2026-2027 PRE-COMBINED PLAN CURRICULUM MAPPING GUIDE

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Overview: This document has been written to correlate the Columbia University Combined Plan requirements for each Engineering Major with available YU course offerings. The first section contains foundation requirements for all Majors; followed by major-specific course requirements.

In order to be considered for admission, students must successfully complete the YU courses below, which convey the material covered by Columbia courses. In a small number of cases, YU does not offer a course covering the Columbia material; please consult Dr. Ed Berliner (contact above) to discuss fulfillment of those requirements or with any other questions.

Most students major in Physics, Physical Sciences, or a related field at YU. Columbia strongly recommends an overall GPA of 3.5 and no grade lower than B (on the first time a course is taken) in all the required courses presented below. If courses are taken at other Institutions and transferred to YU, they must be listed on the transcript with a YU course number (indicating the YU Department has approved the course) and must be taken in person at the offering Institution. In addition, all YU requirements for graduation (valid major and all Gen Ed courses) must be met with the exception of the total number of credits.

FOUNDATION COURSES REQUIRED OF ALL MAJORS		
Columbia	**Stern College**	**Yeshiva College**
MATHEMATICS		
Calculus I, Calculus II	MATH 1412 (Calculus I) 4 MATH 1413 (Calculus II) 4	MAT 1412 (Calculus I) 4 MAT 1413 (Calculus II) 4
Multivariable Calculus	MATH 1510 (Multivariable Calculus) 4	MAT 1510 (Multivariable Calculus) 4
PHYSICS		
Mechanics and Thermodynamics Electricity, Magnetism, and Optics	PHYS 1051 (General Physics I Lecture) 3 • Coreq to PHYS 1053 (General Physics I Lab) 1 PHYS 1052 (General Physics II Lecture) 3 • Coreq to PHYS 1054 (General Physics II Lab) 1	PHY 1051 (General Physics I Lecture) 3 • Coreq to PHY 1053 (General Physics I Lab) 1 PHY 1052 (General Physics II Lecture) 3 • Coreq to PHY 1054 (General Physics II Lab) 1
CHEMISTRY		
General Chemistry I Many programs require General Chemistry II	CHEM 1045 (General Chemistry I Lecture) 3	CHE 1045 (General Chemistry I Lecture) 3
LAB REQUIREMENT		
One semester of physics lab (listed above) or one semester chemistry lab	CHEM 1047 (General Chemistry II Lab) 2 • Coreq to CHEM 1046 (General Chemistry II Lecture) 3	CHE 1047 (General Chemistry II Lab) 2 • Coreq to CHE 1046 (General Chemistry II Lecture) 3
COMPUTER SCIENCE		
Intro to Computer Science	COMP 1300 (Intro to Computer Science) 4	COM 1300 (Intro to Computer Science) 4
HUMANITIES AND SOCIAL SCIENCES		
27 non-technical credit hours, which must include Principles of Economics and	ECON 1010 (Principles of Economics) 3 Either:	ECO 1010 (Principles of Economics) FYWR 1020 (First-Year Writing) 3

English Composition	ENGL 1100 (Comp and Rhetoric) 3 OR ENGL 1200 (Freshman Honors Seminar) 3	

APPLIED MATHEMATICS OR APPLIED PHYSICS		
Columbia	**Stern College**	**Yeshiva College**
MATHEMATICS		
Calculus IV	No additional courses needed	No additional courses needed
Ordinary Differential Equations	MATH 2601 (Ordinary Differential Equations) 3	MAT 2601 (Ordinary Differential Equations) 3
PHYSICS		
Classical and Quantum Waves	PHYS 2051 (Gen Physics III) 3 PHYS 2052 (Gen Physics IV) 3	PHY 2051 (Gen Physics III) 3 PHY 2052 (Gen Physics IV) 3
Physics Lab	PHYS 1033 (Intro Physics I Lab) 1 • Coreq to PHYS 1031 (Intro to Physics I Lecture) 3	PHY 1033 (Intro Physics I Lab) • Coreq to PHY 1031 (Intro to Physics I Lecture) 3
CHEMISTRY AND BIOLOGY (Choose one course; labs not required)		
General Chemistry	CHEM 1045 (General Chemistry) 3	CHE 1045 (General Chemistry) 3
Environmental Biology	Not offered	Not offered
Introduction to Molecular and Cellular Biology	BIOL 3207 (Cell Biology) 4 AND BIOL 3521 (Molecular Biology) 4	BIO 3207 (Cell Biology) 4 AND BIO 3521 (Molecular Biology) 4

