Additional Major in Physics for Students Entering from 2015

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

- 21-120: Differential and Integral Calculus
- 21-122: Integration, Diff. Eq., and Approx.

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

- 21-120: Differential and Integral Calculus
- 33-104: Experimental Physics
- 33-106/-141: Physics I for Eng.
- 33-121: Physics I for Science Students
- 33-151: Matter and Interactions I
- 33-142: Physics II for Eng. or Physics
- 33-152: Matter and Interactions II
- 33-104: Experimental Physics
- 15-112: Fund. of Computing & CS
- 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

**Track**
These Physics, Mathematics, and Technical electives determine your track. The following pages have overviews of each track.

- Physics Breadth Elective
- Select One Course
- Select One Course
- Select One Course
- Mathematics Elective
- Technical Elective
- Technical Elective
- Technical Elective
### 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**

### 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**
- **Course enhancing computer usage as a tool in a research environment**
- **Non-Physics course broadening laboratory skills**
- **Course in any department broadening laboratory skills**
- **Non-Physics course applying physics principles to solving problems**
- **Course in any department applying physics principles to solving problems**
- **33-350: Undergraduate Research**
- **33-451: Senior Research related to applied physics**

### 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 astrophysics**
- **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: 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.*

**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.

- 33-241: Introduction to Computational Physics
- Mathematics Elective
- 09-106: Modern Chemistry II
- 09-344: Physical Chemistry (Quantum)
- 09-345: Physical Chemistry (Thermo)
- Chemistry Elective
- Chemistry Elective

**Chemical Physics**
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
- Mathematics Elective
- 09-106: Modern Chemistry II
- 09-344: Physical Chemistry (Quantum)
- 09-345: Physical Chemistry (Thermo)
- Chemistry Elective
- Chemistry Elective

**Key**
- : Required Course
- : Select One Course
- : Recommended Course