Software Engineer	San Mateo	California
MemSQL (2)	Software Engineering Intern	San Francisco	California
	Software Engineer	San Francisco	California
Microsoft (11)	Software Engineer	Seattle	Washington
NVIDIA	Software Engineer	Beaverton	Oregon
Palantir	Forward Deployed Software Engineer	Washington	District of Columbia
Petuum, Inc.	Research Engineer	Pittsburgh	Pennsylvania
Pocket Gems	Associate Product Manager	San Francisco	California
Polyvore	Software Engineer	San Francisco	California

2017 CMU FIRST DESTINATION OUTCOMES

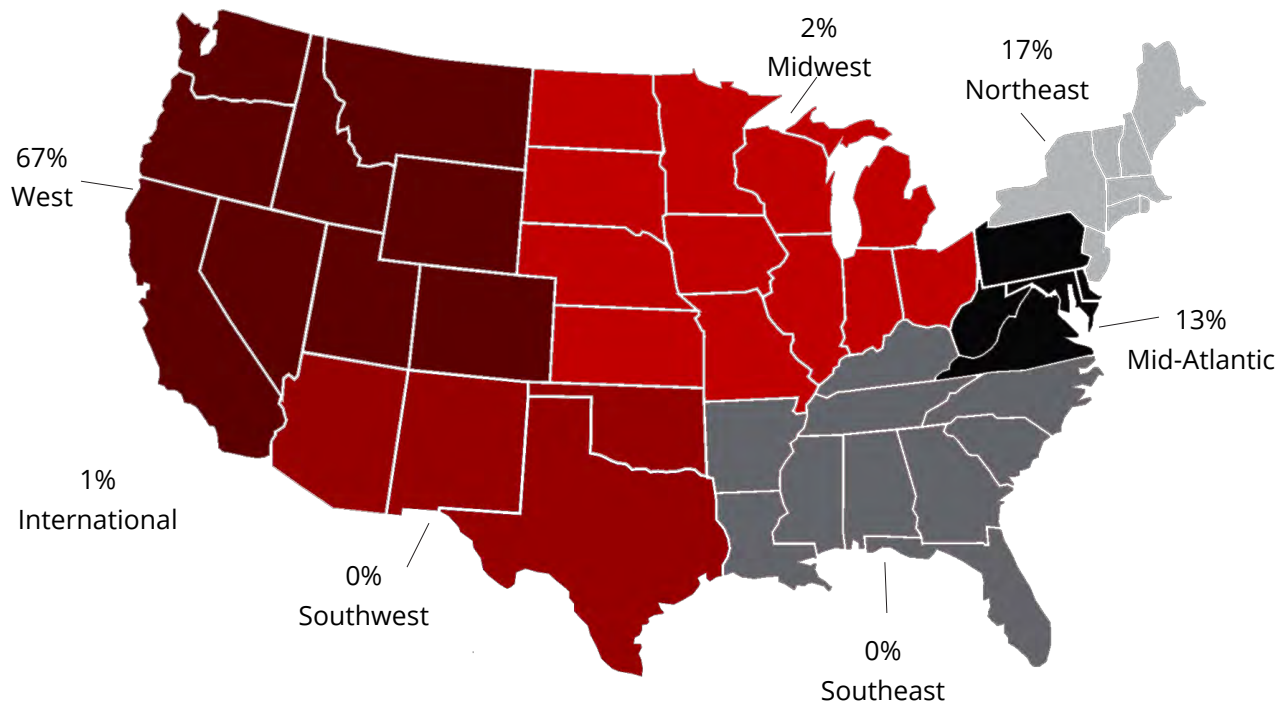
School of Computer Science: Computer Science-Bachelor's

EMPLOYER	JOB TITLE	CITY	STATE/COUNTRY
Qualcomm	Engineer	San Diego	California
Robinhood	Backend Engineer	Palo Alto	California
Semmler	Software Engineer	Herndon	Virginia
SNAP (2)	Software Engineer	Venice	California
Splunk	Frontend Software Engineer	San Francisco	California
Square	Software Engineer	San Francisco	California
Stripe	Software Engineer	San Francisco	California
Symbotix, LLC	Software Engineer	Wilmington	Massachusetts
Thumbtack	Software Engineer	San Francisco	California
Twilio	Software Engineer	San Francisco	California
Twitch	Software Engineer	San Francisco	California
Uber Advanced Technologies Group (2)	Software Engineer--Perception	Pittsburgh	Pennsylvania
	Software Engineer	Pittsburgh	Pennsylvania
VMware, Inc.	Software Engineer	Palo Alto	California
Volant Trading	Software Engineer	New York City	New York
WhatsApp (2)	Software Engineer	Menlo Park	California
Yext	Software Engineer	New York City	New York
YugaByte	Software Engineer	Sunnyvale	California
Zillow (2)	Software Development Engineer	Seattle	Washington

