

## ELECTIVES FOR CS UNDERGRADUATES

### ALGORITHMS AND COMPLEXITY

15354*	Computational Discrete Mathematics
15453*	Formal Languages, Automata, and Computability
15456*	Computational Geometry
21301	Combinatorics

### LOGIC & LANGUAGES

15317*	Constructive Logic
15414*	Bug Catching: Automated Program Verification and Testing
21300	Basic Logic
80310	Formal Logic

### SYSTEMS

15410*	Operating System Design and Implementation
15411*	Compiler Design
15418*	Parallel Computer Architecture and Programming
15440*	Distributed Systems
15441*	Computer Networks

### APPLICATIONS

05391*	Designing Human Centered Software
10601*	Introduction to Machine Learning
11411*	Natural Language Processing
15313*	Foundations of Software Engineering
15322*	Introduction to Computer Music
15381*	Artificial Intelligence: Representation and Problem Solving
15462*	Computer Graphics
16384*	Robot Kinematics and Dynamics

## UNDERGRADUATE SCS ELECTIVES

### in addition to SCS courses marked \* above

02450	Automation of Biological Research
02512	Computational Methods for Biological Modeling and Simulation
05392	Interaction Design Overview
05410	User-Centered Research and Evaluation
05413	Human Factors
05430	Programming Usable Interfaces
05431	Software Structures for User Interfaces
05452	Service Design
05499	Special Topics in HCI (5 sections: Crowd Computing, Twitch Plays Game Design, Computing for Good, Persuasive Design, Accessibility)
05588	Undergraduate Small Group Study in HCI (Campus Stress As a Wicked Problem)
08530	Pervasive and Ubiquitous Computing
11291 (tentative)	Computational Intelligence Lab (formerly 15-291)
11344/05434	Machine Learning in Practice
11421	Grammars and Lexicons
11441	Machine Learning for Text Mining
11442	Search Engines
11492	Speech Processing
15214	Principles of Software Construction: Objects, Design & Concurrency
15239	Special Topic: Software Development for Social Good
15294	Rapid Prototyping Technologies [IDEATE Course] [Mini-1: 5 units]**
15295	Competition Programming and Problem Solving [5 units]**
15319	Cloud Computing
15394	Intermediate Rapid Prototyping [IDEATE Course] [Mini-2: 5 units]**
15412	Operating System Practicum
15421	Information Security and Privacy
15437	Web Application Development
15445	Database Systems (NEW!)
15458	Discrete Differential Geometry (NEW!)
15463	Computational Photography
15487	Introduction to Computer & Network Security & Applied Cryptography
15539	Independent Study in Computer Science Pedagogy
16362	Mobile Robot Programming Laboratory
16375	Robotics for Creative Practice [IDEATE Course]
16450	Robotics Systems Engineering

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