DePauw University
Courses that satisfy Columbia University pre-requisites

PRE - COMBINED PLAN CURRICULUM GUIDE

2011-2012

The equivalents of the following Columbia courses are required. Please see the SEAS Bulletin for course and program descriptions: www.engineering.columbia.edu/bulletin/. Students must complete the Combined Plan program in four (4) consecutive semesters. Please e-mail combinedplan@columbia.edu with questions regarding course equivalencies. If your institution does not offer a required course listed in this guide, please speak with your liaison about other ways to fulfill the requirement.

FOUNDATION COURSES REQUIRED OF ALL MAJORS:

i. MATHEMATICS
   - The full sequence of Calculus I, II, III, IV (MATH 151, MATH 152, MATH 251).

ii. PHYSICS
   - Mechanics and Thermodynamics (PHYS 120)
   - Electricity, Magnetism, and Optics (PHYS 130)

iii. CHEMISTRY
    - General Chemistry I (CHEM 130)
    Please see individual programs below for details. Some programs require an additional second semester of General Chemistry (CHEM 260) or have possible substitutions.

iv. LAB REQUIREMENT
    Either one-semester physics lab or one-semester chemistry lab is generally required. Please see individual programs below for more details.

v. COMPUTER SCIENCE
    - Introduction to computer science and programming in C++, JAVA, or MATLAB (CSC 121)
    Some majors require a specific programming language (see requirements for majors below).

vi. HUMANITIES AND SOCIAL SCIENCES
    - Twenty-seven-(27)-point nontechnical requirement is satisfied by the course work taken for the bachelor’s degree awarded by the home institution. Among those courses the students must include:
      - Principles of Economics (ECON 100)
      - English Composition (ENG 130 College Writing II).
REQUIRED FOR MAJORS IN:

APPLIED MATHEMATICS or APPLIED PHYSICS

MATHEMATICS
- Ordinary Differential Equations (MATH 363)

PHYSICS
- Classical and Quantum Waves (PHYS 220)
- Physics Lab (Included with PHYS 120 and PHYS 130)

CHEMISTRY / BIOLOGY (choose one course listed below. Chemistry/Biology labs not required.)
- General Chemistry I (CHEM 130)
- Environmental Biology: Molecules to Cells (no DePauw course)
- Introduction to Molecular and Cellular Biology (BIO 215)

BIOMEDICAL ENGINEERING

ALL TRACKS

MATHEMATICS
- Introduction to applied mathematics – Ordinary Differential Equations (MATH 363) & Linear Algebra (MATH 270). Students who take an ODE course must also take a Linear Algebra course.

PHYSICS
- Classical and Quantum Waves (PHYS 220)

CHEMISTRY
- General Chemistry II (CHEM 260)
- General Chemistry Lab (CHEM 130)
- Organic Chemistry I (CHEM 120)

ELECTRICAL ENGINEERING
- Introduction to Electrical Engineering (no DePauw course) [may be taken the summer before entering or while at Columbia]

ENGINEERING MECHANICS
- Mechanics (PHYS 350) [may be taken the summer before entering or while at Columbia]

COMPUTER SCIENCE
Introduction to Computer Science and Programming in MATLAB (no DePauw course) preferred
CHEMICAL ENGINEERING

MATHEMATICS (choose one course listed below)
- Ordinary Differential Equations (MATH 363)
- Introduction to applied mathematics – Ordinary Differential Equations & Linear Algebra (MATH 270)

PHYSICS
- Physics Lab (PHYS 120)

CHEMISTRY
- General Chemistry II (CHEM 260)
- General Chemistry Lab (CHEM 130)
- Organic Chemistry I (CHEM 120)
- Organic Chemistry Lab (CHEM 120)

CIVIL ENGINEERING

MATHEMATICS
- Introduction to applied mathematics – Ordinary Differential Equations (MATH 363) & Linear Algebra (MATH 270). Students who take an ODE course must also take a Linear Algebra course.

