DEPARTMENT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

Undergraduate Study

For MIT undergraduates, the Department of Electrical Engineering and Computer Science offers several programs leading to the Bachelor of Science:

- The 6-1 program (http://catalog.mit.edu/degree-charts/electrical-science-engineering-course-6-1) leads to the Bachelor of Science in Electrical Science and Engineering. It is accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org).
- The 6-2 program (http://catalog.mit.edu/degree-charts/electrical-engineering-computer-science-course-6-2) leads to the Bachelor of Science in Electrical Engineering and Computer Science and is for those whose interests cross this traditional boundary. It is accredited by both the Engineering and Computing Accreditation Commissions of ABET.
- The 6-3 program (http://catalog.mit.edu/degree-charts/computer-science-engineering-course-6-3) leads to the Bachelor of Science in Computer Science and Engineering. It is accredited by both the Engineering and Computing Accreditation Commissions of ABET.
- The 6-7 program (http://catalog.mit.edu/degree-charts/computer-science-molecular-biology-course-6-7), offered jointly by the Department of Electrical Engineering and Computer Science and the Department of Biology (Course 7), is for students specializing in computer science and molecular biology. A detailed description of this degree program and its requirements can be found in the section on Interdisciplinary Programs (http://catalog.mit.edu/interdisciplinary/undergraduate-programs/degrees/computer-science-molecular-biology).
- The 6-9 program (http://catalog.mit.edu/degree-charts/computation-cognition-6-9), offered jointly by the Department of Electrical Engineering and Computer Science and the Department of Brain and Cognitive Sciences (Course 9), focuses on the emerging field of computational and engineering approaches to brain science, cognition, and machine intelligence. A detailed description of this degree program and its requirements can be found in the section on Interdisciplinary Programs (http://catalog.mit.edu/interdisciplinary/undergraduate-programs/degrees/computation-cognition).
- The 6-14 program (http://catalog.mit.edu/degree-charts/computer-science-economics-data-science-course-6-14), offered jointly by the Department of Electrical Engineering and Computer Science and the Department of Economics (Course 14), is for students specializing in computer science, economics, and data science. A detailed description of this degree program and its requirements can be found in the section on Interdisciplinary Programs (http://catalog.mit.edu/interdisciplinary/undergraduate-programs/degrees/computer-science-economics-data-science).
- The 11-6 program (http://catalog.mit.edu/degree-charts/urban-science-planning-computer-science-11-6), offered jointly by the Department of Electrical Engineering and Computer Science and the Department of Urban Studies and Planning (Course 11), is for students specializing in urban science and planning with computer science. A detailed description of this degree program and its requirements can be found in the section on Interdisciplinary Programs (http://catalog.mit.edu/interdisciplinary/undergraduate-programs/degrees/urban-science-planning-computer-science).

The bachelor's programs in 6-1, 6-2, and 6-3 build on the General Institute Requirements in science and the humanities, and are structured to provide early, hands-on engagement with ideas, activities, and learning that allow students to experience the range and power of electrical engineering and computer science in an integrated way. The required introductory core subject (one of 6.01, 6.02, 6.03, and 6.08) involves substantial work in the laboratory. This subject is complemented by a mathematics subject, and followed by a choice of three foundation courses from a set of subjects that provide the basis for subsequent specialization. Students define their specialization by selecting three to four header subjects, two advanced undergraduate subjects, and one to two EECs elective subjects from an extensive set of possibilities. The flexibility in these choices permits students considerable latitude in shaping their program to match diverse interests, while ensuring depth and mastery in a few selected areas.

The joint bachelor's programs in 6-7 provides an interdepartmental curriculum involving rigorous training in both molecular biology and computer science. Students begin with introductory courses in math, chemistry, programming, and lab skills. Students then build on these skills with five courses in algorithms and biology, which lead to a choice of electives in biology, with a particular focus on computational biology.

The joint bachelor's program in 6-9 is designed to give students access to foundational and advanced material in electrical engineering and computer science, as well as in the architecture, circuits, and physiology of the brain, and computational approaches to cognition and intelligence.

