### 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.

#### Physics Core

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-120</td>
<td>Differential and Integral Calculus</td>
</tr>
<tr>
<td>21-122</td>
<td>Introduction to Data, Math, and Approx.</td>
</tr>
<tr>
<td>33-228</td>
<td>Electronics I</td>
</tr>
<tr>
<td>33-231</td>
<td>Physical Analysis</td>
</tr>
<tr>
<td>33-232</td>
<td>Mathematical Methods of Physics</td>
</tr>
<tr>
<td>33-234</td>
<td>Quantum Physics</td>
</tr>
<tr>
<td>33-331</td>
<td>Physical Mechanics I</td>
</tr>
<tr>
<td>33-338</td>
<td>Intermediate Electricity and Magnetism I</td>
</tr>
<tr>
<td>33-340</td>
<td>Modern Physics Laboratory</td>
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<tr>
<td>33-341</td>
<td>Thermal Physics I</td>
</tr>
<tr>
<td>33-342</td>
<td>Modern Physics Laboratory II</td>
</tr>
<tr>
<td>33-343</td>
<td>Matter and Interactions I</td>
</tr>
<tr>
<td>33-344</td>
<td>Matter and Interactions II</td>
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<tr>
<td>33-345</td>
<td>Physical Mechanics II</td>
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<td>33-346</td>
<td>Experimental Physics</td>
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<tr>
<td>33-347</td>
<td>Modern Physics III: Modern Essentials</td>
</tr>
<tr>
<td>33-351</td>
<td>Physics Lab for Science Students</td>
</tr>
<tr>
<td>33-352</td>
<td>Physics Core: Additional Minor for College Core, including Introductory Needs of Study, Analytical Mechanics, and Additional Courses to Prepare for All Physics Majors Taking These Physics Courses</td>
</tr>
</tbody>
</table>

#### Mathematics Electives

- These may be chosen freely, but the tracks on the following pages are designed to support specific careers.

#### Qualifying Physics Electives

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

#### Mathematics Electives

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#### Qualifying Mathematics Elective

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#### Mathematics Elective

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### 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**
- **Computational Science Elective**
- **Applied Physics or Laboratory Elective**
- **Applied Physics or Laboratory Elective**
- **Applied Physics or Laboratory Elective**
- **Technical Elective**
- **Technical Elective**
- **Technical 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 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
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*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.

- 33-445: Advanced Computational Physics
- Mathematics Elective
- 09-106: Modern 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
- Mathematics Elective
- 09-106: Modern Chemistry II
- 09-344: Physical Chemistry (Quantum)
- 09-345: Physical Chemistry (Thermo)
- Chemistry Elective
- Chemistry Elective
- Chemistry Elective

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