

2019-20 Pre-Combined Plan Curriculum Guide for Wittenberg University Students

Admission into the binary program with The Fu Foundation School of Engineering and Applied Science at Columbia University requires taking a series of courses at Wittenberg equivalent to courses that are offered at Columbia. The equivalent courses that are offered at Wittenberg University are listed below.

You should meet with the combined plan program liaison, Professor of Physics Elizabeth George (egeorge@wittenberg.edu), as early as possible in the process to plan your schedule and to make sure that all of these requirements are satisfied.

FOUNDATIONAL COURSES REQUIRED OF ALL MAJORS:

MATHEMATICS

- A full sequence of Calculus (MATH 201, 202 and 212)

PHYSICS

- Physics I (PHYS 201)
- Calculus-based Physics II (PHYS 203)

CHEMISTRY

- Models of Chemical Systems (CHEM 121)

Please see individual programs below for details. Some programs require an additional second semester of General Chemistry (CHEM 162) or have possible substitutions.

LAB REQUIREMENT

One semester of either physics or chemistry laboratory is generally required and is satisfied when taking the laboratories associated with Physics I (PHYS 201) or Models of Chemical Systems (CHEM 121). Please see individual programs below for more details.

COMPUTER SCIENCE

- Computer Programming I (COMP 150)

Some majors require a specific programming language (see requirements for majors below).

HUMANITIES AND SOCIAL SCIENCES

- Principles of Economics (ECON 190)
- Expository Writing (ENG 101)
- 27 non-technical credit hours. This requirement is often fulfilled through general education credits (or credits for a major) at Wittenberg, but you should check with Prof. George to ensure that you have fulfilled this requirement.

REQUIRED FOR MAJORS IN:

APPLIED MATHEMATICS or APPLIED PHYSICS

MATHEMATICS

- Differential Equations (MATH 215)

PHYSICS

- Modern Physics (PHYS 204)

CHEMISTRY/BIOLOGY (choose one course listed below.)

- Models of Chemical Systems (CHEM 121)
- Concepts of Biology: Biological Information, Reproduction, and Evolution (BIO 170)
- Concepts of Biology: Energy and Resources in Biology (BIO 180)

BIOMEDICAL ENGINEERING (ALL TRACKS)

MATHEMATICS

- Differential Equations (MATH 215)
- Linear Algebra (MATH 261)

PHYSICS

- Modern Physics (PHYS 204)

BIOLOGY

- Concepts of Biology: Biological Information, Reproduction, and Evolution (BIO 170)
- Concepts of Biology: Energy and Resources in Biology (BIO 180)

CHEMISTRY

- Chemical Structure and Analysis (CHEM 162)

ELECTRICAL ENGINEERING

- Introduction to Electrical Engineering (ELEN E1201), which may be taken while at Columbia*

COMPUTER SCIENCE

This program requires that you take a course in PYTHON, which is used in Computer Programming I (COMP 150).

CHEMICAL ENGINEERING

MATHEMATICS (*choose one course listed below*)

- Differential Equations (MATH 215)
- Linear Algebra (MATH 261)

CHEMISTRY

- Chemical Structure and Analysis (CHEM 162)
- Introduction to Organic Chemistry (CHEM 201)

COMPUTER SCIENCE

This program requires that you take a course in PYTHON, which is used in Computer Programming I (COMP 150).

CIVIL ENGINEERING

MATHEMATICS

- Differential Equations (MATH 215)
- Linear Algebra (MATH 261)

GEOLOGY

- Physical Geography (GEOL 150)

COMPUTER SCIENCE

This program strongly recommends that you take a course in MATLAB, but will accept any language; COMP 150 provides the needed Introduction to Computer Science and Programming course in Python.

ENGINEERING MECHANICS

- Mechanics (ENME E3105), which may be taken while at Columbia

COMPUTER ENGINEERING

MATHEMATICS

- Discrete Mathematical Structures (MATH 171)
- Differential Equations (MATH 215)
- Linear Algebra (MATH 261)

COMPUTER SCIENCE

- Computer Programming II (COMP 250).

Note: This program requires Computer Programming in JAVA.

ELECTRICAL ENGINEERING

- Introduction to Electrical Engineering (ELEN E1201), which may be taken while at Columbia.

