EARTH SCIENCE AND ENGINEERING (MENG)

College of Engineering

Program Website (https://www.engineering.cornell.edu/eas/meng/)

CIP: 40.0601 | **HEGIS:** 0911.00 | **NYSED:** 88188

Program Description

The one-year M.Eng. degree program provides future professional geoscientists or engineers with the geoscience and engineering background they will need to analyze and solve engineering problems that involve Earth System variables and concepts. Individual programs are developed within several established options: Geohydrology, Remote Sensing, Hazards, Applied and Environmental Geophysics, Ocean Science and Technology, and Atmospheric Science.

Program Information

- Instruction Mode: In Person
- Location: Ithaca, NY
- Minimum Credits for Degree: 30

Program Requirements

Incoming students are expected to have a strong background in mathematics, the physical sciences, and chemistry and have a strong interest and substantial background in the geosciences. The 30 credit M.Eng. program is intended to extend and broaden this background to develop competence in a defined number of subject categories. Typical categories for the various options might include:

- Geohydrology: porous media flow, geology, geochemistry, and numerical modeling.
- Remote Sensing: utilization of satellite- and airborne-based remote sensing approaches for time series analysis, land use change and understanding of subsurface phenomena.
- Hazards: interaction between society and natural and anthropogenic hazards, observations and modeling of the systems that generate these hazards, assessment of risk.
- Applied and Environmental Geophysics: geophysics, geology, porous media flow, and computer methods.
- Ocean Science and Technology: acoustical oceanography, observatory infrastructure, observatory cyberinfrastructure, optical oceanography, satellite remote sensing, observatory science and applications related to real-time data streams, and underwater vehicles.
- Atmospheric Science: meteorology, applied climatology, climate dynamics, and climate change.

The courses a student selects in a category will vary depending on the student's background. No courses may be required in some categories, and the categories can be adjusted to the student's interest and needs. Alternatives to numerical modeling in the Geohydrology option could be economics or biochemistry, for example. To count toward the 30 credit degree requirement, courses must be at a graduate or advanced undergraduate level.

At least 10 of the 30 credits in the program must involve engineering design. Much of this requirement is normally met through a design project, which can account for over one-third of the program (12 of 30 credits) and must constitute at least 3 credits. The design project must involve a significant geoscience or technology component and lead to concrete conclusions or recommendations of an engineering nature. The project topic can be drawn from a student's nonacademic work experience which is then carried out or further developed with advice from a Cornell faculty member with expertise in the project area. A design project in Geohydrology would normally involve groundwater flow and mass transport. A design project in Applied and Environmental Geophysics might involve implementation of a field survey using seismological, geoelectrical, or ground-penetrating radar methods to map subsurface stratigraphic or structural features that control groundwater flow or contamination at a site. A design project in Ocean Science and Technology might involve aspects in the design, implementation, or operation of ocean observing systems. A design project in Atmospheric Science could be an improved methodology for forecasting weather. Projects are presented both in written form and orally in a design seminar at the end of the year.

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.

Graduation Requirements for Master of Engineering Degree (M.Eng.) Programs

Requirements

The following are general requirements for graduation that apply to all Master of Engineering degrees offered on the Ithaca campus. The individual program pages provide additional information about discipline-specific requirements.

Credits and Residency Units

- Satisfactory completion of 30 technical credits, of which:
  - At least 21 credits must be earned at Cornell. (Some M.Eng. programs allow up to 9 transfer credits of letter-graded coursework completed outside of Cornell to be applied to the M.Eng. degree.)
  - At least 12 credit hours must be in coursework from the home M.Eng. program (as determined by the program).
  - A maximum of two credit hours graded on an S/U basis may be included.
- The credit hours of any course in which a student receives a grade below C- will not count toward the Master of Engineering degree.
- Students must maintain a course load of at least 12 credit-bearing hours[1] each semester.
- Students may not enroll in more than 20 credit-bearing hours per semester.
- Students must complete two full-time residency units[1] (semesters) as registered M.Eng. students. Winter and summer sessions do not count as residency units.

[1] Course load and residency unit exceptions apply for Distance Learning program students, employee degree program students, and Industrial Partnership Program students. The residency unit requirement is one full-time registered semester for Early Admit M.Eng. students and certain Cornell MPS/MS/PhD student transfers.

Courses

- Only program-approved courses at the 5000 level and above may count toward the M.Eng. degree.
- Courses covering subject matter previously taken at Cornell may not be repeated for credit.
- Satisfactory completion of an engineering design project bearing 3 or more credit hours and including a formal written report.

Other Requirements

- A grade-point average of 2.50 or above is required across all Cornell courses which count for credit towards the M.Eng. degree.
- Students must complete all degree requirements within four calendar years of their first enrollment in the M.Eng. program (six years for distance learning students), inclusive of any leaves of absence.
- Students must complete the M.Eng. Exit Survey prior to graduation.