## Additional Major in Physics for Students Entering up through 2014

### Prerequisites
This subset of the MCS Core must be taken as prerequisites for the second-year Physics Core.

- 33-106: Physics I for Engineering
- 33-111: Physics I for Science Students
- 33-131: Matter and Interactions I
- 33-107: Physics II for Engineering
- 33-112: Physics II for Science Students
- 33-132: Matter and Interactions II
- 21-120: Differential and Integral Calculus
- 21-122: Integration, Diff. Eq., and Approx.
- 15-112: Fund. of Programming & CS

### Physics Core
All Physics majors take these Physics and Mathematics courses to prepare for individualized tracks of study, including four colloquia courses.

- 33-104: Experimental Physics
- 33-201: Physics Sophomore Colloquium I
- 33-202: Physics Sophomore Colloquium II
- 33-211: Physics III: Modern Essentials
- 33-228: Electronics I
- 33-231: Physical Analysis
- 33-232: Mathematical Methods of Physics
- 33-234: Quantum Physics
- 21-259: Calculus in Three Dimensions
- 33-301: Physics Upperclass Colloquium I
- 33-302: Physics Upperclass Colloquium II
- 33-331: Physical Mechanics I
- 33-338: Int. Electricity and Magnetism I
- 33-340: Modern Physics Laboratory
- 33-341: Thermal Physics I

### Physics and Mathematics Electives
These Physics and Mathematics Electives may be chosen freely, but the tracks on the following pages are designed to support specific careers.

- Physics Breadth Elective
- Qualifying Physics Elective
- Qualifying Physics Elective
- Qualifying Physics Elective
- Mathematics Elective

### Key
- Required Course
- Select One Course
Additional Major in Physics Tracks, Page 1

**Graduate School Preparation**
Regardless of track, students planning to undertake graduate studies in Physics are strongly advised to take the following four courses.

- 33-332: Physical Mechanics II
- 33-339: Intermed. Electricity & Magnetism II
- 33-445: Advanced Quantum Physics I
- 33-446: Advanced Quantum Physics II

*Note: These courses may be used as Qualifying Physics, Technical, or Free Electives.*

**No Track**
Physics students wanting maximum freedom can opt not to select a track. While there is significant flexibility, there are breadth requirements.

- Physics Breadth Elective
- Qualifying Physics Elective
- Qualifying Physics Elective
- Qualifying Physics Elective
- Mathematics Elective
- Technical Elective
- Technical Elective
- Technical Elective
- Technical Elective

**Applied Physics Track**
Students aiming for a career path in industrial or governmental laboratories can take this track to enhance computing and laboratory skills.

- 33-448: Introduction to Solid State Physics
- Computational Science Elective
- Applied Physics or Laboratory Elective
- Applied Physics or Laboratory Elective
- Applied Physics or Laboratory Elective
- Applied Physics or Laboratory Elective
- Mathematics Elective

**Astrophysics Track**
Students planning careers or postgraduate work in astronomy or astrophysics can follow this track to gain a strong background in the field.

- 33-224: Stars, Galaxies and the Universe
- 33-466: Extragalactic Astrophysics and Cosmology
- 33-467: Astrophysics of Stars and the Galaxy
- 33-350: Undergraduate Research
- 33-451: Senior Research related to applied physics
- Mathematics Elective
- Technical Elective
- Technical Elective
- Technical Elective

**Key**
- Required Course
- Select One Course
- Recommended Course
Additional Major in Physics Tracks, Page 2

**Graduate School Preparation**
Regardless of track, students planning to undertake graduate studies in Physics are strongly advised to take the following four courses:

- 33-332: Physical Mechanics II
- 33-339: Interm. Electricity & Magnetism II
- 33-445: Advanced Quantum Physics I
- 33-446: Advanced Quantum Physics II

*Note: These courses may be used as Qualifying Physics, Technical, or Free Electives.*

**Biological Physics Track**
Students preparing for careers in biological or medical physics or graduate work in biophysics can broaden their major with this track.

- 33-441: Introduction to Biophysics
- Qualifying Physics Elective
- Mathematics Elective
- 03-231: Biochemistry I
- 09-217: Organic Chemistry I
- 09-218: Organic Chemistry II
- Biological Sciences Elective
- Biological Sciences Elective

**Chemical Physics**
Students planning graduate studies with an emphasis on chemical physics or a health profession may be interested in this track.

- 33-441: Introduction to Biophysics
- Qualifying Physics Elective
- Mathematics Elective
- 09-217: Organic Chemistry I
- 09-218: Organic Chemistry II
- 09-344: Physical Chemistry (Quantum)
- 09-345: Physical Chemistry (Thermo)
- Chemistry Elective
- Chemistry Elective
- Chemistry Elective

**Computational Physics Track**
Students can strengthen their grounding in the foundations and practice of computer use as applied to scientific problems with this track.

- 33-241: Introduction to Computational Physics
- Qualifying Physics Elective
- Mathematics Elective
- 21-127: Concepts of Mathematics
- 21-369: Numerical Methods
- 15-122: Principles of Imperative Computation
- 15-150: Functional Programming

**Key**

- : Required Course
- : Select One Course
- : Recommended Course