

We are pleased to announce the creation of two new tracks within the chemistry major through [M.S. Express Application for Students at Columbia University and Barnard.](#)

Chemical Engineering

This chemistry major will enable students to complete a Masters degree in chemical engineering at Columbia in 15 months (one academic year + two summers). This major is designed to be used with the express master's program that offers students with an undergraduate GPA of 3.5 or better an expedited admissions process. To be clear, we have not changed our existing major in any way. We've simply created an additional track through the chemistry major for students with strong quantitative skills and a strong interest in chemical engineering. Copious advising both from faculty in the chemistry department at Barnard and, if helpful, faculty members in the chemical engineering department at Columbia is available. Please speak to your chemistry adviser or email the departmental chair (raustin@barnard.edu) if you have questions.

The following is a comparison between the traditional Chemistry Major and the new Chemical Engineering track:

STANDARD CHEMISTRY MAJOR	NEW OPTIONAL CHEMISTRY FOR STUDENTS INTERESTED IN CHEMICAL ENGINEERING
CHEM BC2001 – General Chemistry w/ lab	CHEM BC2001 – General Chemistry w/ lab
CHEM BC3230 – Organic Chemistry I lecture	CHEM BC3230 – Organic Chemistry I lecture
CHEM BC3231 – Organic Chemistry II lecture	CHEM BC3231 – Organic Chemistry II lecture
CHEM BC3242 – Quantitative Analysis lecture	CHEM BC3242 – Quantitative Analysis lecture
CHEM BC3328 – Introductory Organic Chem lab	CHEM BC3328 – Introductory Organic Chem lab
CHEM BC3333 – Modern Techniques of Organic Chem lab	CHEM BC3333 – Modern Techniques of Organic Chem lab
CHEM BC3338 – Quantitative Analysis lab	CHEM BC3338 – Quantitative Analysis lab
CHEM BC3271 – Inorganic Chemistry	CHEN E2100 - Intro to chemical engineering (3)
An Elective Course	Computer Science Introduction to Computing for Engineers and Applied Scientists in Python

STANDARD CHEMISTRY MAJOR	NEW OPTIONAL CHEMISTRY FOR STUDENTS INTERESTED IN CHEMICAL ENGINEERING
	(ENGI E1006)
Two semesters of college math – we require Calc I and Calc II. If a student has AP/IB credit for Calc I (and Calc II) they must take one to two additional math or quantitative classes, including at least one calculus class.	Calc I, Calc II, APMA E2000 X or Y, and ordinary differential equations
Two semesters of calculus based physics	Two semesters of calculus based physics
CHEM BC3358 – Advanced Spectroscopy lab	CHEM BC3358 – Advanced Spectroscopy lab
CHEM BC3252 – Thermodynamics and kinetics	CHEE E3010 - Principles of chemical engineering thermodynamics (3)
CHEM BC3253 – Quantum Chemistry	CHEN E4230 - Reaction kinetics and reactor design (3)
CHEM BC3358 – Advanced Synthesis Lab	CHEN E3810 – Chemical engineering and applied chemistry lab
A senior capstone experience – minimum is 3599, 8 hours per week of research.	A senior capstone experience – minimum is 3599, 8 hours per week of research. There is a commitment from both chemistry at Barnard and Chemical engineering at Columbia to find chemical engineering labs for students to do research in to fulfill this requirement.

Biomedical Engineering

Course requirements for Biomedical Engineering are:

- ACS Certified Chemistry or Biochemistry majors requirements
- Calc I, Calc II, APMA E2000 X or Y ordinary differential equations
- Computer Science Introduction to Computing for Engineers and Applied Scientists in Python (**ENGI E1006**) (some exposure to **Matlab** would be extremely helpful as well)
- Both semesters of quantitative physiology **BMEN 4001** and **BMEN 4002** (this is optional but highly highly recommended)
- Upon consultation with their adviser, Biochemistry majors may substitute **BMEN 4001** for **BC3282**.

For either program, maintaining a GPA of 3.5 or better is required to take advantage of the express masters program. Students who do not have a 3.5 GPA are not encouraged to pursue either major. For the biomedical engineering program, only students who get a B+(3.3 GPA) or better in both semesters of organic chemistry and both semesters of quantitative physiology are considered to be strong candidates.