

Bachelor of Science in Computer Science + Economics

The College of Arts & Sciences and the McKelvey School of Engineering have developed a new major that allows students interested in both economics and computer science to combine these two complementary disciplines efficiently, without having to pursue them as two separate majors.

Course Requirements*

Code	Title	Units
Math 131	Calculus I (AP credit may satisfy this requirement)	3
Math 132	Calculus II (AP credit may satisfy this requirement)	3
Math 233	Calculus III	3
SDS 3200	Elementary to Intermediate Statistics and Data Analysis**	3
or ESE 326	Probability and Statistics for Engineering	
or SDS 3211	Statistics for Data Science I	
CSE 131	Introduction to Computer Science	3
CSE 240	Logic and Discrete Mathematics	3
or Math 310	Foundations for Higher Mathematics	
or Math 310W	Foundations For Higher Mathematics With Writing	
CSE 247	Data Structures and Algorithms	3
CSE 347	Analysis of Algorithms	3
Econ 1011	Introduction to Microeconomics (AP credit may satisfy this requirement)	3
Econ 1021	Introduction to Macroeconomics (AP credit may satisfy this requirement)	3
Econ 4011	Intermediate Microeconomic Theory	3
Econ 413	Introduction to Econometrics	3
or Econ 413W	Introduction to Econometrics with Writing	
Total Units		36

* Each of these core courses must be passed with a grade of C- or better.

**Of these options, SDS 3200 is the preferred course.

Electives

Six upper-level approved courses from the Department of Economics and Computer Science & Engineering (CSE) are required: three from Economics and three from CSE. Students who have AP credits to satisfy the requirements for Econ 1011 Introduction to Microeconomics and/or Econ 1021 Introduction to Macroeconomics can instead take approved electives in either department, and they can add at most one approved course from outside both departments.

Economics Electives

Three 3-unit economics electives drawn from any Econ 4011 Intermediate Microeconomic Theory prerequisite course, including Econ 4021 Intermediate Macroeconomic Theory, are required.

Economics electives of particular relevance include (but are not limited to) Econ 407 Market Design, Econ 4151 Applied Econometrics, Econ 4160 Topics in Econometrics: Microeconometrics, Econ 452 Industrial Organization, Econ 4567 Auction Theory and Practice, Econ 467 Game Theory, and Econ 484 Computational Macroeconomics.

Computer Science Electives

Code	Title	Units
CSE 217A	Introduction to Data Science	3
CSE 311A	Introduction to Intelligent Agents Using Science Fiction	3
CSE 314A	Data Manipulation and Management	3
CSE 330S	Rapid Prototype Development and Creative Programming	3
CSE 332S	Object-Oriented Software Development Laboratory	3
CSE 341T	Parallel and Sequential Algorithms	3
CSE 400E	Independent Study (must be approved by CSE CS+Econ director)	3
CSE 411A	AI and Society	3
CSE 412A	Introduction to Artificial Intelligence	3
CSE 416A	Data Science for Complex Networks	3
CSE 417T	Introduction to Machine Learning	3
or ESE 417	Introduction to Machine Learning and Pattern Classification	
CSE 419A	Introduction to AI for Health	3
CSE 425S	Programming Systems and Languages	3
CSE 427S	Cloud Computing with Big Data Applications	3
CSE 435S	Database Management Systems	3
CSE 457A	Introduction to Visualization	3
CSE 514A	Data Mining	3
CSE 517A	Machine Learning	3
CSE 518A	Human-in-the-Loop Computation	3
CSE 543T	Algorithms for Nonlinear Optimization	3
CSE 557A	Advanced Visualization	3

Additional Departmental Requirements

Code	Title	Units
CWP 100	College Writing	3
Engr 310	Technical Writing	3
Humanities and social sciences electives		18
Natural sciences electives		8

The College Writing Program, humanities, and social sciences requirements are those required of all students in the McKelvey School of Engineering. For information about how to fulfill the school's English proficiency requirement, please visit the Degree Requirements page.

The natural sciences requirement is for 8 units designated NSM (Natural Sciences and Mathematics) from any of the following departments: Anthropology, Biology, Chemistry, Earth and Planetary Sciences, Environmental Studies or Physics. The College Writing Program and natural sciences courses must be completed with a grade of C- or better.

All courses taken to meet any of the above requirements (with the exception of the humanities and social sciences electives) cannot be taken on a pass/fail basis.