2017 CMU FIRST DESTINATION OUTCOMES

School of Computer Science: Computer Science-Bachelor's

EMPLOYMENT DESTINATIONS BY REGION



CONTINUING EDUCATION DESTINATIONS

INSTITUTION	PROGRAM	DEGREE
Carnegie Mellon University	Computer Science	Masters
Carnegie Mellon University	Computer Science, Robotics	Masters
Carnegie Mellon University (2)	Human Computer Interaction	Masters
Carnegie Mellon University (2)	Language Technologies	Masters
Carnegie Mellon University (2)	Machine Learning	Masters
Massachusetts Institute of Technology	Computer Science	Doctorate
University College, London	Machine Learning	Masters

Source: Post-graduation data compiled from 97% of graduating Computer Science students (Bachelor's Degree). This includes students who graduated in August 2016, December 2016, & May 2017.

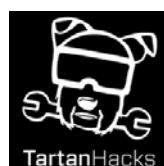
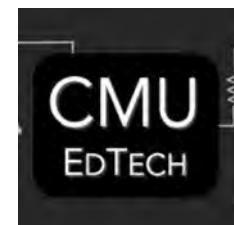
Note: Some recent graduates chose not to provide employer, job title, salary, and/or graduate school information in their response. This information includes all full-time salaries reported with the exception of internships, military service, or those positions outside the U.S.

Last updated December 2017

Carnegie Mellon University

School of Computer Science

STUDENT EVENTS AND ORGANIZATIONS



CMU Computer Club

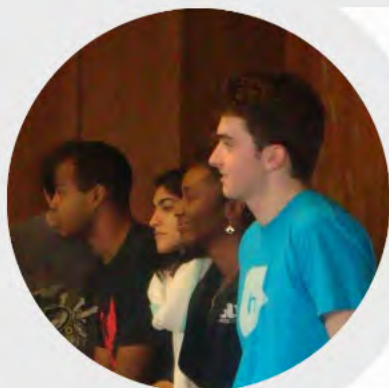


PARTNERED WITH
Women@SCS

SCS4ALL

SCHOOL OF COMPUTER SCIENCE
Carnegie Mellon University

VISIT OUR WEBSITE AT
scs4all.cs.cmu.edu



OUR MISSION

We are an advisory council working to develop a program of social and professional activities and leadership opportunities to sustain and broaden participation in computing. We are committed to expanding and valuing diversity and inclusion in the School of Computer Science and beyond.



COMMUNITY BUILDING

We work to promote diversity and inclusion in the School of Computer Science by developing programs designed by, and for, ALL students. Our programs include socials, professional development activities, and BiasBusters workshops. We provide opportunities for leadership, teaching, and team-building skills.



OUTREACH PROGRAMS

Through our Roadshows and TechNights programs, we aim to expose more K-12 students and educators to the breadth of CS and career opportunities in computing. Through our BiasBusters program we aim to raise awareness and discussion around issues of unconscious bias to develop a more inclusive culture.

women@scs
....working to broaden understanding
and participation in computing
<http://women.cs.cmu.edu>



Women@SCS is a professional organization of faculty, graduate and undergraduate students in the School of Computer Science at Carnegie Mellon University. We work to create, encourage, and support academic, social, and professional opportunities for women in computer science..... and to promote the breadth of the field and its diverse community.

What we do

On
campus

Building Professional Community

- Professional, leadership and networking opportunities
- Programs designed and implemented by students
- Big Sister/Little Sister Mentoring Program
- Graduate Sisters Program
- Faculty/Student Events
- Invited Speakers
- Applying to Grad School advice
- Peer-to-peer courses advice
- Resume building
- Scholarship opportunities
- Start-up opportunities
- Social activities and fun!
- A wonderful student run web site:

<http://women.cs.cmu.edu>

What we do

Off
campus

OUTREACH:

> The Outreach Roadshow

Since 2003 --a fun and interactive presentation by Women@SCS students for K-12 students, parents and teachers aimed at broadening understanding of computer science.

> Creative Technology Nights for Girls (TechNights)

Since 2005 --free weekly workshops providing hands-on technology skills for middle school girls.

