COMPETUAL 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.

**Course** | **Title** | **Prerequisites**
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MATH 220-1 & MATH 220-2 | Single-Variable Differential Calculus and Single-Variable Integral Calculus
or MATH 218-1 & MATH 218-2 & MATH 218-3 | Single-Variable Calculus with Precalculus and Single-Variable Calculus with Precalculus and Single-Variable Calculus with Precalculus
MATH 230-1 | Multivariable Differential Calculus
or MATH 228-1 | Multivariable Differential Calculus for Engineering
MATH 240-0 | Linear Algebra

**Minor Requirements (9 units)**

- 6 core courses
  - COMP_SCI 111-0 Fundamentals of Computer Programming
  - COMP_SCI 150-0 Fundamentals of Computer Programming 1.5
  - 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**
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COMP_SCI 335-0 | Introduction to the Theory of Computation
COMP_SCI 336-0 | Design & Analysis of Algorithms

**Systems**

**Course** | **Title**
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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 | Computer System 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

COMP_ENG 358-0 | Introduction to Parallel Computing
COMP_ENG 361-0 | Computer Architecture I

**Artificial Intelligence**

**Course** | **Title**
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COMP_SCI 325-0 | 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 and Constructing Models with Multi-Agent Languages

**Interfaces**

**Course** | **Title**
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COMP_SCI 313-0 | Tangible Interaction Design and Learning
COMP_SCI 315-0 | Design, Technology, and Research
COMP_SCI 329-0 | HCI Studio
COMP_SCI 330-0 | Human Computer Interaction
COMP_SCI 331-0 | Introduction to Computational Photography
COMP_SCI 333-0 | Interactive Information Visualization
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 372-0 | Designing and Constructing Models with Multi-Agent Languages
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**
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COMP_SCI 310-0 | Scalable Software Architectures
COMP_SCI 321-0 | Programming Languages
COMP_SCI 338-0 | Practicum in Intelligent Information Systems
COMP_SCI 377-0 | Game Design Studio
COMP_SCI 392-0 | Rapid Prototyping for Software Innovation
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.