

# The Combined Plan Program at Columbia University



**The Combined Plan Program is founded on articulation agreements between Columbia University and over 100 affiliate institutions nationwide.**

**Admission to the program is guaranteed if a student successfully meets all of the following requirements:**

- Full-time enrollment at an affiliate institution for at least the past three years
- Minimum overall GPA of 3.30, inclusive of all coursework taken for credit
- Minimum pre-engineering GPA of 3.30, inclusive of all science and mathematics prerequisite coursework. Additionally, a minimum grade of B (3.0) must be obtained on the first attempt in all science and mathematics prerequisite coursework.
- Successful completion of both the foundational and major-specific prerequisite coursework by the end of the spring semester of application
- Successful completion of the degree and major requirements of the affiliate institution by the end of the spring semester of application
- Favorable recommendation letters: one each from the Combined Plan liaison, a science instructor and a math instructor
- Proficiency in English as directed by Columbia on our website

**Applicants who do not meet the above criteria are welcome to apply as part of our competitive review process, where admission is not guaranteed.**

# Prerequisite Coursework

**A student must successfully complete the equivalents of the following Columbia courses at his/her home institution. Liaisons at each school are responsible for determining which classes fulfill these Columbia prerequisite courses and will advise students accordingly.**

## Foundational Courses Required of All Majors

*Note that some majors may require additional specific courses replacing or adding to the following requirements, detailed in the major-specific course lists.*

### Mathematics

Calculus I, II and III (MATH UN1101, MATH UN1102 and MATH UN1201)

### Physics

Introduction to Mechanics and Thermodynamics (PHYS UN1401)

Introduction to Electricity, Magnetism and Optics (PHYS UN1402)

### Chemistry

General Chemistry I Lecture (CHEM UN1403)

### Lab Requirement (choose one of the following two)

Introduction to Experimental Physics Lab (PHYS UN1493/4) *or* General Chemistry Lab (CHEM UN1500)

*Note that some majors require a specific lab in either chemistry or physics, or both.*

## Major-Specific Coursework

**Courses noted with a \* may be taken either before or during enrollment at Columbia.**

### Applied Mathematics or Applied Physics

#### Mathematics

Calculus IV (MATH UN1202)

Ordinary Differential Equations (MATH UN2030)

#### Physics

Introduction to Classical and Quantum Waves (PHYS UN1403)

Introduction to Experimental Physics Lab (PHYS UN1493/4)

#### Additional

*Choose one of the following three:*

General Chemistry I Lecture (CHEM UN1403)

Environmental Biology I: Elements to Organisms (EEEB UN2001) *or*

Introductory Biology I: Biochemistry, Genetics and Molecular Biology (BIOL UN2005)

### Biomedical Engineering

#### Mathematics

Calculus IV (MATH UN1202)

Introduction to Applied Mathematics: Ordinary Differential Equations and Linear Algebra (APMA E2101)

*Or, students must take both an ODE and a Linear Algebra course.*

#### Physics

Introduction to Classical and Quantum Waves (PHYS UN1403)

#### Chemistry

General Chemistry II Lecture (CHEM UN1404)

General Chemistry Lab (CHEM UN1500)

#### Computer Science

Introduction to Computing for Engineers and Applied Scientists in Python (ENGI E1006)

#### Additional

Introductory Biology I: Biochemistry, Genetics and Molecular Biology (BIOL UN2005)

### Computer Science

Introduction to Computer Science and Programming in C/C++, Java, Python or MATLAB (COMS W1004, W1005 or W1007 or ENGI E1006)

*Note that some majors require a specific programming language.*

### Humanities and Social Sciences

Principles of Economics (ECON UN1105)

University Writing (ENGL CC1010)

27 non-technical credit hours (includes courses that fulfill Economics and University Writing)

*Non-technical credit hours should help a student to learn perspectives and principles of the humanities and social sciences through discussion, debate and writing. Examples of these courses can be found on our website (bulletin. [engineering.columbia.edu/b-elective-nontechnical-courses](http://engineering.columbia.edu/b-elective-nontechnical-courses)).*

Introductory Biology II: Cell Biology, Development and Physiology (BIOL UN2006)

\*Introduction to Electrical Engineering (ELEN E1201)

### Chemical Engineering

#### Mathematics

Calculus IV (MATH UN1202)

