APPLIED MATHEMATICS MINOR

College of Engineering

Program Website (https://math.cornell.edu/research/applied-mathematics/)

Program Description

Offered jointly by the Sibley School of Mechanical and Aerospace Engineering and Department of Mathematics.

All Engineering undergraduates affiliated with all Engineering majors are eligible to participate in the Applied Mathematics minor.

Academic Standards

At least C in each course in the minor.

Minor Requirements

To complete the minor, students must take MATH 2930 Differential Equations for Engineers, MATH 2940 Linear Algebra for Engineers, and at least six (6) courses beyond MATH 2940 Linear Algebra for Engineers, to be chosen as follows:

- At most one course may be chosen from each of groups 1-4.
- At least three courses must be chosen from groups 5 and 6.
- At most one 2000-level course may be chosen.
- At most one course may be chosen that is offered by the student's major department.

Note: Students will not receive credit for MATH 4200 Differential Equations and Dynamical Systems (Group 1) and MAE 5790 Nonlinear Dynamics and Chaos/MATH 4210 Nonlinear Dynamics and Chaos (Group 6) if both are taken.

Group 1: Analysis

Code	Title	Hours
MATH 4200	Differential Equations and Dynamical Systems	3

Group 2: Computational Methods

Code	Title	Hours
CS 4210	Numerical Analysis and Differential Equations	4
ENGRD 3200	Engineering Computation (crosslisted)	4
ORIE 3300	Optimization I	4

Group 3: Probability and Statistics

Code	Title	Hours
CEE 3040	Uncertainty Analysis in Engineering	4
ECE 3100	Introduction to Probability and Inference for Random Signals and Systems	4
ENGRD 2700	Eng Probability and Statistics: Modeling and Data Science	4
MATH 4710	Basic Probability	4
ORIE 3500	Eng Probability and Statistics: Modeling and Data Science II	4

Group 4: Applications

Code	Title	Hours
AEP 3330	Mechanics of Particles and Solid Bodies	4
CEE 3310	Fluid Mechanics	4
CEE 3710	Structural Modeling and Behavior	4
CHEME 3230	Fluid Mechanics	4
CS 2800	Mathematical Foundations of Computing	4
CS 2850	Networks	3
ECE 4250	Digital Signal Processing and Statistical Inference	4
MAE 3230	Introductory Fluid Mechanics	4
MSE 3030	Thermodynamics of Condensed Systems	4
MATH 3610	Mathematical Modeling	4

Group 5: Advanced Courses

Only one of the following may be chosen:

Code	Title	Hours
MATH 4200	Differential Equations and Dynamical Systems	3
MAE 6750		

Only one of the following two may be chosen:

Code	Title	Hours
ECE 4110	Random Signals in Communications and Signal Processing	4
ORIE 3510	Stochastic Processes for Decision-Making (crosslisted)	4

Also, you may choose from:

Code	Title	Hours
CS 4810	Introduction to Theory of Computing	3
CS 4220	Numerical Analysis: Linear and Nonlinear Problems (crosslisted)	4
CS 4820	Introduction to Analysis of Algorithms	4
ORIE 3310	Optimization II	4
ORIE 4330	Discrete Models	4
ORIE 4350	Introduction to Game Theory	4
ORIE 5600	Financial Engineering with Stochastic Calculus I	4
MAE 4730	Intermediate Dynamics	3
MAE 5730	Intermediate Dynamics	3
ORIE 5610	Financial Engineering with Stochastic Calculus II	4
MAE 5790	Nonlinear Dynamics and Chaos	3
or MATH 4210	Nonlinear Dynamics and Chaos	
MAE 6700	Advanced Dynamics	3
MAE 6810	Methods of Applied Mathematics I	3

Group 6: Mathematics Courses

Any 3000+ level course offered by the Mathematics Department in algebra, analysis, probability/statistics, geometry, or logic, with the following exceptions:

a. if any course from group 1 is chosen:

Code	Title	Hours
MATH 4200	Differential Equations and Dynamical Systems	3

b. if any course from group 3 is chosen:

Code	Title	Hours
MATH 4710	Basic Probability	4

c. if AEP 4220 is chosen from group 5:

Code	Title	Hours
MATH 4220	Applied Complex Analysis	3

d. Only one of the following may be chosen:

Code	Title	Hours
MATH 3320	Introduction to Number Theory	4
MATH 3360	Applicable Algebra	4

Graduation Requirements for Engineering Minor Degree Programs

Requirements

Students may pursue minors in any department in any college that offers them, subject to limitations placed by the department offering the minor or by the students' major. Completed minors will appear on the student's transcript. Not all departments offer minors. Additional information on specific minors can be found above, in the *Engineering Undergraduate Handbook*, in the undergraduate major office of the department or school offering the minor, and in Engineering Advising.

An engineering minor recognizes formal study of a particular subject area in engineering normally outside the major. Students undertaking a minor are expected to complete the requirements during the time of their continuous undergraduate enrollment at Cornell. Completing the requirements for an engineering minor (along with a major) may require more than the traditional eight semesters at Cornell. However, courses that fulfill minor requirements may also satisfy other degree requirements (e.g., distribution courses, advisor-approved, or major-approved electives), and completion within eight semesters is possible.

An engineering minor requires:

- successful completion of all requirements for an undergraduate degree.
- enrollment in a major that approves participation in the minor.
- satisfactory completion of six courses (at least 18 credits) in a college-approved minor.

Students may apply for certification of a minor at any time after the required course work has been completed in accordance with published standards. An official notation of certification of a minor appears on the Cornell transcript following graduation.