

Preprofessional Programs in Engineering

Program Type

Preprofessional Program

The following programs are implemented in consultation with the pre-engineering advisor at Hillsdale College:

TWO/TWO PROGRAM: An engineering curriculum that includes about two years of liberal arts courses, common to the various engineering areas. Two to three years of engineering studies follow, depending on the engineering specialty and the engineering school. The common liberal arts core generally includes humanities, social sciences, English, science and mathematics courses. Thus, one may study liberal arts courses at Hillsdale College for two years before taking junior and senior courses at any college or university with an engineering program. Some schools may require a few hours of additional courses in their first two years, such as computer drawing or programming languages, that Hillsdale does not offer. However, these courses may be taken after transferring to the engineering school. Thus, a standard engineering curriculum may consist of two years of liberal arts courses at Hillsdale College replacing the equivalent at the engineering school. After these courses are transferred to the engineering school, courses may be taken there to complete the engineering degree. The advantage of this is to be able to take the science, math and liberal arts courses at Hillsdale College. In all cases, the student should consult with the Hillsdale College pre-engineering advisor and the school to which the transfer is planned to determine course selections. If a conflict between course requirements occurs, courses required by Hillsdale College will be replaced by those required by the engineering school.

THREE/TWO PROGRAM: Although the above two-year program leads to a standard engineering degree, a student may wish to stay at Hillsdale for three years. The Three/Two Program offers several advantages to students. They may further study liberal arts and sciences at Hillsdale and then receive credit toward a second degree from Hillsdale based on their engineering studies at an engineering school.

Specific Requirements for the Physics-Engineering Option:

The specific requirements for the three/two program with an emphasis in physics will consist of the following:

Freshman and sophomore core: 32 hours

Physics: 201, 202, 303, 304, 310, and 311; three of 410, 421, 451 or 460; one of 470, 471, 472, or 480. Total physics courses: 26 hours

Mathematics: 120 (or 113), 220, 320, 340. Total mathematics courses: 15 hours (or 14 hours)

Chemistry: 201, 202. Total chemistry courses: 8 hours

Hillsdale electives: 12 hours

Total Hillsdale requirements: 93 hours

It is expected that the students in this program will complete two years of physics-related studies at an accredited engineering school before receiving the Hillsdale degree.

Staying at Hillsdale College for a third year allows the student to be much better prepared in the subjects which are the basis for their desired engineering specialty: physics for most engineering areas, chemistry for chemical engineering, and biology for bioengineering. This also allows more time for the study of mathematics, which is needed for all engineering areas. However, the Three/Two Program offers an advantage even beyond the extensive science and mathematics preparation: two undergraduate degrees based on three years of study at Hillsdale, combined with two years of engineering study. This program may be completed with coursework at the engineering school of the student's choice. Thus, one may replace the standard one-degree engineering program at any school with our combined liberal arts and engineering two-degree program. This requires approximately one extra year. This is possible for two reasons: First, the liberal arts courses taken at Hillsdale satisfy requirements at both schools. Second, the courses at the engineering school may be chosen to substitute for the senior year requirements for the Hillsdale College field of concentration. To facilitate arrangements for this program, the student should choose a Hillsdale College field of concentration program early, preferably in the freshman year. During the three years at Hillsdale, the freshman-sophomore year college requirements must be completed. Also, the junior year field of concentration requirements and any special senior year requirements that may not be fulfilled at the engineering school must be taken at Hillsdale. The courses at the engineering school that are to satisfy the remaining senior year Hillsdale College field of concentration requirements should be determined in consultation with the pre-engineering advisor. This is best done while the student is still at Hillsdale College. These courses should be approved by the corresponding department chairman at Hillsdale College, with notification to the division dean, registrar, and

the pre-engineering advisor.

FOUR-YEAR GRADUATE SCHOOL PROGRAM: After successful completion of a four-year degree at Hillsdale College emphasizing science and mathematics, the graduate may apply to the engineering graduate school of choice. The graduate will then be well prepared for the corresponding graduate school studies. This is because the graduate work corresponds to engineering science. It does not depend on all of the undergraduate engineering coursework but mainly on the science and math knowledge taught at Hillsdale. Engineering graduate schools may provide a special course to introduce the science graduate to the science basics of the chosen engineering specialty. Completion of the master's or Ph.D. degree in this way leads to many professional employment opportunities. This is a popular option leading to careers in engineering.

Pre-Engineering Curriculum

FRESHMAN AND SOPHOMORE YEARS: University Physics (Physics 201 and 202), eight hours; Mathematics (120 or 113, 220, 320 and 400), 18 hours; Chemistry 201, four hours; Great Books (English 104 and 105), six hours; humanities, nine hours; social science (including economics) nine hours; rhetoric, three hours.

The above curriculum should be a strong basis for entry into any engineering program but should be adjusted to reflect specific requirements for the chosen area of study at the engineering school of choice. Some engineering fields require additional chemistry courses. Chemical engineering students would also take Chemistry 202. Students wishing to receive a degree from Hillsdale under one of the programs described above should add the college core requirements.