

PORTLAND STATE UNIVERSITY
DEPARTMENT OF PHYSICS

UNDERGRADUATE PROGRAM—STANDARD OPTION

As an undergraduate, you will take a group of core courses that will give you a general background in the subject. You will study force and motion, heat, optics, electricity, magnetism, atomic and nuclear physics, quantum mechanics, and the physical properties of materials, learning both the theoretical and the experimental aspects.

Requirements for Major. It is important that students planning to major in physics contact the Department of Physics prior to the start of their work in order that a coherent program can be planned with their assigned advisor. Students planning to transfer to PSU from community colleges or other universities are strongly advised to contact the Department of Physics well ahead of their proposed date of transfer so that a smooth transition, which avoids course duplication and untimely delays, can be accomplished. Students need to choose between the standard option and environmental physics option. In addition to meeting the general University degree requirements, the student must meet the following minimal departmental course requirements:

Standard Option

Ph 201, 202, 203 General Physics or Ph 211, 212, 213 General Physics with Calculus	12
Ph 214, 215, 216 General Physics Lab	3
Ph 311, 312 Introduction to Modern Physics	8
Ph 314, 315, 316 Experimental Physics I, II, III	16
Ph 322 Computational Physics	4
PH 424 Classical Mechanics	4
PH 426 Thermodynamics and Statistical Mechanics	4
PH 431 Electricity and Magnetism I	4
<u>At least two of the following electives</u>	
PH 411 Introduction to Quantum Mechanics	4
PH 432 Electricity and Magnetism II	4
PH 434 Introduction to Mathematical Physics	4
PH 464 Applied Optics	4
TOTAL in physics (minimum)	63
Mth 251, 252, 253, 254 Calculus	16
Mth 256 Applied Differential Equations I	4
Mth 261 Introduction to Linear Algebra	4
CH 221, 222, 223 General Chemistry	12
CH 227, 228, 229 General Chemistry Lab	3
TOTAL in other	39

Courses taken under the undifferentiated grading option (pass/no pass) are not acceptable toward fulfilling department major requirements except for those major courses offered on a pass/no pass basis only.

Electrical Engineering/Physics Dual Majors

How EE majors can look at the physics program:

Common to both options:

Physics requirements:

Ph 211, 212, 213 General Physics (with Calculus)
Ph 214, 215, 216 Lab for Ph 211, 212, 213
Ph 311, 312 Introduction to Modern Physics
Ph 314, 315 Methods of Experimental Physics
Ph 322 Computational Physics
Ph 424 Classical Mechanics
Ph 431, 432 Electricity and Magnetism
Mth 251, 252, 253, 254 Calculus
Mth 256 Applied Differential Equations
Mth 261 Linear Algebra
One year of general chemistry: Ch 221, 222, 223, 227, 228, 229

EE requirements

Ph211, 212, 213 or 221, 222, 223 General Physics
Ph 214, 215, 216 Lab
EE: Ph319
EE: ECE201, 202, 203, 301, 302
EE: EAS101, 102, ECE311, STAT 451
EE: Ph411 (?)
EE: ECE331, 332
EE: Mth251, 252, 253, 254
EE: Mth256
EE: Mth261
Substitute another year of science or technology (EE electives)

The question marks in the above list indicate a less than ideal fit between the physics and EE programs, but in some approximation these courses are acceptable. The physics courses are highly desirable for both the EE major.

From this analysis, the following can be deduced. Besides completing the BS in EE, EE majors need to take four additional courses in physics to qualify for a BS degree in physics (based on the ECE proposed program for '04/'05).

These include:

Ph 311, 312: Introduction to Modern Physics
Ph 411: Quantum Mechanics
ECE 415 Fundamentals of semiconductor devices or Ph elective (any 3 or more credit class, except for: 321, 314, 315)

Administrative detail: You can simply add physics as your second major in the online registration procedures. The additional work is minimal, if done over two years. This should increase your potential.

These courses are of great importance in high technology and will add considerable value to your electrical engineering degree by providing a solid grounding for the applied work in engineering. The minimum acceptable grade in Ph 311, 312, 411 and the elective is C-.

If for some reason (class time conflicts and/or other reasons) you cannot take Quantum Mechanics (Ph 411), you can substitute any two courses in physics for that course. Thus, in this case, you will have to take a total of five additional courses. Any course of two or more credits will do (300-level and above).

Undergraduate advisor:

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