PHYSICS/CHEMISTRY LAB (choose one course listed below)
- Physics Lab (PHYS 120)
- General Chemistry Lab (CHEM 130)

ENGINEERING MECHANICS
- Mechanics (PHYS 350) [may be taken the summer before entering or while at Columbia]

COMPUTER SCIENCE
- Introduction to Computer Science and Programming in MATLAB (no DePauw course) preferred

COMPUTER ENGINEERING

MATHEMATICS
- Introduction to applied mathematics – Ordinary Differential Equations (MATH 363) & Linear Algebra (MATH 270). Students who take an ODE course must also take a Linear Algebra course.

PHYSICS/CHEMISTRY LAB (choose one course listed below)
- Physics Lab (PHYS 120)
- General Chemistry Lab (CHEM 130)

COMPUTER SCIENCE (Computer Programming in JAVA (CSC 121) is required.)
- Discrete Mathematics (MATH 123)

ELECTRICAL ENGINEERING
- Introduction to Electrical Engineering (no DePauw course) [may be taken the summer before entering or while at Columbia]
COMPUTER SCIENCE

PHYSICS/CHEMISTRY LAB (choose one course listed below)
- Physics Lab (PHYS 120)
- General Chemistry Lab (CHEM 130)

COMPUTER SCIENCE (Computer Programming in JAVA is required (CSC 121).)
- Data Structures and Algorithms (CSC 122)
- Discrete Mathematics (MATH 123)
- Scientific Computation (no DePauw course)

EARTH AND ENVIRONMENTAL ENGINEERING

MATHEMATICS
- Introduction to applied mathematics – Ordinary Differential Equations (MATH 363) & Linear Algebra (MATH 270). Students who take an ODE course must also take a Linear Algebra course.

CHEMISTRY
- General Chemistry II (CHEM 260)
- General Chemistry Lab (CHEM 130)

OTHER SCIENCE ELECTIVE (choose one course listed below)
- Organic Chemistry (CHEM 120)
- Classical & quantum waves (PHYS 220)
- Introduction to Molecular and Cellular Biology (BIO 215)

EARTH AND ENVIRONMENTAL SCIENCES (choose one course listed below)
- Advanced General Geology (no DePauw course) [may be taken while at Columbia.]
- The Climate System (no DePauw course) [may be taken while at Columbia.]
- The Solid Earth System (no DePauw course) [may be taken while at Columbia.]

EARTH AND ENVIRONMENTAL ENGINEERING
- Alternative Energy Resources (no DePauw course) [may be taken at Columbia]

ELECTRICAL ENGINEERING

MATHEMATICS
- Introduction to applied mathematics – Ordinary Differential Equations (MATH 363) & Linear Algebra (MATH 270). Students who take an ODE course must also take a Linear Algebra course.

PHYSICS
- Classical and Quantum Waves (PHYS 220)
- Physics Lab (PHYS 120 or PHYS 130)

COMPUTER SCIENCE
- Computer Programming in JAVA (CSC 121) is recommended.

ELECTRICAL ENGINEERING
- Introduction to Electrical Engineering (no DePauw course) [may be taken the summer before entering or while at Columbia]
IEOR: ENGINEERING MANAGEMENT SYSTEMS

MATHEMATICS (choose one course listed below)
- Linear Algebra (MATH 270)

PHYSICS/CHEMISTRY LAB (choose one course listed below)
- Physics Lab (PHYS 120)
- General Chemistry Lab (CHEM 130)

COMPUTER SCIENCE (choose one set of courses below)
- Computer Programming in C (no DePauw course)
- Data Structures in C (CSC 122)
- or-
- Computer Programming in JAVA (CSC 121)
- Data Structures in JAVA (no DePauw course)

The Department strongly recommends JAVA over C.

ECONOMICS
- Introduction to Accounting and Finance (ECON 220)

PROBABILITY AND STATISTICS
- Introduction to Probability and Statistics (MATH 247)
  Please note that the course must have calculus as a pre-requisite. The Department strongly suggests taking two separate courses: one in Probability and one in Statistics.