The joint bachelor's program in 6-14 is designed to equip students with a foundational knowledge of economic analysis, computing, optimization, and data science, as well as hands-on experience with empirical analysis of economic data. Students take eight subjects that provide a mathematical, computational, and algorithmic basis for the major. From there, students take two subjects in data science, two in intermediate economics, and three elective subjects from data science and economics theory.
All students in 6-1, 6-2, 6-3, 6-7, or 6-9 may also apply for one of the Master of Engineering programs offered by the department, which require an additional year of study for the simultaneous award of both degrees.

Minor in Computer Science
The department offers a Minor in Computer Science. The minor provides students with both depth and breadth in the field, as well as the opportunity to explore areas of their own interest.

To complete the minor, students must take at least six subjects (six-unit subjects count as half-subjects) totaling at least 72 units from the lists below, including:

- at least one software-intensive subject, and
- one algorithms-intensive subject at either the basic or advanced level.

### Introductory Level
**Select up to 12 units of the following:**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0001</td>
<td>Introduction to Computer Science Programming in Python</td>
<td>6</td>
</tr>
<tr>
<td>6.0002</td>
<td>Introduction to Computational Thinking and Data Science</td>
<td>6</td>
</tr>
<tr>
<td>6.01</td>
<td>Introduction to EECS via Robotics</td>
<td>12</td>
</tr>
<tr>
<td>6.02</td>
<td>Introduction to EECS via Communication Networks</td>
<td>12</td>
</tr>
<tr>
<td>6.08</td>
<td>Introduction to EECS via Interconnected Embedded Systems</td>
<td>12</td>
</tr>
</tbody>
</table>

### Basic Level
**Select up to 63 units of the following:**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.004</td>
<td>Computation Structures</td>
<td>12</td>
</tr>
<tr>
<td>6.008</td>
<td>Introduction to Inference</td>
<td>12</td>
</tr>
<tr>
<td>6.034</td>
<td>Artificial Intelligence</td>
<td>12</td>
</tr>
<tr>
<td>6.041</td>
<td>Introduction to Probability</td>
<td>12</td>
</tr>
<tr>
<td>18.200</td>
<td>Principles of Discrete Applied Mathematics</td>
<td>12</td>
</tr>
<tr>
<td>18.200A</td>
<td>Principles of Discrete Applied Mathematics</td>
<td>15</td>
</tr>
<tr>
<td>18.211</td>
<td>Combinatorial Analysis</td>
<td>12</td>
</tr>
</tbody>
</table>

**Algorithms-intensive**
6.046[J] Design and Analysis of Algorithms 12

**Software-intensive**
6.031 Elements of Software Construction 15
6.035 Computer Language Engineering 12
6.170 Software Studio 15
6.172 Performance Engineering of Software Systems 18
6.175 Constructive Computer Architecture 12
6.809[J] Interactive Music Systems 12
6.816 Multicore Programming 12

### Advanced Level
**Select at least 12 units of the following:**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.033</td>
<td>Computer Systems Engineering</td>
<td>12</td>
</tr>
<tr>
<td>6.036</td>
<td>Introduction to Machine Learning</td>
<td>12</td>
</tr>
</tbody>
</table>

**Algorithms-intensive**
6.045[J] Automata, Computability, and Complexity 12
6.046[J] Design and Analysis of Algorithms 12
6.047 Computational Biology: Genomes, Networks, Evolution 12
6.801 Machine Vision 12
6.803 The Human Intelligence Enterprise 12
6.806 Advanced Natural Language Processing 12
6.811[J] Principles and Practice of Assistive Technology 12
6.814 Database Systems 12
6.815 Digital and Computational Photography 12
6.819 Advances in Computer Vision 12
6.837 Computer Graphics 12
6.905 Large-scale Symbolic Systems 12
18.404 Theory of Computation 12

**Software-intensive**
6.031 Elements of Software Construction 15
6.035 Computer Language Engineering 12
6.170 Software Studio 15
6.172 Performance Engineering of Software Systems 18
6.175 Constructive Computer Architecture 12
6.809[J] Interactive Music Systems 12
6.816 Multicore Programming 12

**Inquiries**
Additional information about the department’s undergraduate programs may be obtained from the EECS Undergraduate Office (ug@eecs.mit.edu), Room 38-476, 617-253-7329.