*Choose one of the following two:*

Ordinary Differential Equations (UN2030) *or*

Introduction to Applied Mathematics: Ordinary Differential Equations and Linear Algebra (APMA E2101)

#### Physics

Introduction to Experimental Physics Lab (PHYS UN1493/4)

#### Chemistry

General Chemistry II Lecture (CHEM UN1404)

General Chemistry Lab (CHEM UN1500)

Organic Chemistry I Lecture (CHEM UN2443)

\*Organic Chemistry I Lab (CHEM UN2943)

#### Computer Science

Introduction to Computing for Engineers and Applied Scientists in Python (ENGI E1006)

### Civil Engineering

#### Mathematics

Introduction to Applied Mathematics: Ordinary Differential Equations and Linear Algebra (APMA E2101)

*Or, students must take both an ODE and a Linear Algebra course.*

#### Computer Science

Introduction to Computer Science and Programming in MATLAB (COMS W1005)

*The department strongly recommends MATLAB over other languages, though it will accept any language.*

# Major-Specific Coursework

Courses noted with a \* may be taken either before or during enrollment at Columbia.

## Civil Engineering (continued)

### Additional

Earth: Origin, Evolution, Processes and Future (EESC UN1011)

\*Mechanics (ENME E3105)

## Computer Engineering

### Mathematics

Calculus IV (MATH UN1202)

Introduction to Applied Mathematics: Ordinary Differential Equations and Linear Algebra (APMA E2101)

*Or, students must take both an ODE and a Linear Algebra course.*

### Computer Science

Discrete Mathematics (COMS W3203)

*Choose one of the following two:*

Introduction to Computer Science and Programming in Java (COMS W1004) *or*

Honors Introduction to Computer Science in Java (COMS W1007)

### Additional

\*Introduction to Electrical Engineering (ELEN E1201)

## Computer Science

### Computer Science

Discrete Mathematics (COMS W3203)

*Choose one of the following two:*

Introduction to Computer Science and Programming in Java (COMS W1004) *or*

Honors Introduction to Computer Science in Java (COMS W1007)

*Choose one of the following two:*

Data Structures in Java (COMS W3134) *or*

Data Structures and Algorithms (COMS W3137)

## Earth and Environmental Engineering

### Mathematics

Introduction to Applied Mathematics: Ordinary Differential Equations and Linear Algebra (APMA E2101)

*Or, students must take both an ODE and a Linear Algebra course.*

\*Introduction to Probability and Statistics (SIEO W3600)

*The course must have calculus, including multivariable integration, as a prerequisite.*

### Chemistry

General Chemistry II Lecture (CHEM UN1404)

General Chemistry Lab (CHEM UN1500)

### Additional

\*A Better Planet by Design (EAEE E2100)

*Choose one of the following two:*

\*Earth's Environmental Systems: The Climate System (EESC UN2100) *or*

\*Earth's Environmental Systems: The Solid Earth System (EESC UN2200)

*Choose one of the following three:*

Organic Chemistry I Lecture (CHEM UN2443)

Introduction to Classical and Quantum Waves (PHYS UN1403) *or*

Introductory Biology I: Biochemistry, Genetics and Molecular Biology (BIOL UN2005)

## Electrical Engineering

### Mathematics

Calculus IV (MATH UN1202)

Introduction to Applied Mathematics: Ordinary Differential Equations and Linear Algebra (APMA E2101)

*Or, students must take both an ODE and a Linear Algebra course.*

### Physics

Introduction to Classical and Quantum Waves (PHYS UN1403)

### Computer Science

*Sufficient knowledge of computer programming is needed in order to take Data Structures in Java (COMS W3134) or Data Structures and Algorithms (COMS W3137) at Columbia.*

### Additional

\*Introduction to Electrical Engineering (ELEN E1201)

## Engineering Mechanics

### Mathematics

Calculus IV (MATH UN1202)

Ordinary Differential Equations (MATH UN2030)

### Additional

\*Mechanics (ENME E3105)

## Industrial Engineering, Engineering Management Systems or Operations Research

### Mathematics

\*Ordinary Differential Equations (MATH UN2030)

*This course must be taken prior to Columbia for any student with interests in the Financial Engineering major. Students cannot apply to this major until they are already enrolled at Columbia (after the first semester in Columbia Engineering).*

