

# The Physics Major

The physics major is designed so that students with calculus can finish the introductory sequence in their first year and take intermediate level courses starting their second year, and students without calculus background can finish the introductory sequence by Fall term of their second year and also take intermediate level courses in their second year.

*Prerequisite:* MATH 3, MATH 8, MATH 13, and MATH 23, PHYS 13 and PHYS 14. Students with advanced placement may substitute PHYS 15 and PHYS 16 for PHYS 13 and PHYS 14.

*Major:* A minimum of eight courses in physics, including PHYS 19, PHYS 40, PHYS 41, PHYS 43, PHYS 44, PHYS 50 and two electives. Students taking PHYS 15 may substitute a third elective for PHYS 19. The major requires one upper-level laboratory course, for which PHYS 47, PHYS 48, PHYS 76 or ASTR 61 qualifies, and a culminating experience, for which PHYS 68, PHYS 72, PHYS 73, PHYS 74, PHYS 76, PHYS 77, PHYS 82, PHYS 87, ASTR 74, ASTR 75, or ASTR 81 qualifies. Elective courses are PHYS 30, PHYS 47, PHYS 48, ASTR 15 or ASTR 25, and all physics and astronomy courses numbered in the sixties, seventies and nineties. Courses numbered in the forties may be taken in any order. Students planning graduate study in physics or another science are encouraged to take PHYS 66, PHYS 76, PHYS 91 and other advanced courses. Graduate courses in physics and astronomy are open to qualified undergraduates.

## Suggested Enrollment Patterns for Physics Majors

The suggested enrollment pattern for physics majors varies somewhat according to how much physics and math the student took in high school. However, for all levels of preparation, it is possible to do a solid physics major with many advanced courses, suitable for a wide range of careers including going to graduate school in physics or engineering.

For students placed into MATH 3 and having very little background in math or physics, a typical enrollment pattern would be:

Year	Fall	Winter	Spring	Summer
First	MATH 3	MATH 8	(MATH 13)	
		PHYS 13	PHYS 14	
Second	(MATH 13 or 23)	(MATH 23)	(MATH 23)	
	PHYS 19	(PHYS 41)	(PHYS 40)	PHYS 44
Third	PHYS 50 and higher-level physics courses			

For students placed into MATH 8, with high school calculus and either no high school physics or high school physics without calculus or with relatively little calculus, a typical enrollment pattern would be:

Year	Fall	Winter	Spring	Summer
First	MATH 8	(MATH 13)	(MATH 13 or 23)	
	PHYS 13	PHYS 14	PHYS 19	
Second	(MATH 13 or 23)	(MATH 23)	(MATH 23)	
	(PHYS 43)	(PHYS 41)	(PHYS 40)	PHYS 44
Third	PHYS 50 and higher-level physics courses			



For students placed in MATH 11 or 13 or higher, and who took high school physics with calculus and with sufficient physics to pass the departmental placement exam, a typical enrollment pattern would be:

Year	Fall	Winter	Spring	Summer
First	MATH 11 or 13 PHYS 15	(MATH 23) PHYS 16	(MATH 23) PHYS 31	
Second	(MATH 23) (PHYS 43)	(PHYS 41)	(PHYS 40)	PHYS 44
Third	PHYS 50 and higher-level physics courses			

In the schedules above, parentheses indicate courses that may be taken in a given term or in another term (in the case of MATH 13 or 23), or courses that can be taken dependent on pre-requisites being fulfilled (in the case of PHYS 41 and 40, which require MATH 23). These are just example patterns--there are many other combinations possible. In particular note that PHYS 19 is offered in the Spring and Fall terms. For all levels of preparation, students who follow these or similar patterns start the intermediate physics courses (40-41-43-44) in their sophomore year and have both junior and senior years available for taking higher-level courses. Higher-level courses include PHYS 76 (Advanced Lab), PHYS 72 (Particle Physics), PHYS 75 (Quantum Computation), PHYS 77 (General Relativity), PHYS 68 (Plasma Physics), PHYS 73 (Condensed Matter), and many more. Physics students can also take astronomy courses. Finally, many students following these enrollment patterns choose to take one or more graduate-level courses in their senior year, out of a large number available.

## The Physics Minor

The Physics Minor has the following course requirements:

*Prerequisites:* MATH 3, 8, 13, 23 or equivalents; PHYS 13 and 14 (or 3 and 4, or 15 and 16).

*Minor:* Four courses are required in addition to the prerequisites. One of these must be PHYS 19, except students taking PHYS 15 may substitute a fourth elective for PHYS 19. The other three must be chosen from physics courses numbered 30, 31, or 40 and above, and/or astronomy courses numbered 15 and above, at least one of which must be numbered above all of these.

