

Physics Academic Learning Compact

Expected Outcomes for Physics Area of Concentration	Content	Communication	Critical Thinking
1. Students demonstrate the ability to solve problems in the basic areas of undergraduate physics: mechanics, electricity and magnetism, modern physics, quantum mechanics, statistical mechanics, and optics.	X	X	X
2. Students demonstrate the ability to perform laboratory measurements on fundamental concepts of physics in the basic areas of mechanics, optics, electricity and magnetism, modern physics, and electronics.	X	X	X
3. Students demonstrate the ability to communicate clearly their solutions on problems, and their results in the laboratory.		X	
4. Students demonstrate mastery of the research skills necessary for independent study, including the ability to formulate a research problem, conduct preliminary bibliographic research, get results either theoretical or experimental, draw conclusions from their results, and communicate what they have done clearly in an undergraduate thesis.	X	X	X
5. Students engage in outside activities such as summer research internships in universities or national laboratories.	X		X

Measures to track student progress:

Beginning and continuing students in courses are evaluated on the basis of homework assignments, exams, lab reports, and participation in class discussions. Evaluative comments are summarized at the end of each semester in a narrative course evaluation. The physics faculty review all aspects of a student's work in the fifth term before students are allowed to declare physics as their area of concentration, and again when they submit a Thesis Prospectus in their sixth term.

Specific measures to demonstrate each graduate's competencies:

All students with a concentration in physics research and write a senior thesis under the direct supervision of a member of the physics faculty, and defend that thesis in a public oral baccalaureate exam. Theses are judged according to the comprehensiveness of the research, the strength and originality of the interpretation, and the clarity and elegance of the writing style. Performance on the oral exam is judged by how well the student responds to questions, demonstrates knowledge of the field, and

defends his or her own interpretation.

Academic Activities Corresponding to Outcomes	1	2	3	4	5
A broad selection of courses in the discipline covering all of the areas, and emphasizing the field in which the senior thesis will be written.	x	x	x		
Completion of all the required courses in the discipline beginning with Introductory Physics (with lab) two semesters	x	x	x		
Classical Mechanics	x		x		
Electricity and Magnetism	x		x		
Modern Physics (with lab),	x	x	x		
Optics	x	x	x		
Quantum Mechanics	x		x		
Introductory Calculus, Multivariable Calculus, Differential Equations and Linear Algebra	x		x		
At least one course must be taken in each of the divisions outside of the natural sciences.			x		
Off-campus summer research study is highly recommended.					x
A student should apply to the physics faculty in the fifth semester for approval of physics as an Area of Concentration. Acceptance will depend upon a review of the student's evaluations in the discipline, and on a brief statement of his or her purposes for choosing the major.			x	x	
A senior thesis in Physics.			x	x	