*Choose one of the following two:*

Linear Algebra (MATH UN2010) *or*

Applied Mathematics I: Linear Algebra (APMA E3101)

*Choose one of the following two:*

Probability for Engineers (IEOR E3658) *or*

Probability Theory (STAT GU4203)

*Choose one of the following two:*

Applied Statistical Models in Operations Research (IEOR E4307) *or*

Statistical Inference (STAT GU4204)

*Computer Science (choose one language pair)*

Introduction to Computer Science and Programming in Java (COMS W1004) and Data Structures in Java (COMS W3134)

*or*

Introduction to Computing for Engineers and Applied Scientists in Python (ENGI E1006) and Essential Data Structures in C/C++ (COMS W3136)

*The department strongly recommends Java over C/C++ with Python.*

### Economics

\*Introduction to Accounting and Finance (IEOR E2261)

*This course must be taken prior to Columbia for any student with interests in the Financial Engineering major. Students cannot apply to this major until they are already enrolled at Columbia (after the first semester in Columbia Engineering).*

## Materials Science and Engineering

### Mathematics

Calculus IV (MATH UN1202)

Ordinary Differential Equations (MATH UN2030)

### Physics

Introduction to Classical and Quantum Waves (PHYS UN1403)

### Chemistry

*Choose one of the following two:*

General Chemistry I Lecture (CHEM UN1403) *or*

General Chemistry II Lecture (CHEM UN1404)

## Mechanical Engineering

### Mathematics

Calculus IV (MATH UN1202)

Introduction to Applied Mathematics: Ordinary Differential Equations and Linear Algebra (APMA E2101)

*Or, students must take both an ODE and a Linear Algebra course.*

### Additional

\*Introduction to Electrical Engineering (ELEN E1201)

\*Mechanics (ENME E3105)

*Choose one of the following three:*

Introduction to Classical and Quantum Waves (PHYS UN1403)

Environmental Biology I: Elements to Organisms (EEEE UN2001) *or*

Introductory Biology I: Biochemistry, Genetics and Molecular Biology (BIOL UN2005)

*Courses listed are accurate as of September 2016.*



## Important Policies about Prerequisite Coursework

**All prerequisite coursework must appear on the home institution's transcript.** Columbia requires all official transcripts, and **liaisons must approve all coursework not taken at the affiliate institution.** We will accept AP/IB or other advanced credit from high school as well as placement exams if the credit or exam clearly appears on the home institution's transcript and is approved by the liaison. Columbia reserves the right to have the student demonstrate this knowledge and/or retake this course.

The overall GPA will be calculated by Columbia using all postsecondary courses for which a student has received credit on the home institution's transcript. **Columbia requires all official transcripts.** The pre-engineering GPA will be calculated by Columbia using all of the prerequisite coursework listed, with the exception of the courses fulfilling the lab requirement and humanities and social science requirements.

**Due to the sequential nature of the engineering major coursework, prerequisite coursework cannot be taken while at Columbia** and must be completed by the spring semester of application to qualify for guaranteed admission. Courses noted with \* are excluded from this requirement, as they may be taken once at Columbia. Students may present course syllabi to request placement out of these courses once at Columbia.

Major requirements comprise the sequence of courses required to complete a major or primary course of study from the home institution. Degree requirements are courses, as listed in the home institution's course catalog, that are required to obtain a degree from the home institution. A student does not need to complete the full number of course credits required for the degree (e.g., the full 128 credits), as the home institution will accept course credits from Columbia to complete this degree. Subsequently, 3-2 candidates cannot receive their degree from the home institution until the two years at Columbia are successfully completed.



## Financial Aid Policies

Financial aid is available for Combined Plan students. Applicants should note:

- Columbia awards no merit scholarships; all financial aid is need-based only.
- Admission to the Combined Plan program is need-blind; financial need does not affect one's chances of admission.
- We do not guarantee that we can meet 100% of demonstrated financial need for all Combined Plan students.
- Very limited financial aid is available for international students.
- Candidates are not guaranteed the same financial aid package that they may have received at their home institutions.

## Housing at Columbia

**Housing is guaranteed for Combined Plan students in their first year only;** there is no guarantee that on-campus housing will be available in their second year. Off-Campus Housing Assistance at Columbia can assist students in their search for housing in the New York metropolitan area.



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