

CHEMICAL ENGINEERING (PHD)

Graduate School

Program Website (<https://www.engineering.cornell.edu/cbe/phd-program/>)

CIP: 14.0701 | HEGIS: 0906.00 | NYSED: 76394

Graduate Field

Chemical Engineering (<https://catalog.cornell.edu/graduate-school/chemical-engineering/>)

Program Description

Degree candidates are expected to pursue study and research that will give them a deeper comprehension of the basic and applied sciences and will develop initiative, originality, and creative ability. The thesis or dissertation may involve either research or special projects in such subjects as design, economics, or mathematical analysis. There is no language requirement for students majoring in chemical engineering.

Concentrations

- Advanced materials processing
- Applied math and computational methods
- Biochemical engineering
- Chemical reaction engineering
- Classical and statistical thermodynamics
- Fluid dynamics, rheology, and biorheology
- Heat and mass transfer
- Kinetics and catalysis
- Polymers
- Surface science

Program Information

- Instruction Mode: In Person
- Location: Ithaca, NY
- Minimum Credits for Degree: 138

Program Requirements

- Minimum Semesters for Degree: 5

Graduate School Milestones

- Responsible Conduct of Research Training: Required
- Open Researcher and Contributor ID (ORCID): Required
- Student Progress Reviews (SPR) begin: First Year
- Examination for admission to candidacy (A Exam): Summer of third year
- Defense of Dissertation (B Exam): Spring of seventh year

Field Specific Milestones

- Research progress assessment after first year

Course Requirements

Additional course requirements may be set by the student's Special Committee. Program specific requirements that apply to all students are included below.

Year 1 (Fall)

- CHEME 6920 Principles and Practices of Graduate Research
- CHEME 6130 Advanced Chemical Engineering Thermodynamics

Year 1 (Spring)

- CHEME 6240 Advanced Fluid Mechanics and Heat Transfer

Year 2 (Fall)

- CHEME 6110 Mathematical Methods of Chemical Engineering Analysis

Year 2 (Spring)

- CHEME 6420 Chemical Kinetics and Transport

Before A Exam

- CPR Certification
- First Aid Class
- Complete all required classes

University Graduation Requirements Requirements for All Students

In order to receive a Cornell degree, a student must satisfy academic and non-academic requirements.

Academic Requirements

A student's college determines degree requirements such as residency, number of credits, distribution of credits, and grade averages. It is the student's responsibility to be aware of the specific major, degree, distribution, college, and graduation requirements for completing their chosen program of study. See the individual requirements listed by each college or school or contact the college registrar's office (<https://registrar.cornell.edu/service-resources/college-registrar-directory/>) for more information.

Non-academic Requirements

Conduct Matters. Students must satisfy any outstanding sanctions, penalties or remedies imposed or agreed to under the Student Code of Conduct (Code) or Policy 6.4. Where a formal complaint under the Code or Policy 6.4 is pending, the University will withhold awarding a degree otherwise earned until the adjudication process set forth in those procedures is complete, including the satisfaction of any sanctions, penalties or remedies imposed.

Financial Obligations. Outstanding financial obligations will not impact the awarding of a degree otherwise earned or a student's ability to access their official transcript. However, the University may withhold issuing a diploma until any outstanding financial obligations owing to the University are satisfied.

Learning Outcomes

- Mastery and application of chemical engineering knowledge:
 - Students will demonstrate an understanding of the core subjects in chemical engineering and the ability to apply core subjects to technological applications.
- Problem formulation, analysis, solution and presentation of results:
 - Students will demonstrate the ability to use appropriate chemical engineering techniques, tools and methods to solve engineering problems in the context of courses and independent projects. They will be able to apply those tools to the formulation, analysis and solution of broadly defined problems. They will demonstrate the ability to critically evaluate results.
- Communication of knowledge:
 - Students will demonstrate the ability to describe effectively the formulation, analysis and solution of specific problems in chemical engineering. They will be able to explain the technological importance of the problems and the results they obtained.
- Self-directed learning and professional development:
 - Students will demonstrate the ability to assimilate information from multiple sources to solve original engineering problems of technological importance. They will demonstrate the ability to work with fellow students in individual and team environments. They will acquire an awareness of professional roles in chemical engineering practice. They will recognize that involvement in the chemical engineering profession involves a commitment to life-long learning and continuing development of skills and abilities.