American University Course Equivalents for Many of the Courses Taken by Students in the Dual-degree Engineering Combined Plan Program

Note: This document was prepared using the numbering scheme in Columbia's 2018-2019 curriculum guide. It is a living document and subject to change and correction. Table I provides a list of the foundation courses required of all students pursuing this program. Table II provides a list of courses that might be required as part of the major-specific requirements. The actual courses needed to be taken for the major-specific requirements depend on a student's major area of concentration. All students interested in this program should contact Teresa Larkin, Program Director and Liaison at American University for assistance with course planning and scheduling. (tlarkin@american.edu)

Table I. Foundational Courses Required of all Majors

Course Name and Number at Columbia	Equivalent Course Name and Number at American
Mathematics	
Calculus I (UN1101)	Calculus I (MATH-221)
Calculus II (UN1102)	Calculus II (MATH-222)
Multivariate Calculus for Engineers and Applied Scientists (APMA E2000)	Calculus III (MATH-313)
Physics	
Mechanics and Thermodynamics (PHYS UN1401)	Principles of Physics I (PHYS-110)
Electricity, Magnetism, and Optics (PHYS UN1402)	Principles of Physics II (PHYS-210)
Chemistry	
General Chemistry I (CHEM UN1403)	General Chemistry I (CHEM-110)
Lab Requirement	
Introduction to Experimental Physics Lab (PHYS UN1493/4) or General Chemistry Lab (CHEM UN1500)	PHYS-110, PHYS-210, and CHEM-110 all include a lab component.
Computer Science	
Introduction to Computer Science and Programming in C/C++, JAVA, (COMS W1004), Python (ENGI E1006), or MATLAB (COMS W1005)	Introduction to Computer Science I° (CSC-280) °CSC-280 is typically taken by most students to meet this requirement.
Humanities and Social Sciences 27 non-technical credit hours including Principles of Economics (ECON UN1105) and University Writing (ENGL CC1010)	At AU, courses taken to satisfy the AU Core requirements typically fulfill the Humanities and Social Sciences requirements.
Principles of Economics (ECON UN1105)	Macroeconomics (ECON-100)
University Writing (ENGL CC1010)	College Writing (WRTG-100)

Table II. Major-Specific Coursework

Course Name and Number at Columbia	Equivalent Course Name and Number at American
Mathematics and Statistics	
Ordinary Differential Equations (UN2030)	Differential Equations (MATH-321)
Introduction to Applied Mathematics: Ordinary Differential Equations and Linear Algebra (APMA E2101)	Linear Algebra (MATH-310) and Differential Equations (MATH-321)
Linear Algebra (MATH UN2010)	Linear Algebra (MATH-310)
Probability for Engineers (IEOR E3658) or Probability Theory (STAT GU4203)	Probability (MATH-401)
Applied Statistical Models in Operations Research (IEOR E4307) or Statistical Inference (STAT GU4204))	Introduction to Mathematical Stat (STAT-402)
*Introduction to Probability & Statistics (STAT GU4001)	Basic Statistics with Calculus (STAT-203)
Calculus IV (MATH UN1202)	Advanced Calculus of Several Variables (MATH-404)
Computer Science	
Introduction to Computer Science and Programming in Java (COMS W1004)	Introduction to Computer Science II (CSC-281)
Introduction to Computer Science and Programming in MATLAB (COMS W1005)	Introduction to Simulation and Modeling (CSC-432)
Introduction to Computing for Engineers and Applied Scientists in Python (ENGI E1006)	Introduction to Computer Science I (CSC-280)
Honors Introduction to Computer Science in Java (COMS W1007)	Introduction to Computer Science II (CSC-281)
Discrete Mathematics (COMS W3203)	Introduction to Discrete Structures (CSC-350)
Data Structures in Java (COMS W3134)	Introduction to Computer Science II (CSC-281)
Data Structures and Algorithms (COMS W3137)	Algorithms and Data Structures (CSC-420)
Essential Data Structures in C/C++ (COMS W3136)	Algorithms and Data Structures (CSC-420)
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.	No equivalent.
Biology	
Environmental Biology I: Elements to Organisms (EEEB UN2001)	General Biology I (BIO-110)
Introductory Biology I: Biochemistry, Genetics, and Molecular Biology (BIOL UN2005)	General Biology I (BIO-110)
Introductory Biology II: Cell Biology, Development and Physiology (BIOL UN2006)	General Biology II (BIO-210)
Chemistry	
General Chemistry II Lecture (CHEM UN14040 General Chemistry Lab (CHEM UN1500)	General Chemistry II (CHEM-210)
Organic Chemistry I Lecture (CHEM UN2443)	Organic Chemistry I (CHEM-310)

*Organic Chemistry I Lab (CHEM UN2495)	Organic Chemistry I Lab (CHEM-312)
*Organic Chemistry II Lab (CHEM UN2496)	Organic Chemistry II Lab (CHEM-322)
Physical and Analytical Chemistry Lab (CHEM UN3085)	Experimental Chemistry I (CHEM-481)
Environmental Science	
Earth: Origin, Evolution, Processes and Future (EESC UN1011)	Living on Earth (ENVS-250)
*A Better Planet by Design (EAEE E2100)	Environmental Science II (ENVS-260)
*Earth's Environmental Systems: The Climate System (EESC UN2100)	Climatology (ENVS-460)
*Earth's Environmental Systems: The Solid Earth System (EESC UN2200)	Environmental Geology (ENVS-350)
Physics	
Introduction to Classical and Quantum Waves (PHYS UN1403)	Modern Physics (PHYS-331)
Introduction to Experimental Physics Lab (PHYS UN1493/4)	PHYS-110 and PHYS-210 both include a lab component.
Other	
*Introduction to Electrical Engineering (ELEN E1201)	No equivalent.
*Mechanics (ENME E3105)	No equivalent.
*Introduction to Accounting and Finance (IEOR E2261)	Principles of Financial Accounting (ACCT-240)

*Courses with asterisks may be taken at Columbia.