

ELECTIVES FOR CS MAJORS

ALGORITHMS AND COMPLEXITY

15455*	Undergraduate Complexity Theory
21301	Combinatorics
21484	Graph Theory

LOGIC & LANGUAGES

15312*	Foundations of Programming Languages
15316*	Software Foundations of Security and Privacy
17355*	Program Analysis (currently approved for Spring 2018 only)
80311	Undecidability and Incompleteness (for students entering CMU prior to 2017)

SYSTEMS

15410*	Operating System Design and Implementation
15418*	Parallel Computer Architecture and Programming
15440*	Distributed Systems

APPLICATIONS

02250*	Introduction to Computational Biology (for students entering CMU in 2017) (for students entering CMU prior to 2017, 02250 counts as a science elective)
02510*	Computational Genomics (for students entering CMU prior to 2017) (for students entering CMU in 2017, 02510 counts as an SCS elective only)
05391*	Designing Human Centered Software
10401*	Introduction to Machine Learning (recommended) – or 10-601
11411*	Natural Language Processing
15323*	Computer Music Systems and Information Processing
15462*	Computer Graphics
16385*	Computer Vision

SCS UNDERGRADUATE ELECTIVES (in addition to SCS courses marked * above)

02425	Computational Methods for Proteogenomics and Metabolomics
02450	Automation of Biological Research
02518	Computational Medicine
05320	Social Web
05392	Interaction Design Overview
05410	User-Centered Research and Evaluation
05418	Design Educational Games
05430	Programming Usable Interfaces
05435	Advanced Fabrication Techniques for HCI
05470	Digital Service Innovation
05540	Rapid Prototyping of Computer Systems
05588	Undergraduate Small Group Study in HCI (Campus Stress As a Wicked Problem)
08303	Cryptocurrencies, Blockchains and Applications
08421	Building User-focused Sensing Systems
08534/05436	Usable Privacy and Security
08537	Advances in Artificial Intelligence for Social Good
10405	Machine Learning with Large Datasets
11344/05434	Machine Learning in Practice
11423	ConLanging: Lrng. Ling. And Lang. Tech. via Constr. Artif. Lang.
11441	Machine Learning for Text Mining
11442	Search Engines
15294	Rapid Prototyping Technologies [IDEATE Course] [Mini-1: 5 units]**
15295	Competition Programming and Problem Solving [5 units]**
15319	Cloud Computing
15387	Computational Perception
15388	Practical Data Science
15390	Entrepreneurship for Computer Science
15394	Intermediate Rapid Prototyping [IDEATE Course] [Mini-2: 5 units]**
15400	Research Practicum in Computer Science
15412	Operating System Practicum
15417	HOT Compilation
15465	Animation Art and Technology
15494	Cognitive Robotics: The Future of Robot Toys
15503	Introduction to Cryptography
15539	Independent Study in Computer Science Pedagogy
16264	Humanoids
16299	Introduction to Feedback Control Systems
16311	Introduction to Robotics
16350	Planning Techniques for Robotics
16374	Art of Robotic Special Effects [IDEATE Course]
16425	Medical Image Analysis
16455	Human-Machine Virtuosity
17214	Principles of Software Construction: Objects, Design & Concurrency
17356	Startup Engineering
17413	Software Engineering Practicum
17437	Web Application Development

**NOTE: Courses less than 9 units should be paired together to form a full SCS elective of at least 9 units.