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*

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math 131</td>
<td>Calculus I (AP credit may satisfy this requirement)</td>
<td>3</td>
</tr>
<tr>
<td>Math 132</td>
<td>Calculus II (AP credit may satisfy this requirement)</td>
<td>3</td>
</tr>
<tr>
<td>Math 233</td>
<td>Calculus III Mathematical Economics</td>
<td>1-3</td>
</tr>
<tr>
<td>Math 3200</td>
<td>Elementary to Intermediate Statistics and Data Analysis</td>
<td>3</td>
</tr>
<tr>
<td>or ESE 326</td>
<td>Probability and Statistics for Engineering Statistics for Data Science</td>
<td></td>
</tr>
<tr>
<td>or Math 3211</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSE 131</td>
<td>Introduction to Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>CSE 247</td>
<td>Data Structures and Algorithms</td>
<td>3</td>
</tr>
<tr>
<td>CSE 240</td>
<td>Logic and Discrete Mathematics Foundations for Higher Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>CSE 347</td>
<td>Analysis of Algorithms</td>
<td>3</td>
</tr>
<tr>
<td>Econ 1011</td>
<td>Introduction to Microeconomics (AP credit may satisfy this requirement)</td>
<td>3</td>
</tr>
<tr>
<td>Econ 1021</td>
<td>Introduction to Macroeconomics (AP credit may satisfy this requirement)</td>
<td>3</td>
</tr>
<tr>
<td>Econ 4011</td>
<td>Intermediate Microeconomic Theory</td>
<td>3</td>
</tr>
<tr>
<td>Econ 413</td>
<td>Introduction to Econometrics</td>
<td>3</td>
</tr>
<tr>
<td>or Econ 413W</td>
<td>Introduction to Econometrics with Writing</td>
<td></td>
</tr>
</tbody>
</table>

Total Units: 34-36

* Each of these core courses must be passed with a grade of C- or better.
** Of these options, Math 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 452 Industrial Organization, Econ 4567 Auction Theory and Practice, Econ 467 Game Theory and Econ 484 Computational Macroeconomics.

Computer Science Electives

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>CWP 100</td>
<td>College Writing</td>
<td>3</td>
</tr>
<tr>
<td>Engr 310</td>
<td>Technical Writing</td>
<td>3</td>
</tr>
<tr>
<td>Humanities and social sciences electives</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Natural sciences electives</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

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 (http://bulletin.wustl.edu/undergrad/engineering/requirements/#engprofreq).

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.