COMPUTER SCIENCE MAJOR

ADMISSION TO THE MAJOR
To declare the computer science major, a student must have

- earned a C or higher in COMP 211;
- either earned a C or higher in COMP 212 or be enrolled in COMP 212 and be earning a grade of C or higher based on completed work; and
- either earned a C or higher in MATH 228 or MATH 261 or be enrolled in MATH 228 or MATH 261 and be earning a grade of C or higher based on completed work.

Note: The MATH 228 or MATH 261 requirement applies to students declaring the COMP major after June 30, 2016.

MAJOR REQUIREMENTS
To complete the computer science major, a student must complete the following courses:

<table>
<thead>
<tr>
<th>Required Courses</th>
<th>Credits</th>
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<tbody>
<tr>
<td>COMP 211 Computer Science I</td>
<td>1</td>
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<tr>
<td>COMP 212 Computer Science II</td>
<td>1</td>
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<tr>
<td>COMP 301 Automata Theory and Formal Languages</td>
<td>1</td>
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<tr>
<td>COMP 312 Algorithms and Complexity</td>
<td>1</td>
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<tr>
<td>COMP 321 Design of Programming Languages</td>
<td>1</td>
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<tr>
<td>COMP 331 Computer Structure and Organization</td>
<td>1</td>
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<tr>
<td>MATH 228 Discrete Mathematics</td>
<td>1</td>
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<tr>
<td>or MATH 261 Abstract Algebra: Groups, Rings, and Fields</td>
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<tr>
<td>MATH 221 Vectors and Matrices</td>
<td>1</td>
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<tr>
<td>or MATH 223 Linear Algebra</td>
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Select two additional electives                      | 2       |

Notes:

- Any COMP course at the 300+ level except COMP 409-410 can be used as an elective for the major.
- At most, one individual or group tutorial may be used as an elective unless prior approval is given.
- Only 1.0-credit courses taken A–F may be used to satisfy major requirements.

STUDENT LEARNING GOALS

- Understanding abstraction: At its heart, computer science is the study of abstractions for the purpose of understanding computation, and as such students must learn appropriate levels of abstraction for solving computational problems. All courses in the curriculum contribute to this goal.
- Programming: Students must learn how to program in a high-level language, as such programming is the primary tool in computer science. This is typically how students are first exposed to the field, and our majors achieve this goal in the freshman or sophomore year by taking the gateway sequence COMP 211–212.
- Analysis: Students must learn how to reason about computation; this includes analyzing algorithms and proving properties such as correctness and complexity, and requires an understanding of appropriate mathematical tools. The courses that focus primarily on this goal are COMP 312 (Design and Analysis of Algorithms) and COMP 321 (Design of Programming Languages).
- Creation: Students must learn how to create original computational structures; this requires an understanding of fundamental techniques in algorithm and data structure design and an ability to combine established techniques in novel ways. All courses in the curriculum contribute to this goal.
- Limits: Students must understand not only how to analyze and create computational structures, but also the limits of computation itself; this requires an understanding of the mathematical foundations and formalisms of computer science. This goal is primarily addressed in COMP 301 (Automata Theory and Formal Languages).

RELATED PROGRAMS OR CERTIFICATES
Informatics and Modeling Certificate. The department is an active participant in the Informatics and Modeling Certificate (wesleyan.edu/imcp). The certificate provides a framework to guide students in developing analytical skills based on the following two pathways:

- Computational Science and Quantitative World Modeling (CSM): wesleyan.edu/imcp/csm.html
- Integrative Genomic Sciences (IGS): wesleyan.edu/imcp/igs.html

The CSM pathway introduces students to modeling techniques and provides students with a foundation in the quantitative simulation, evaluation, and prediction of natural and social phenomena. The IGS pathway introduces students to the interdisciplinary field of bioinformatics and its relationships to molecular genomics, evolution, structural biology, and bioethics. The department offers courses that support both pathways, such as COMP 211 and COMP 212, and also offers special interdisciplinary courses for the IGS pathway, such as COMP 327 and COMP 350. The certificate requirements are described in the links for the two pathways.

BA/MA PROGRAM
This program provides an attractive option for mathematics majors to enrich their course and research background. Students are advised to begin research by their junior year if they intend to pursue the BA/MA. Admission is competitive and based on GPA, faculty recommendations, and research experience. For more information, visit wesleyan.edu/grad/degree-programs/ba-ma.html. Advanced undergraduates may enroll in graduate (500-level) courses.

ADDITIONAL INFORMATION

COLLOQUIA AND SEMINARS
Lectures. The departmental colloquium series presents lectures on recent research by invited speakers from other institutions. Advanced undergraduates are welcome and encouraged to attend these colloquia and to participate in the computer science seminar.

HONORS
An undergraduate may achieve the BA with honors in computer science via the following route:

- The honors thesis, written under the supervision of a faculty member under conditions monitored by the University Committee on Honors.