

ATTENTION Class of 2019!
As of September 16, 2015, Columbia has revised some of the pre-engineering requirements. An updated guide will be available by October 15, 2015.

The requirements are unchanged for the Classes of 2016, 2017 and 2018.

Muhlenberg College
PRE - COMBINED PLAN CURRICULUM GUIDE

FOUNDATION COURSES REQUIRED OF ALL MAJORS:

i. MATHEMATICS

- The full sequence of Calculus I, II, III (MTH 121, MTH 122, MTH 223)
- Differential Equations (MTH 227)

ii. PHYSICS

- General Physics I (PHY 121)
- General Physics II (PHY 122)
- Thermal and Statistical Physics (PHY 241 or PHY 242)

iii. CHEMISTRY

- General Chemistry I (CHM 103)

iv. COMPUTER SCIENCE

- Computer Science II (CSI 111),

v. HUMANITIES AND SOCIAL SCIENCES

- All of Muhlenberg's General Academic Requirements, plus
- Principles of Macroeconomics (ECN 101) OR Principles of Microeconomics (ECN 102) AND
- First Year Seminar (FYS XXX)

ECN 101 or ECN 102 may be included in the General Academic Requirements

REQUIRED FOR MAJORS IN:

(Notes in *italics* clarify requirements.)

APPLIED MATHEMATICS or APPLIED PHYSICS

PHYSICS

- Modern Physics (PHY 213)

CHEMISTRY / BIOLOGY (choose one course listed below. Chemistry/Biology labs not required.)

- Principals of Biology III (Bio 152)
- General Chemistry I (CHM 103)

BIOMEDICAL ENGINEERING

ALL TRACKS

MATHEMATICS

- Linear Algebra (MTH 226).

PHYSICS

- Modern Physics (PHY 213)

CHEMISTRY

- General Chemistry II (CHM 104)
- Organic Chemistry I (CHM 201 or CHM 203)

ELECTRICAL ENGINEERING

- Analog and Digital Circuits (PHY 216) [*may be taken the summer before entering or while at Columbia*]

ENGINEERING MECHANICS

- Analytical Mechanics (PHY 319) [Mechanics (ENME E3105) [*may be taken the summer before entering or while at Columbia*]]

CHEMICAL ENGINEERING

MATHEMATICS

- Linear Algebra (MTH 226)

CHEMISTRY

- General Chemistry II (CHM 104)
- Organic Chemistry I (CHM 201 or CHM 203)

CIVIL ENGINEERING

MATHEMATICS

- Linear Algebra (MTH 226).

ENGINEERING MECHANICS

- Analytical Mechanics (PHY 319) [*may be taken the summer before entering or while at Columbia*]

COMPUTER ENGINEERING

MATHEMATICS

- Linear Algebra (MTH 226).

COMPUTER SCIENCE

- (*Computer Programming in JAVA is required.*)
- Transition to Abstract Mathematics (MTH 210)
- Combinatorics and Graph Theory (MTH 345)

ELECTRICAL ENGINEERING

- Analog and Digital Circuits (PHY 216) [*may be taken the summer before entering or while at Columbia*]

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COMPUTER SCIENCE

COMPUTER SCIENCE

- (*Computer Programming in JAVA is required.*)
- Data Structures and Algorithms (CSI 220)

MATHEMATICS

- Transitions to Abstract Mathematics (MTH 240)
- Combinatorics and Graph Theory (MTH 345)

EARTH AND ENVIRONMENTAL ENGINEERING

MATHEMATICS

- Linear Algebra (MTH 226).

CHEMISTRY

- General Chemistry II (CHM 104)

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

- Organic Chemistry (CHM 201 or CHM 203)
- Modern Physics (PHY 213)
- Principles of Biology III (BIO 152)

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

Muhlenberg College does not have equivalents to these courses so they should be taken while at Columbia)

- Advanced General Geology (EESC W4001) [*may be taken while at Columbia.*]
- The Climate System (EESC V2100) [*may be taken while at Columbia.*]
- The Solid Earth System (EESC V2200) [*may be taken while at Columbia.*]

EARTH AND ENVIRONMENTAL ENGINEERING

- Alternative Energy Resources (EAEE E2002) [*may be taken at Columbia*]

ELECTRICAL ENGINEERING

MATHEMATICS

- Linear Algebra (MTH 226)

PHYSICS

- Modern Physics (PHY 213)

COMPUTER SCIENCE

Computer Programming in JAVA (W1007) is recommended.

ELECTRICAL ENGINEERING

- Analog and Digital Circuits (PHY 216) [*may be taken the summer before entering or while at Columbia*]

IEOR: ENGINEERING MANAGEMENT SYSTEMS

MATHEMATICS

- Linear Algebra (MTH 226)

COMPUTER SCIENCE

- Computer Science II (CSI 111)
- Data Structures and Algorithms (CSI 220)

ECONOMICS

- Financial Accounting (ACT 101)

PROBABILITY AND STATISTICS

- Mathematical Statistics I (MTH 331)
- Mathematical Statistics II (MTH 332)

IEOR: FINANCIAL ENGINEERING

Students cannot apply directly to IEOR: Financial Engineering because this concentration in Operations Research requires an application after one semester of study at Columbia. Students interested in this concentration must adhere to the following pre-requisite requirements:

MATHEMATICS

- Linear Algebra (MTH 226)
- Differential Equations (MTH 227)

COMPUTER SCIENCE

- Computer Science II (CSI 111)
- Data Structures and Algorithms (CSI 220)

ECONOMICS

- Financial Accounting (ACT 101)

PROBABILITY AND STATISTICS

- Mathematical Statistics I (MTH 331)
- Mathematical Statistics II (MTH 332)

IEOR: INDUSTRIAL ENGINEERING

MATHEMATICS

- Linear Algebra (MTH 226)

COMPUTER SCIENCE

- Computer Science II (CSI 111)
- Data Structures and Algorithms (CSI 220)

ECONOMICS

- Financial Accounting (ACT 101)

PROBABILITY AND STATISTICS

- Mathematical Statistics I (MTH 331)
- Mathematical Statistics II (MTH 332)

IEOR: OPERATIONS RESEARCH

MATHEMATICS

- Linear Algebra (MTH 226)

COMPUTER SCIENCE

- Computer Science II (CSI 111)
- Data Structures and Algorithms (CSI 220)

ECONOMICS

- Financial Accounting (ACT 101)

PROBABILITY AND STATISTICS

- Mathematical Statistics I (MTH 331)
- Mathematical Statistics II (MTH 332)

ENGINEERING MECHANICS

ENGINEERING MECHANICS

- Analytical Mechanics (PHY 319) [*may be taken the summer before entering or while at Columbia*]

MATERIALS SCIENCE AND ENGINEERING

PHYSICS

- Modern Physics (PHY 213)

CHEMISTRY

- General Chemistry II (CHM 104)

MECHANICAL ENGINEERING

MATHEMATICS

- Linear Algebra (MTH 226).

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

- Modern Physics (PHY 213)
- Principals of Biology III (Bio 152)

ENGINEERING MECHANICS

- Analytical Mechanics (PHY 319) [*may be taken while at Columbia*]

ELECTRICAL ENGINEERING

- Analog and Digital Circuits [*may be taken while at Columbia*]