

# MATHEMATICS AND PHYSICS

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The major in Mathematics and Physics allows students to explore the productive interaction between the two subjects more extensively than either individual major.

## PREREQUISITES

**Students are held to the prerequisites that were in place when they declared their major.** However, with approval from the DUS, the following requirements, updated for the academic year 2025-2026, may be fulfilled by students who declared the major in a prior term.

Prerequisites to the major include MATH 1200, an introductory physics lecture sequence numbered PHYS 1800, PHYS 1810 or above, and the introductory laboratory course PHYS 2050L.

With prior written permission from the Mathematics DUS, students who completed multivariable calculus during high school may substitute a higher level mathematics course in the same area for MATH 1200. The course being substituted will not count toward the total of fourteen term courses (beyond the introductory level) required for the major.

Students who have taken the introductory physics lecture sequence PHYS 1700, PHYS 1710, or the physics laboratory sequence PHYS 1650L, PHYS 1660L, may also enter the major with permission of the Physics DUS.

## REQUIREMENTS OF THE MAJOR

**Students are held to the requirements that were in place when they declared their major.** However, with approval from the DUS, the following requirements, updated for the academic year 2025-2026, may be fulfilled by students who declared the major in a prior term.

Beyond the prerequisites, the major requires fifteen term courses for 14.5 credits, above the introductory level, including PHYS 2060L and the senior project. At least six of these must be mathematics courses numbered 2220-4690, and at least six must be advanced physics courses (including the senior requirement) chosen in consultation with the adviser for the major. The two remaining courses may be either mathematics or physics courses.

A course must be listed with a math number to count toward the mathematics requirements, including the prerequisites—substitutions from other departments are not allowed. Graduate mathematics courses level 5000-5999 may be counted as electives; graduate mathematics courses level 6000 or above may not be counted.

**SENIOR REQUIREMENT**

A senior project in PHYS 4710 or PHYS 4720 on a topic appropriate for the combined major and acceptable to both the Physics and the Mathematics departments is also required.

**Credit/D/Fail** No course taken Credit/D/Fail may be applied toward the requirements of the major, including the prerequisites.

**Outside credit** Courses taken after matriculation at Yale at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

**ADVISING**

**Graduate classes** Undergraduate students are welcome to enroll in courses level 5000 and above, after completing the relevant pre-requisites. We recommend that students wishing to take graduate classes begin with courses level 5000-5999, which are designed to be accessible to advanced undergraduates, and can be counted toward undergraduate requirements of the major. Courses level 6000 and above cannot be counted toward undergraduate requirements of the major, but they can earn graduation credit, and be applied toward the graduate requirement of the intensive mathematics major as well as toward the graduate requirement of the combined B.S./M.S. degree.

**SUMMARY OF MAJOR REQUIREMENTS**

**Prerequisites** MATH 1200; PHYS 1800, PHYS 1810, or above; PHYS 2050L.

**Number of courses** 14.5 course credits beyond prereqs, incl senior req

**Distribution of courses** 6 mathematics courses numbered 2220-4690; PHYS 2060L and 6 advanced physics courses selected in consultation with major adviser; 2 math or physics electives

**Senior requirement** Senior project in PHYS 4710 or PHYS 4720 on topic acceptable to both depts