BIOMEDICAL ENGINEERING		
Columbia	**Stern College**	**Yeshiva College**
MATHEMATICS		
Calculus IV	No additional courses needed	No additional courses needed
Ordinary Differential Equations	MATH 2601 (Ordinary Differential Equations) 3 AND MATH 2105 (Linear Algebra) 3	MAT 2601 (Ordinary Differential Equations) 3 AND MAT 2105 (Linear Algebra) 3
Linear Algebra		
PHYSICS		
Classical and Quantum Waves	PHYS 2051 (Physics III) 4 AND PHYS 2052 (Physics IV) 4	PHY 2051 (Physics III) 4 AND PHY 2052 (Physics IV) 4
CHEMISTRY		
General Chemistry II	CHEM 1046 (General Chemistry II Lec) 3	CHE (General Chemistry II Lec) 3
General Chemistry Lab	CHEM 1047 (Gen Chem II Lab) 2	CHE 1047 (Gen Chem II Lab) 2
BIOLOGY		
Biology I and II	BIOL 1011 (Principles of Biology I) 3 • Coreq to BIOL 1031 (Principles of Biology I Lab) 1 AND BIOL 1012 (Principles of Biology II) 3 • Coreq to BIOL 1014 (Principles of Biology II Lab) 1	BIO 1011 (Principles of Biology I) 3 • Coreq to BIOL 1031 (Principles of Biology I Lab) 1 AND BIO 1012 (Principles of Biology II) 3 • Coreq to BIO 1014 (Principles of Biology II Lab) 1
ELECTRICAL ENGINEERING		
Introduction to Electrical Engineering	May be taken during the summer before entry to Columbia This may also be satisfied by MATH 1011 (Digital Design and Communications) 4	May be taken during the summer before entry to Columbia This may also be satisfied by MAT 1011 (Digital Design and Communications) 4
COMPUTER SCIENCE		

Python Language	No additional courses required	No additional courses required

CHEMICAL ENGINEERING		
Columbia	**Stern College**	**Yeshiva College**
MATHEMATICS		
Calculus IV	No additional courses required	No additional courses required
Ordinary Differential Equations	MATH 2601 (Ordinary Differential Equations) 3 AND MATH 2105 (Linear Algebra) 3	MAT 2601 (Ordinary Differential Equations) 3 AND MAT 2105 (Linear Algebra) 3
PHYSICS		
Physics Lab	PHYS 1051 (General Physics I Lecture) 3 • Coreq to PHYS 1053 (General Physics I Lab) 1 PHYS 1052 (General Physics II Lecture) 3 • Coreq to PHYS 1054 (General Physics II Lab) 1	PHY 1051 (General Physics I Lecture) 3 • Coreq to PHY 1053 (General Physics I Lab) 1 PHY 1052 (General Physics II Lecture) 3 • Coreq to PHY 1054 (General Physics II Lab) 1
CHEMISTRY		
General Chemistry II	CHEM 1046 (General Chemistry II Lec) 3	CHE 1046 (General Chemistry II Lec) 3
General Chemistry Lab	CHEM 1047 (General Chemistry II Lab) 2	CHE 1047 (General Chemistry II Lab) 2
Organic Chemistry I	CHEM 1213 (Organic Chemistry I Lec) 3	CHE 1213 (Organic Chemistry I Lec) 3
Organic Chemistry Lab (May be taken during enrollment at Columbia	CHEM 1215 (Organic Chemistry I Lab) 2	CHE 1215 (Organic Chemistry I Lab) 2
COMPUTER SCIENCE		
Python Language	No additional courses needed	No additional courses needed

CIVIL ENGINEERING		
Columbia	**Stern College**	**Yeshiva College**
MATHEMATICS		
Ordinary Differential Equations	MATH 2601 (Ordinary Differential Equations) 3	MAT 2601 (Ordinary Differential Equations) 3
Linear Algebra	MATH 2105 (Linear Algebra) 3	MAT 2105 (Linear Algebra) 3
GEOLOGY		
Earth: Origin, Evolution, Processes, Future	Offered occasionally as either PHYS 4930 (Topics in Physics) OR PHYS 4934 (Topics in Science) (But not guaranteed. May be taken at another institution.)	Offered occasionally as either PHY 4930 (Topics in Physics) OR PHY 4934 (Topics in Science) (But not guaranteed. May be taken at another institution.)
ENGINEERING MECHANICS		
Mechanics	PHYS 4221 (Classical Mechanics) 3 Supplemental Material may be required to be taken at Columbia	PHYS 4221 (Classical Mechanics) 3 Supplemental Material may be required to be taken at Columbia
COMPUTER SCIENCE		
Introduction to Computer Science and Programming in MATLAB	No additional courses required, but Columbia may require a MATLAB course upon matriculation	No additional courses required, but Columbia may require a MATLAB course upon matriculation

