The Combined Plan Program at **Columbia University**

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

To be considered in our competitive review process, we recommend that an applicant successfully meets all of the following ±¿⁹®¯₽¸¯½

- Full-time enrollment at an affiliate institution for at least the past three years

- An overall GPA in accordance with the agreement that your institution has reached with Columbia. We recommend that students have a minumum overall GPA of 3.30.

- 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

- Columbia will not expect Combined Plan applicants to have earned letter grades in their classes taken in Spring 2020 if their home school either moved all classes to Pass/Fail, or some variant in which students were allowed to take some classes for a letter grade and others for Pass/Fail marks. This only applies if your school is moved to online instruction for the remainder of the Spring 2020 semester.

- For Fall 2020 and Spring 2021 terms, Columbia will accept prerequisite courses completed at a student's home institution in the format offered, whether online, in-person, or a hybrid model. These courses must be completed for a letter grade.

- Columbia will not accept prerequisite classes taken online before Spring 2020 or after Spring 2021. These classes must also be taken for a letter grade.

Prerequisite Coursework

A student should successfully complete the equivalents of the following Columbia courses at their 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 Multivariable Calculus for Engineers and Applied Scientists (Math UN1101, MATH UN1102, and APMA E2000)

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.

Computer Science
Introduction to Computer Science and Programming in C/C++, Java (COMS W1004), Python (ENGI E1006) or MATLAB (COMS W1005)
Note that some majors require a specific programming language.

Humanities and Social Sciences
27 non-technical credit hours including Principles of Economics (ECON UN1105) and University Writing (ENGL CC1010)

Non-technical credit hours should help a student to learn perspectives and principles of the humanities and social sciences through discussion, debate and writing. Please note that non-technical electives are subject to the review of Undergraduate Admissions. Examples of these courses can be found on our website (https://bulletin.engineering. Columbia.edu/b-elective-nontechnical-courses).

Major-Specific Coursework

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

Applied Mathematics
Mathematics
Ordinary Differential Equations (MATH UN2030)
Physics
Introduction to Classical and Quantum Waves (PHYS UN1403)
Additional
Introduction to Experimental Physics Lab (PHYS UN1493/4)
Students may take a lab other than Physics lab: Astronomy, Astrophysics, Biology or Chemistry.
Choose one of the following three:
General Chemistry I Lecture (CHEM UN1403) *or*
Environmental Biology I: Elements to Organisms (EEEB UN2001) *or*
Introductory Biology I: Biochemistry, Genetics and Molecular Biology (BIOL UN2005)
Computer Science
Introduction to Computing for Engineers and Applied Scientists in Python (ENGI E1006)
The department strongly recommends Python, but will accept C/C++, Java or MATLAB on a case by case basis.

Applied Physics
Mathematics
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) *or* Environmental Biology I: Elements to Organisms (EEEB UN2001) *or* Introductory Biology I: Biochemistry, Genetics and Molecular Biology (BIOL UN2005)

Computer Science
Introduction to Computing for Engineers and Applied Scientists in Python (ENGI E1006)
The department strongly recommends Python, but will accept C/C++, Java or MATLAB on a case by case basis.

Biomedical 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.
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)
Introductory Biology II: Cell Biology, Development and Physiology (BIOL UN2006)
*Introduction to Electrical Engineering (ELEN E1201)

Chemical Engineering
Mathematics
Choose one of the following two:
Ordinary Differential Equations (MATH UN2030) *or*
Introduction to Applied Mathematics: Ordinary Differential Equations and Linear Algebra (APMA E2101)

Major-Specific Coursework

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

Chemical Engineering Cont.
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 UN2495)
*Organic Chemistry II Lab (CHEM UN2496)
Computer Science
Introduction to Computing for Engineers and Applied Scientists in Python (ENGI E1006)
The department strongly recommends Python, but will accept C/C++, Java or MATLAB on a case by case basis.

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 Computing for Engineers and Applied Scientists in Python (ENGI E1006)
The department strongly recommends Python over other languages, though it will accept any language.
Additional
Earth: Origin, Evolution, Processes and Future (EESC UN1011) or an equivalent introductory course in Geology/Geosciences
*Mechanics (ENME E3105)

Computer 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
Discrete Mathematics (COMS W3203)
Introduction to Computer Science and Programming in Java (COMS W1004)
Please note that sufficient knowledge of computer programming is needed in order to take Data Structures in Java (COMS W3134).
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)
The department strongly recommends Java, though it will accept other languages as long as a Data Structures course in that language has also been completed.