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 (MATH 270)
- Ordinary Differential Equations (MATH 363)

PHYSICS/CHEMISTRY LAB (choose one course listed below)
- Physics Lab (PHYS 120)
- General Chemistry Lab (CHEM 130)

COMPUTER SCIENCE (choose one set of courses below)
- Computer Programming in C (no DePauw course)
- Data Structures in C (CSC 122)
  -or-
- Computer Programming in JAVA (CSC 121)
- Data Structures in JAVA (no DePauw course)

The Department strongly recommends JAVA over C.

ECONOMICS
- Introduction to Accounting and Finance (ECON 220)
PROBABILITY AND STATISTICS
- Probability (MATH 441)
- Statistical Inference (MATH 341)

Please note that the course must have calculus as a pre-requisite.

IEOR: INDUSTRIAL ENGINEERING

MATHEMATICS (choose one course listed below)
- Linear Algebra (MATH 270)

PHYSICS/CHEMISTRY LAB (choose one course listed below)
- Physics Lab (PHYS 120)
- General Chemistry Lab (CHEM 130)

COMPUTER SCIENCE: (choose one set of courses below)
- Computer Programming in C (no DePauw course)
- Data Structures in C (CSC 122)
  -or-
- Computer Programming in JAVA (CSC 121)
- Data Structures in JAVA (no DePauw course)

The Department strongly recommends JAVA over C.

ECONOMICS
- Introduction to Accounting and Finance (ECON 220)

PROBABILITY AND STATISTICS
- Introduction to Probability and Statistics (MATH 247)
  Please note that the course must have calculus as a pre-requisite. The Department strongly suggests taking two separate courses: one in Probability and one in Statistics.
IEOR: OPERATIONS RESEARCH

MATHEMATICS
- Linear Algebra (MATH 270)

PHYSICS/CHEMISTRY LAB (choose one course listed below)
- Physics Lab (PHYS 120)
- General Chemistry Lab (CHEM 130)

COMPUTER SCIENCE (choose one set of courses below)
- Computer Programming in C (no DePauw course)
- Data Structures in C (CSC 122)
  -or-
- Computer Programming in JAVA (CSC 121)
- Data Structures in JAVA (no DePauw course)

The Department strongly recommends JAVA over C.

ECONOMICS
- Introduction to Accounting and Finance (ECON 220)

PROBABILITY AND STATISTICS
- Introduction to Probability and Statistics (MATH 247)
  Please note that the course must have calculus as a pre-requisite. The Department strongly suggests taking two separate courses: one in Probability (MATH 441) and one in Statistics.

ENGINEERING MECHANICS

MATHEMATICS
- Ordinary Differential Equations (MATH 363)

PHYSICS/CHEMISTRY LAB (choose one course listed below)
- Physics Lab (PHYS 120)
- General Chemistry Lab (CHEM 130)

ENGINEERING MECHANICS
- Mechanics (PHYS 350) [may be taken the summer before entering or while at Columbia]

MATERIALS SCIENCE AND ENGINEERING

MATHEMATICS
- Ordinary Differential Equations (MATH 363)

PHYSICS
- Classical and Quantum Waves (PHYS 220)
- Physics Lab (PHYS 120)

CHEMISTRY
- General Chemistry II (CHEM 260)
- General Chemistry Lab (CHEM 130)
MECHANICAL ENGINEERING

MATHEMATICS
- Introduction to applied mathematics – Ordinary Differential Equations (**MATH 363**) & Linear Algebra (**MATH 270**). Students who take an ODE course must also take a Linear Algebra course.

PHYSICS/BIOLOGY (choose one course listed below)
- Classical and Quantum Waves (**PHYS 220**)
- Environmental Biology: Molecules to Cells (**no DePauw course**)
- Introduction to Molecular and Cellular Biology (**BIO 215**)

PHYSICS/CHEMISTRY LAB (choose one course listed below)
- Physics Lab (**PHYS 120**)
- General Chemistry Lab (**CHEM 130**)

ENGINEERING MECHANICS
- Mechanics (**PHYS 350**) [may be taken while at Columbia]

ELECTRICAL ENGINEERING
- Intro. to Electrical Engineering (**no DePauw course**) or equivalent [may be taken while at Columbia]