COMPUTER ENGINEERING		
Columbia	**Stern College**	**Yeshiva College**
MATHEMATICS		
Calculus IV	No additional courses required	No additional courses required
Ordinary Differential Equations	MATH 2601 (Ordinary Differential Equations) 3	MAT 2601 (Ordinary Differential Equations) 3
Linear Algebra	MATH 2105 (Linear Algebra) 3	MAT 2105 (Linear Algebra) 3
COMPUTER SCIENCE		
Discrete Mathematics	COMP 1504 (Discrete Structures) 3	COM 1310 (Math for Computer Science) 4
ELECTRICAL ENGINEERING		
Introduction to Electrical Engineering	May be taken during the summer before entry to Columbia This may also be satisfied by MATH 1011 (Digital Design and Communications) 4	May be taken during the summer before entry to Columbia This may also be satisfied by MAT 1011 (Digital Design and Communications) 4

COMPUTER SCIENCE		
Columbia	**Stern College**	**Yeshiva College**
COMPUTER SCIENCE		
Java Skills	No additional courses needed	No additional courses needed
Data Structures and Algorithms	COMP 1320 (Data Structures) 4	COM 1320 (Data Structures) 4
MATHEMATICS		
Discrete Mathematics	MATH 2601 (Ordinary Differential Equations) 3 AND Math 2105 (Linear Algebra) 3	MAT 2601 (Ordinary Differential Equations) 3 AND MAT 2105 (Linear Algebra) 3

EARTH AND ENVIRONMENTAL ENGINEERING		
Columbia	**Stern College**	**Yeshiva College**
MATHEMATICS		
Ordinary Differential Equations	MATH 2601 (Ordinary Differential Equations) 3	MAT 2601 (Ordinary Differential Equations) 3
Linear Algebra	MATH 2105 (Linear Algebra) 3	MAT 2105 (Linear Algebra) 3
Introduction to Probability and Statistics	MATH 2461 (Probability Theory) 3 AND MATH 2462 (Mathematical Statistics) 3	MAT 2461 (Probability Theory) 3 AND MAT 2462 (Mathematical Statistics) 3
CHEMISTRY		
General Chemistry II	CHEM 1046 (General Chemistry II Lec) 3	CHE 1046 (General Chemistry II Lec) 3
COMPUTER SCIENCE		
Introduction to Computer Science	No additional courses needed	No additional courses needed
OTHER SCIENCE (CHOOSE ONE)		
Organic Chemistry	CHEM 1213 (Organic Chemistry I) 3 • Coreq to CHEM 1215 Organic Chemistry I Lab) 2	CHE 1213 (Organic Chemistry I) 3 • Coreq to CHE 1215 Organic Chemistry I Lab) 2
Classical and Quantum Waves	PHYS 2051 (Physics III) 4 AND PHYS 2052 (Physics IV) 4	PHY 2051 (Physics III) 4 AND PHY 2052 (Physics IV) 4
Introduction to Molecular and Cell Biology	BIOL 3207 (Cell Biology) 4 BIOL 3521 (Molecular Biology) 4	BIO 3207 (Cell Biology) 4 BIO 3521 (Molecular Biology) 4
EARTH AND ENVIRONMENTAL SCIENCES		
EITHER The Climate System OR The Solid Earth System	Not currently offered; may be taken while at Columbia	Not currently offered; may be taken while at Columbia
Better Plan By Design	Not currently offered; may be taken while at Columbia	Not currently offered; may be taken while at Columbia

ELECTRICAL ENGINEERING		
Columbia	**Stern College**	**Yeshiva College**
MATHEMATICS		
Calculus IV	No additional courses required	No additional courses required
Ordinary Differential Equations	MATH 2601 (Ordinary Differential Equations) 3	MAT 2601 (Ordinary Differential Equations) 3
Linear Algebra	MATH 2105 (Linear Algebra) 3	MAT 2105 (Linear Algebra) 3
PHSYICS		
Classical and Quantum Waves	PHYS 2051 (Gen Physics III) 4 AND PHYS 2052 (Gen Physics IV) 4	PHY 2051 (Gen Physics III) 4 AND PHY 2052 (Gen Physics IV) 4
COMPUTER SCIENCE		
Sufficient knowledge to take Data Structures in Java or Data Structures and Algorithms while at Columbia	No additional courses required	No additional courses required
ELECTRICAL ENGINEERING		
Introduction to Electrical Engineering	May be taken during the summer before entry to Columbia This may also be satisfied by MATH 1011 (Digital Design and Communications) 4	May be taken during the summer before entry to Columbia This may also be satisfied by MAT 1011 (Digital Design and Communications) 4

