



Pre-Engineering

Total Credits: 40+

Department Chair: Dr. Emil Prodan
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Find the Website [here](#)

Students interested in engineering may pursue the Pre-engineering major or opt for a related major in Physics, Physical Sciences, Biology, Chemistry, Computer Science, or Mathematical Sciences.

The Pre-engineering major is open to students who enter SCW with sufficient AP credits so that they can complete the major, general, and reduced Jewish Studies requirements in 3 years—either one year in Israel and two years at SCW, or three years at SCW.

Pre-engineering majors must continue their studies through a Combined Program in engineering with Columbia University (BS). Students who do not continue at Columbia must complete a total of 6 semesters of Core and change their major (e.g. Physical Sciences or a Shaped Major) in order to receive a BA degree from SCW.

To be eligible to apply for admission to Columbia through the Combined Program in Engineering, Pre-engineering majors must meet the SCW

graduation requirements, other than the 128 credits, as well as all Columbia requirements listed in the Columbia Combined-Plan Guide (available at the Academic Advisement Center). Provided that they maintain a 3.3 GPA overall, with no grade lower than a B in courses required by Columbia, and receive the recommendation of the pre-engineering advisor. For students who enroll in YU beginning with Fall 2019, admission will be competitive with Columbia reserving the right to admit students based upon criteria such as GPA in Columbia required courses, overall GPA, recommendations, etc.

If admitted, students should file for a Leave of Absence and not file for graduation from SCW.

After successfully completing the two-year program at Columbia, students file for BA from YU, and a BS from Columbia.

Students interested in the Columbia Program (BS) should meet with Dr. Lea Santos.

REQUIRED COURSES

Course #	Course Name	Credits
CHEM 1045R	General Chemistry I, Lecture	3
COMP 1300C	Introduction to Computer Science	4
ECON 1010	Principles of Economics (Counts towards Foundations & Contemporary)	3
MATH 1412	Calculus I	4
MATH 1413	Calculus II	4
MATH 1510	Multivariable Calculus	4
PHYS 1051C	General Physics I – Lecture & Lab	4
PHYS 1052C	General Physics II – Lecture & Lab	4

Plus three (3) or more courses as required by the student's engineering track. See page 3 for tracks and courses.

Engineering Major Specific Courses Depending Upon Chosen Field

Applied Math/Applied Physics

- MATH 2601
- PHYS 2051
- PHYS 2052

Biomedical Engineering

- MATH 2105
- MATH 2601
- PHYS 2051
- PHYS 2052
- CHEM 1046R
- CHEM 1047L
- BIOL 1011C
- BIOL 1011C
- Electrical Engineering*

Chemical Engineering

- MATH 2105
- MATH 2601
- CHEM 1046C
- CHEM 1213R
- CHEM 1215L

Civil Engineering

- MATH 2105
- MATH 2601
- Geology course*
- PHYS 1221
- PHYS 1222

Computer Engineering

- MATH 2105
- MATH 2601
- COMP 1504
- COMP 3650
- Electrical Engineering*

Computer Science

- COMP 1320C
- COMP 1504
- COMP 3650

Electrical Engineering

- MATH 2105
- MATH 2601
- PHYS 2051
- PHYS 2052
- Electrical Engineering*

Material Science Engineering

- MATH 2601
- PHYS 2051
- PHYS 2052

Mechanical Engineering

- MATH 2105
- MATH 2601
- PHYS 2051; PHYS 2052 **or**
- BIOL 3038C **or**
- BIOL 3207C; BIOL 3521C
- PHYS 1221
- PHYS 1222
- Electrical Engineering*

* There is no current SCW course that meets this requirement. Introduction to Electrical Engineering (ELEN E 1201) may be taken the summer before entering or while at Columbia.