Physics B.S. Curriculum for Students Entering up through 2014

CMU / MCS Science Core

All MCS students must complete these core courses by the end of their Junior year. Computing @ Carnegie Mellon must be completed in the first year.

99-101 / -102 / -103: Computing @ CMU

33-111: Physics I for Science Students 33-131: Matter and Interactions I

33-112: Physics II for Science Students 33-132: Matter and Interactions II

03-121: Modern Biology

09-105: Introduction to Modern Chemistry I

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

21-120: Differential and Integral Calculus

21-122: Integration, Diff. Eq., and Approx.

MCS Distribution

All MCS students take both constrained and free electives outside MCS. Permissible electives are listed in the course catalog.

76-101: Interpretation and Argument

Cognition, Choice, and Behavior Elective

Economic, Political, and Social Institutions Elective

Cultural Analysis Elective

Non-Technical Elective

Non-Technical Elective

Non-Technical Elective

Non-Technical Elective

Physics Core

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

Track

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

Physics Breadth Elective

Qualifying Physics Elective

Qualifying Physics Elective

Qualifying Physics Elective

Mathematics Elective

Technical Elective

Technical Elective

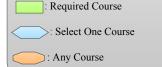
Technical Elective

Free Elective

Free Elective

Free Elective

Note: Free electives are to satisfy the 360 unit requirement.



Key



Physics Major Tracks, Page 1

Graduate School Preparation

Regardless of track, Physics majors planning to undertake graduate studies 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.

Key red Co

Required Course

>: Select One Course

: Recommended Course

: Any Course

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

Free Elective

Free Elective

Free 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

Free Elective

Free Elective

Free 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

Free Elective

Free Elective

Free Elective

Physics Major Tracks, Page 2

Graduate School Preparation

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Electricity & Magnetism II

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

Key

Required Course

>: Select One Course

: Recommended Course

: Any Course

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

Free Elective

Free Elective

Free 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

Free Elective

Free Elective

Free 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

Free Elective

Free Elective

Free Elective