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 & Statistics (STAT GU4001)
The course must have calculus, including multivariable integration, as a prerequisite.
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)
The department requires Python for the introductory Computer Science requirement. Only students attending affiliates that do not offer Python may substitute another language.
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
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 with C/C++ (COMS W3136) or Data Structures in Java (COMS W3134).
Additional
Introduction to Electrical Engineering (ELEN E1201)

Engineering Mechanics
Mathematics
Ordinary Differential Equations (MATH UN2030)
Or, students must take both an ODE and a Linear Algebra course.
Computer Science
Introduction to Computing for Engineers and Applied Scientists in Python (ENGI E1006)
The department strongly recommends Python over other languages, though it will accept any language.
Additional
*Mechanics (ENME E3105)

Industrial Engineering, Engineering Management Systems or Operations Research
Mathematics
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)

Major-Specific Coursework

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

Industrial Engineering, Engineering Management Systems or Operations Research Cont.

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.*

Materials Science and 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.

Physics
Introduction to Classical and Quantum Waves (PHYS UN1403)

Chemistry
Choose one of the following three:
General Chemistry I Lecture (CHEM UN1403) *or*
General Chemistry II Lecture (CHEM UN1404) *or*
Intensive Organic Chemistry I (CHEM UN2045)

Computer Science
Introduction to Computing for Engineers and Applied Scientists in Python (ENGI E1006)
The program strongly recommends Python.

Additional
Choose one of the following three:
Introduction to Experimental Physics Lab (PHYS UN1493/4) *or*
General Chemistry Lab (CHEM UN1500) *or*
Physical and Analytical Chemistry Lab (CHEM UN3085)

Mechanical Engineering

Mathematics
Linear Algebra (APMA E3101 *or* MATH UN2010)
and Ordinary Differential Equations (MATH UN2030 *or* Math UN3027)
or
Introduction to Applied Mathematics: Ordinary Differential Equations and Linear Algebra (APMA E2101)
The department strongly recommends taking ODE and Linear Algebra separately.

Computer Science
Foundations of Data Science (ORCA E2500)
Students must take a substantial equivalent to ORCA E2500 before coming to Columbia. Only students attending affiliates that do not offer an equivalent may take the course at Columbia.
Choose one of the following three:
Introduction to Computer Science and Programming in Java (COMS 1004) *or* MATLAB (COMS W1005)
or Python (ENGI E1006).

Additional
*Introduction to Electrical Engineering (ELEN E1201)
*Mechanics (ENME E3105)
Choose one of the following three:
Introduction to Classical and Quantum Waves (PHYS UN1403) *or*
Environmental Biology I: Elements to Organisms (EEEB UN2001) *or*
Introductory Biology I: Biochemistry, Genetics and Molecular Biology (BIOL UN2005)

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. 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.

Please note, the applicant must declare an engineering major at the time of application to Columbia. No change of major is allowed after an admission decision has been rendered.

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. 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.

Brandeis University Course Equivalents for the Columbia 3-2 Combined Plan Program
Please use this with the planning worksheet in order to best plan your course choices

Columbia Course	Brandeis Equivalent
FOUNDATION COURSES REQUIRED OF ALL MAJORS	
Calculus I – V1101	Math10a
Calculus II – V1102	Math10b
Multivariable Calculus for Engineers and Applied Scientists – APMA E2000	MATH 20a
Mechanics and Thermodynamics – C1401	Phys11a or Phys15a
Electricity, Magnetism, and Optics – C1402	Phys11b or Phys15b
General Chemistry I – C1403	Chem11a or Chem15a
Introduction to Computer Science and Programming in C++, JAVA, Python, or MATLAB – COMS W1004, W1005, W1007, or W1009 or ENGI E1006	Cosi 10a, Cosi 12b, or Cosi177a
Principles of Economics – ECON W1105	Econ2a or Econ10a *(Counts as one of the 7 non-technical electives)*
English Composition – ENGL C1010 University Writing	Any UWS *(Counts as one of the 7 non-technical electives)*
MAJOR-SPECIFIC COURSEWORK	
Mathematics Courses	
Calculus IV – V1202	Math20a (Math 35a recommended)
Ordinary Differential Equations – E2030	Math37a
Linear Algebra – MATH V2010 or APAM E3101	Math15a
Introduction to Applied Mathematics: Ordinary Differential Equations and Linear Algebra – APMA E2101	Math15a AND Math37a
Probability for Engineers (IEOR E3658)	Math36a
Probability Theory (STAT GU4203)	Math 36a
Applied Statistical Models – IEOR E4307	Math 36b
Statistical Inference (STAT GU4204)	Math 36b
Biology, Chemistry, and Physics Courses	
Physics Lab – C1493/4	Phys19a or Phys19b
General Chemistry Lab – C1500	Chem 18/19a or Chem 18/19b
General Chemistry II – C1404	Chem11b or Chem15b
Organic Chemistry I – C3443	Chem25a
Organic Chemistry Lab – C3543	Chem29a
Classical and Quantum Waves – C1403	Phys20a
Environmental Biology: Molecules to Cells – EEEB W2001	No Equivalent
Introductory Biology I: Biochemistry, Genetics and Molecular Biology – BIOL UN2005	Bio 14a
Introductory Biology II: Cell Biology, Development and Physiology – BIOL UN2006	Bio 15b
Advanced General Geology – EESC W4001, The Climate System – EESC V2100 The Solid Earth System – EESC V2200, Better Planet by Design – EAEE E2100	No Equivalents May be taken while at Columbia
Computer Science and Engineering Courses	
Introduction to Electrical Engineering – ELEN 1201	No Equivalent
Computer Science: Python Programming Language	No Equivalent
Introduction to Computing for Engineers and Applied Scientists - ENGI E1006	Cosi 2a
Mechanics – ENME E3105	No Equivalent May be taken while at Columbia
Computer Science: MATLAB Programming Language	Cosi177a
Discrete Mathematics – COMS W3203	Cosi29a
Data Structures and Algorithms – COMS W3134 or W3137	Cosi21a
Introduction to Computer Programming in Java – COMS W1004	Cosi11a
Data Structures in C/C++ - COMS W3136	No Equivalent
Data Structures in JAVA – COMS W3134	Cosi21a
Economics Courses	
Introduction to Accounting and Finance – E2261	Bus6a