> Conferences and Workshops (Attending and Presenting)

Grace Hopper Celebration of Women in Computing * CS4HS * Richard Tapia Celebration of Diversity in Computing * SIGCSE: Special Interest Group in CS Education * AAAS Family Science Days * Expanding Your Horizons (EYH)

> OurCS: Opportunities for Undergraduate Research in Computer Science

A first-of-its-kind research focused conference for undergraduate women in computer science from across the nation and beyond.

Students Speak

"You get a lot of connections with faculty members that if I wasn't in Women@SCS, I wouldn't normally get."

"I'm a teaching assistant for a class I wouldn't have taken if I hadn't met (my Big Sister) who TA'ed it before me. She told me *you would love this class...* and it was one of the highlights of my whole academic career here."

"It's provided a group of friends more than anything else....a very close network of friends that I wouldn't have really met otherwise."

For more information contact:
Dr. Carol Frieze
Director, Women@SCS
School of Computer Science
Carnegie Mellon
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The Swartz Center for Entrepreneurship helps creative thinkers receive the support they need to transform big ideas into winning ventures.

We offer support, collaboration, and inspiration at every step in the process of bringing great CMU ideas to market. By accelerating research innovations and nurturing promising ideas, The Swartz Center acts as a central resource for entrepreneurial students, faculty, staff, and alumni looking to tap into the “innovation ecosystem” – in Pittsburgh and beyond.

Our mission is threefold:

- Defining CMU as the “destination of choice” for students and faculty interested in entrepreneurship.
- Fostering an “inside-out” approach to creating winning commercial ventures from cutting-edge research and promising ideas for the benefit of society; and
- Developing an extensive, vibrant network of alumni entrepreneurs.

How you can get involved:

- **LEARN.** Cross-disciplinary courses and experiential learning programs, like our startup incubator Project Olympus, are just a few of the ways we help students, faculty, and staff take their idea to the next level.
- **MENTOR.** Whether it’s coaching a team in the McGinnis Venture Competition or reviewing business models during office hours, mentors contribute to the success of our entrepreneurs at a crucial stage in their careers. We are always seeking new mentors and industry partners to work with us.
- **INVEST.** Investors are the backbone of many of our programs and activities; investments offer business leaders the opportunity to get in on the ground floor of winning ventures.



Project Olympus
Startup Incubator Program
cmu.edu/olympus



Innovation Scholars



James R. Swartz
Entrepreneurial Fellows



Innovation Fellows



NSF I-Corps



CONNECTS



McGinnis Venture
Competition



Entrepreneurs-in-Residence

Learn more at
cmu.edu/entrepreneurship

or contact
Swartz Center Staff
at swartzcenter@andrew.cmu.edu

Calling all thinkers, researchers, hackers, hustlers, makers, designers, and doers!

Our entrepreneurial programs are meant for everyone from all schools at all stages. Whether it's just an idea, a full-fledged product, or you just have that entrepreneurial spirit, there's a place for you here in the Swartz Center for Entrepreneurship.



Project Olympus Incubator/Accelerator *for students, faculty, and staff*

Encourages and supports entrepreneurship on campus by helping students, faculty, and staff turn their cutting-edge research and great ideas into startup companies.

Programs



Innovation Scholars *for undergraduate students*

Attracts the best and brightest of the next generation's innovative thinkers and doers



James R. Swartz Entrepreneurial Fellows *for graduate students*

Selects and trains those who have a passion for fusing technology with business



Innovation Fellows *for postdocs and senior graduate students*

Accelerates the process of commercializing university research



NSF I-Corps Site @ CMU

Recruits exploratory business ventures started by faculty, staff, students, and alumni

Workshops & Talks

CONNECTS / Smart Start Workshops *for everyone*

Presents in-depth workshops and seminars exploring entrepreneurship, innovation, and business law

Swartz Leadership Speaker Series *for everyone*

Invites entrepreneurial thought leaders to discuss issues central to entrepreneurial leadership

Entrepreneurial Boot Camp *for everyone*

Focuses on design thinking, idea screening, and entrepreneurial resources at CMU and in Pittsburgh

Inside-Out Commercialization *for graduate students, postdocs, and faculty*

Presents various aspects of business processes for moving research to the marketplace

Events & Competitions

McGinnis Venture Competition *for undergraduate and graduate students*

Gives students the opportunity to pitch their ideas to entrepreneurs and venture capitalists

Olympus Show & Tell *for everyone*

Highlights students and faculty presenting their research and nascent business explorations

Launch CMU *for everyone*

Showcases research and entrepreneurship for the investment and alumni communities

Global Entrepreneurship Week *for everyone*

Brings together events such as pitch events, panel discussions, workshops, and a startup job fair

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