COMPUTER SCIENCE

MATHEMATICS

- Discrete Mathematics (MATH 171)

COMPUTER SCIENCE

- Computer Programming II (COMP 250)

This program strongly recommends the course in Data Structures be taken in JAVA, which is used in Computer Programming II (COMP 250).

EARTH AND ENVIRONMENTAL ENGINEERING

MATHEMATICS

- Differential Equations (MATH 215)
- Linear Algebra (MATH 261)
- Univariate Probability (MATH 228)
- Mathematical Statistics (MATH 328)

Note: Introduction to Probability and Statistics (W3600) may also be taken at Columbia instead of Univariate Probability (MATH 228) and Mathematical Statistics (MATH 328).

CHEMISTRY

- Chemical Structure and Analysis (CHEM 162)

OTHER SCIENCE ELECTIVE (*choose one option listed below*)

- Introduction to Organic Chemistry (CHEM 201)
- Modern Physics (PHYS 204)
- Concepts of Biology: Biological Information, Reproduction, and Evolution (BIO 170) **and** Concepts of Biology: Energy and Resources in Biology (BIO 180)

EARTH AND ENVIRONMENTAL SCIENCES (*choose one course listed below*)

- The Climate System (EESC V2100) *may be taken while at Columbia.*
- Physical Geology (GEOL 150) **and** Environmental Geology (GEOL 160)
 - The Solid Earth System (EESC V2200) *may be taken while at Columbia instead of these two courses.*

EARTH AND ENVIRONMENTAL ENGINEERING

- Better Planet by Design (EAEE E2200) *to be taken at Columbia.*

ELECTRICAL ENGINEERING

MATHEMATICS

- Differential Equations (MATH 215)
- Linear Algebra (MATH 261)

PHYSICS

- Modern Physics (PHYS 204)

COMPUTER SCIENCE

Computer Programming I (COMP 150) *provides the background necessary to take* Data Structures (COMS W3134 or W3136) *at Columbia.*

ELECTRICAL ENGINEERING

- Introduction to Electrical Engineering* (ELEN E1201) *may be taken while at Columbia.*

ENGINEERING MECHANICS

MATHEMATICS

- Differential Equations (MATH 215)

ENGINEERING MECHANICS

- Mechanics (ENME E3105) *to be taken the summer before entering or while at Columbia*

INDUSTRIAL ENGINEERING, ENGINEERING MANAGEMENT SYSTEMS, OR OPERATIONS RESEARCH

MATHEMATICS

- Differential Equations (MATH 215)
- Data Analysis (MATH 227)
- Univariate Probability (MATH 228)
- Linear Algebra (MATH 261)

COMPUTER SCIENCE

- Computer Programming II (COMP 250)

ECONOMICS

- Managerial Accounting (ACCT 226)

COMPUTER SCIENCE

This program strongly recommends JAVA. Experience with JAVA can be acquired by taking Computer Programming II (COMP 250).

Note: Students cannot apply to the Financial Engineering major until they are already enrolled at Columbia (after one semester of study in Columbia Engineering). Entrance into this program is extremely competitive. Students who are interested in this major should consider the Operations Research, Industrial Engineering or Engineering Management Systems which are housed in the same department (IEOR) as Financial Engineering.

MATERIALS SCIENCE AND ENGINEERING

MATHEMATICS

- Differential Equations (MATH 215)

PHYSICS

- Modern Physics (PHYS 204)

CHEMISTRY

- Chemical Structure and Analysis (CHEM 162)

MECHANICAL ENGINEERING

MATHEMATICS

- Differential Equations (MATH 215)
- Linear Algebra (MATH 261)

PHYSICS/BIOLOGY (*choose one course listed below*)

- Modern Physics (PHYS 204)
- Concepts of Biology: Biological Information, Reproduction, and Evolution (BIO 170)
- Concepts of Biology: Energy and Resources in Biology (BIO 180)

ENGINEERING MECHANICS

- Mechanics (ENME E3105) *may be taken at Columbia.*

ELECTRICAL ENGINEERING

- Introduction to Electrical Engineering (ELEN E1201) *may be taken at Columbia.*