

Economics and Computer Science Major

Program Requirements

- **Total units required:** 54

The College of Arts & Sciences and the McKelvey School of Engineering have developed a 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.

Engineering students who declare this major must fulfill the distribution requirements and all other requirements for the BS in Applied Science degree in the McKelvey School of Engineering. Arts & Sciences students who declare this major must fulfill the distribution requirements and all other requirements for an AB degree in addition to the specific requirements listed below. It is possible to earn the Financial Economics Specialization in conjunction with this major (prime or second), and interested students should consult with the Academic Coordinator (dottie@wustl.edu) in the Department of Economics.

Required Courses

| Code | Title | Units |
|--------------|---|-------|
| Econ 1011 | Introduction to Microeconomics | 3 |
| Econ 1021 | Introduction to Macroeconomics | 3 |
| Econ 4011 | Intermediate Microeconomic Theory | 3 |
| Econ 413 | Introduction to Econometrics | 3 |
| or Econ 413W | Introduction to Econometrics with Writing | |
| 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 SDS 3211 | Statistics for Data Science I | |
| or ESE 326 | Probability and Statistics for Engineering | |
| 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 |

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

Elective Courses

1. Three 3-unit economics electives drawn from any Econ 4011 prerequisite course, including Econ 4021
 - a. Economics electives of particular relevance include (but are not limited to) Econ 407 Market Design, Econ 4151 Applied Econometrics, Econ 4160 Topics in Econometrics: Microeconomics, Econ 452 Industrial Organization, Econ 4567 Auction Theory and Practice, Econ 467 Game Theory, and Econ 484 Computational Macroeconomics.
2. Three 3-unit computer science electives drawn from the list below:

| 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 | varies; max. 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 |

* Students planning to complete CSE 517A Machine Learning should try to complete CSE 417T Introduction to Machine Learning as the prerequisite course. Non-engineering students may substitute SDS 3200 Elementary to Intermediate Statistics and Data Analysis or SDS 3211 Statistics for Data Science I for the ESE 326 Probability and Statistics for Engineering prerequisite for ESE 417 Introduction to Machine Learning and Pattern Classification.

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