

Minor in Applied Mathematics

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

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Eligibility: Engineering undergraduates affiliated with all Engineering Majors are eligible to participate in the Applied Mathematics minor. Pre-approval of minor plan is required.

Educational Objectives: This minor is aimed at providing a focus for students who are interested in applied mathematics.

Requirements: To complete the minor, students must take MATH 2930, MATH 2940, and at least six (6) courses beyond MATH 2940, to be chosen as follows:

- At most one course may be chosen from each of groups 1 – 4 (see sample program below)
- 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 (Group 1) and MAE 5790/MATH 4210 (Group 6) if both are taken.

Academic Standards: A grade of C or better in each course.

SAMPLE PROGRAM:

<i>MAE 3100 (Group 1)</i>	<i>MAE 4730/5730 (Group 5)</i>
<i>ENGRD 3200 (Group 2)</i>	<i>MAE 6810 (Group 5)</i>
<i>ENGRD 2700 (Group 3)</i>	<i>MATH 3320 (Group 6)</i>

Group 1: Analysis:

AEP 4210: Mathematical Physics I
MAE 3100: Introduction to Applied Mathematics
MATH 3230: Introduction to Differential Equations
MATH 4200: Diff. Equations and Dynamical Systems**

Group 2: Computational Methods:

CS 4210: Numerical Analysis and Differential Equations
ENGRD 3200: Engineering Computation
ENGRD 3220: Introduction to Scientific Computation
ORIE 3300: Optimization I

Group 3: Probability and Statistics:

CEE 3040: Uncertainty Analysis in Engineering
ECE 3100: Introduction to Probability and Inference for Random Signals and Systems
ENGRD 2700: Basic Engineering Probability and Statistics
MATH 4710: Basic Probability
ORIE 3500: Engineering Probability and Statistics II

Group 4: Applications:

AEP 3330: Mechanics of Particles and Solid Bodies
CEE 3310: Fluid Mechanics
CEE 3710: Structural Modeling and Behavior
CHEME 3230: Fluid Mechanics
CS 2800: Discrete Structures
CS 2850: Networks
ECE 3200: Networks and Systems
ECE 4250: Digital Signal and Image Processing
MAE 3230: Introductory Fluid Mechanics
MSE 3030: Thermodynamics of Condensed Systems
MATH 3610: Mathematical Modeling

Group 5: Advanced Courses:

Only one of the following may be chosen:
AEP 4220: Mathematical Physics II
MATH 4220: Applied Complex Analysis
MAE 6750: Nonlinear Vibrations

Only one of the following may be chosen:

ECE 4110: Random Signals in Communications and Signal Processing
ORIE 3510: Intro. to Engineering Stochastic Processes I

Also, you may choose from:

CS 4810: Introduction to Theory of Computing
CS 4220: Numerical Analysis: Linear and Nonlinear Problems
CS 4820: Introduction to Analysis of Algorithms
ORIE 3310: Optimization II
ORIE 4330: Discrete Models
ORIE 4350: Introduction to Game Theory
ORIE 4520: Introduction to Engineering Stochastic Processes II
ORIE 5600: Financial Engineering with Stochastic Calculus I
ORIE 5610: Financial Engineering with Stochastic Calculus II
MAE 4730/5730: Intermediate Dynamics and Vibrations
MAE 5790/MATH 4210: Nonlinear Dynamics and Chaos**
MAE 6700: Advanced Dynamics
MAE 6810: Methods of Applied Mathematics I
MAE 6820: Methods of Applied Mathematics II
MAE 6840: Asymptotics and Perturbation Methods

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:

- MATH 3230 or MATH 4200, if any course from group 1 is chosen.
- MATH 4710, if any course from group 3 is chosen.
- MATH 4220, if AEP 4220 is chosen from group 5.
- Only one of the following may be chosen:
 - MATH 3320: Introduction to Number Theory
 - MATH 3360: Applicable Algebra