ENGINEERING MECHANICS		
Columbia	**Stern College**	**Yeshiva College**
MATHEMATICS		
Calculus IV	No additional courses required	No additional courses required
Ordinary Differential Equations	MATH 2601 (Ordinary Differential Equations) 3	MAT 2601 (Ordinary Differential Equations) 3
Linear Algebra	MATH 2105 (Linear Algebra) 3	MAT 2105 (Linear Algebra) 3
PHYSICS		
Mechanics	PHYS 4221 (Classical Mechanics) 3 Supplemental Material may be required to be taken at Columbia	PHY 4221 (Classical Mechanics) 3 Supplemental Material may be required to be taken at Columbia

INDUSTRIAL ENGINEERING, ENGINEERING MANAGEMENT SYSTEMS, OR OPERATIONS RESEARCH Notes: Students interested in Financial Engineering must take Differential Equations before coming to Columbia. Students cannot apply to this major until after one semester at Columbia.		
Columbia	**Stern College**	**Yeshiva College**
MATHEMATICS		
Linear Algebra	MATH 2105 (Linear Algebra) 3	MAT 2105 (Linear Algebra) 3
Probability and Statistics	MATH 2461 (Probability Theory) 3 AND MATH 2462 (Mathematical Statistics) 3	MAT 2461 (Probability Theory) 3 AND MAT 2462 (Mathematical Statistics) 3
COMPUTER SCIENCE		
Introduction to Computing Engineers and Applied Statistics OR Introduction to Computer Programming in Java	Two Courses • COMP 1300 (Introduction to Computer Science and Programming) 4 • COMP 1320 (Introduction to Data Structures) 4	Two Courses • COM 1300 (Introduction to Computer Science and Programming) 4 • COM 1320 (Introduction to Data Structures) 4

MATERIALS SCIENCE AND ENGINEERING		
Columbia	**Stern College**	**Yeshiva College**
MATHEMATICS		
Calculus IV	No additional courses required	No additional courses required
Ordinary Differential Equations	MATH 2601 (Ordinary Differential Equations) 3	MAT 2601 (Ordinary Differential Equations) 3
Linear Algebra	MATH 2105 (Linear Algebra) 3	MAT 2105 (Linear Algebra) 3
PHYSICS		
Classical and Quantum Waves	PHYS 2051 (Gen Physics III) 4 AND PHYS 2052 (Gen Physics IV) 4	PHY 2051 (Gen Physics III) 4 AND PHY 2052 (Gen Physics IV) 4

MECHANICAL ENGINEERING		
Columbia	**Stern College**	**Yeshiva College**
MATHEMATICS		
Calculus IV	No additional courses required	No additional courses required
Ordinary Differential Equations	MATH 2601 (Ordinary Differential Equations) 3	MAT 2601 (Ordinary Differential Equations) 3
Linear Algebra	MATH 2105 (Linear Algebra) 3	MAT 2105 (Linear Algebra) 3
PHYSICS/BIOLOGY (Choose one)		
Classical and Quantum Waves	PHYS 2051 (Gen Physics III) 4 AND PHYS 2052 (Gen Physics IV) 4	PHY 2051 (Gen Physics III) 4 AND PHY 2052 (Gen Physics IV) 4
Environmental Biology: Elements to Organisms	Not currently offered	Not currently offered
Biochemistry, Genetics, and Molecular Biology	Not currently offered	Not currently offered
Biology 1 and 2	BIOL 1011 (Principles of Biology I) 3 • Coreq to BIOL 1013 Principles of Biology I Lab) 1 AND BIOL 1012 (Principles of Biology II) 3 • Coreq to BIOL 1014 Principles of Biology II Lab) 1	BIO 1011 (Principles of Biology I) 3 • Coreq to BIO 1013 Principles of Biology I Lab) 1 AND BIO 1012 (Principles of Biology II) 3 • Coreq to BIO 1014 Principles of Biology II Lab) 1
ENGINEERING MECHANICS		
Mechanics	PHYS 4221 (Classical Mechanics) 3 Supplemental Material may be required to be taken at Columbia	PHY 4221 (Classical Mechanics) 3 Supplemental Material may be required to be taken at Columbia
ELECTRICAL ENGINEERING		

Introduction to Electrical Engineering	May be taken during the summer before entry to Columbia This may also be satisfied by MATH 1011 (Digital Design and Communications) 4	May be taken during the summer before entry to Columbia This may also be satisfied by MAT 1011 (Digital Design and Communications) 4