Brandeis University – Non-Technical Electives
Please use this with the Columbia guide in order to best plan your course choices

The Columbia 3-2 Plan requires you to take 7 non-technical electives at Brandeis. ECON 2A or 10A and your UWS count as 2 of these, so that leaves you with 5 additional non-technical electives that you need to take.

Below are some explanations of what will count towards this requirement.

African- American Studies: All courses

American Studies: All courses

Anthropology: All courses in sociocultural anthropology

All courses in archaeology except field work
No courses in biological/physical anthropology

Art History: All courses

Classics: All courses

Comparative Literature: All courses

Creative Writing: All courses

Dance: All courses except performance classes

East Asian Languages and Culture: All courses

Economics: Check first with Academic Services

Education: All courses

English: All courses

Film, TV, and Interactive Media: All courses except any lab/workshop or independent study courses

French and Francophone Studies: All courses

German Studies: All courses

Hispanic Studies: All courses

History: All courses

Italian Studies: All courses

Language and Linguistics: All courses except cognitive linguistics courses

Latin American and Latino Studies: All courses

Medieval and Renaissance Studies: All courses

Music: All courses except performance, instruction, or workshop courses

Philosophy: Check first with Academic Services

Politics: Check first with Academic Services

Psychology: Check first with Academic Services

Religious Studies: All courses

Sociology: Check first with Academic Services

Studio Art: Only one upper-level course can be accepted

Theater: All courses except workshop, rehearsal, performance, or technical courses (THA 15b – Public Speaking does count! THA 138a does not count.)

Women's and Gender Studies: All courses

For more information see Columbia's listing: http://bulletin.engineering.columbia.edu/b-elective-nontechnical-courses

Brandeis Columbia 3-2 Planning Worksheet
For students matriculating Summer 2019 and later
Begin by filling out your plan to complete the Brandeis Core and major requirements, and the Columbia foundational and major-specific requirements (left column). Then make sure each class has a place in your academic plan (right column).

Brandeis University Core:

_____	UWS
_____	Quantitative Reasoning
_____	Creative Arts
_____	Humanities
_____	Science
_____	Social Science
_____	World Languages and Cultures
_____	Diversity, Equity, & Inclusion Studies
_____	Difference and Justice in the World
_____	Health, Wellness, & Life Skills (3)

Brandeis Major: _____

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	
_____	WI: _____
_____	DL: _____
_____	OC: _____

Columbia Foundation Requirements:
Grade of B or higher recommended

_____	Math 10a
_____	Math 10b
_____	Math 20a
_____	Physics 11a or 15a
_____	Physics 11b or 15b
_____	Chemistry 11a or 15a
_____	One semester Chem or Physics Lab (no AP)
_____	Cosi 10a, 12b, or 177a
_____	Econ 2a or 10a

Non-Technical Electives
Five Humanities or Social Science courses:
Can overlap with University Requirements, can be taken Pass/Fail in compliance with Brandeis policy. See Columbia chart of eligible courses.

_____ _____
_____ _____
_____ _____
_____ _____
_____

Eligible AP/IB credits (if applicable)

Exam name	Score

Semester 1

Course	Grade

Semester 2

Course	Grade

Summer 1 (optional)

Course	Grade

Semester 3

Course	Grade

Semester 4

Course	Grade

Summer 2 (optional)

Course	Grade

Brandeis Columbia 3-2 Planning Worksheet

For students matriculating Summer 2019 and later

Begin by filling out your plan to complete the Brandeis Core and major requirements, and the Columbia foundational and major-specific requirements (left column). Then make sure each class has a place in your academic plan (right column).

Columbia Major Prerequisites: _____

Grade of B or higher recommended

_____   _____
_____   _____
_____   _____
_____   _____
_____   _____
_____   _____
_____   _____
_____   _____
_____   _____
_____   _____
_____   _____
_____   _____

Cumulative GPA _____ *(3.3+ recommended)*

Semester 5

Course	Grade

Semester 6

Course	Grade