COMPUTER SCIENCE MINOR (WEINBERG COLLEGE)

The program offers a minor in computer science for students who wish to develop a strong competence in computer science while majoring in another area.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>MATH 220-1 &amp; MATH 220-2</td>
<td>Single-Variable Differential Calculus and Single-Variable Integral Calculus</td>
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<tr>
<td>MATH 218-1 &amp; MATH 218-2</td>
<td>Single-Variable Calculus with Precalculus and Single-Variable Calculus with Precalculus</td>
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<tr>
<td>MATH 230-1</td>
<td>Multivariable Differential Calculus or MATH 228-1 Multivariable Differential Calculus for Engineering</td>
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<tr>
<td>MATH 240-0</td>
<td>Linear Algebra</td>
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Minor Requirements (9 units)

6 core courses

COMP_SCI 101-0 Computer Science: Concepts, Philosophy, and Connections

Or an additional course from the breadth course lists.

COMP_SCI 111-0 Fundamentals of Computer Programming

COMP_SCI 211-0 Fundamentals of Computer Programming II

COMP_SCI 212-0 Mathematical Foundations of Comp Science

COMP_SCI 213-0 Introduction to Computer Systems

COMP_SCI 214-0 Data Structures & Algorithms

3 breadth courses in 3 separate breadth areas (see below)

1 Students without programming experience may want to first take COMP_SCI 110-0 Introduction to Computer Programming, ideally in the Python programming language.

Breadth Courses

Majors must take one course from each area. Minors must take one course from each of any three areas.

Theory

Course    | Title                                    |
-----------|------------------------------------------|
COMP_SCI 335-0 | Introduction to the Theory of Computation |
COMP_SCI 336-0 | Design & Analysis of Algorithms |

Systems

Course    | Title                                    |
-----------|------------------------------------------|
COMP_SCI 322-0 | Compiler Construction |
COMP_SCI 339-0 | Introduction to Database Systems |
COMP_SCI 340-0 | Introduction to Networking |
COMP_SCI 343-0 | Operating Systems |
COMP_SCI 345-0 | Distributed Systems |
COMP_SCI 350-0 | Introduction to Computer Security |
COMP_SCI 354-0 | Network Penetration & Security |
COMP_SCI 440-0 | Advanced Networking |
COMP_SCI 441-0 | Resource Virtualization |
COMP_SCI 443-0 | Advanced Operating Systems |
COMP_SCI 446-0 | Kernel and Other Low-level Software Development |
COMP_SCI 450-0 | Internet Security |
COMP_ENG 303-0 | Advanced Digital Design |
COMP_ENG 346-0 | Microprocessor System Design |

Artificial Intelligence

Course    | Title                                    |
-----------|------------------------------------------|
COMP_SCI 325-1 | Artificial Intelligence Programming |
COMP_SCI 337-0 | Natural Language Processing |
COMP_SCI 344-0 | Design of Computer Problem Solvers |
COMP_SCI 348-0 | Introduction to Artificial Intelligence |
COMP_SCI 349-0 | Machine Learning |
COMP_SCI 371-0 | Knowledge Representation and Reasoning |
COMP_SCI 372-0 | Designing & Constructing Models with Multi-Agent Language |

Interfaces

Course    | Title                                    |
-----------|------------------------------------------|
COMP_SCI 313-0 | Tangible Interaction Design and Learning |
COMP_SCI 315-0 | Design, Technology, and Research |
COMP_SCI 330-0 | Human Computer Interaction |
COMP_SCI 331-0 | Introduction to Computational Photography |
COMP_SCI 351-1 | Introduction to Computer Graphics |
COMP_SCI 352-0 | Machine Perception of Music & Audio |
COMP_SCI 370-0 | Computer Game Design |
COMP_SCI 376-0 | Computer Game Design and Development |
COMP_SCI 377-0 | Game Design Studio |
ELEC_ENG 332-0 | Introduction to Computer Vision |

Software Development and Programming Languages

Course    | Title                                    |
-----------|------------------------------------------|
COMP_SCI 321-0 | Programming Languages |
COMP_SCI 338-0 | Practicum in Intelligent Information Systems |
COMP_SCI 377-0 | Game Design Studio |
COMP_SCI 393-0 | Software Construction |
COMP_SCI 394-0 | Agile Software Development |
COMP_SCI 473-1 | NUvention: Web - Part 1 |
COMP_SCI 473-2 | NUvention: Web - Part 2 |

Students should begin the minor before the end of the first quarter of their junior year.