## 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.

# Key Required Course Select One Course

#### **Physics Core**

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

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

15-110: Principles of Computing 15-112: Fund. of Computing & CS

33-201: Physics Sophomore Colloquium I

33-211: Physics III: Modern Essentials

33-231: Physical Analysis

33-202: Physics Sophomore Colloquium II

33-228: Electronics I

33-232: Mathematical Methods of Physics

33-234: Quantum Physics

21-259: Calculus in Three Dimensions

33-301: Physics Upperclass Colloquium I

33-331: Physical Mechanics I

33-338: Int. Electricity and Magnetism I

33-341: Thermal Physics I

33-302: Physics Upperclass Colloquium II

33-340: Modern Physics Laboratory

#### **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

## 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

#### **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

33-350: Undergraduate Research 33-451: Senior Research related to applied physics

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

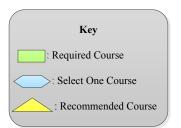
33-350: Undergraduate Research 33-451: Senior Research related to astrophysics

Mathematics Elective

Technical Elective

Technical Elective

Technical Elective



## 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.

Physics Breadth Elective

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

33-456: Advanced Computational Physics

Physics Breadth Elective

Qualifying Physics Elective

21-127: Concepts of Mathematics

21-369: Numerical Methods

15-122: Principles of Imperative Computation

15-150: Functional Programming

