Progress Toward Completion of the Mathematics Major
Operations Research Concentration

Arts and Sciences students may be admitted to the math major after successfully completing a semester of multivariable calculus, a semester of linear algebra, and a 3- or 4-credit computer programming course. Applications are available in 310A Malott Hall.

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<tr>
<th>Student’s Name</th>
<th>Net ID</th>
<th>Faculty Advisor</th>
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Courses needed to complete the major

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Math majors must complete 9 courses for the major, as described in items 1–3 below, with a minimum grade of C−.

No course may be used to satisfy more than one requirement.

At least two of the MATH courses taken must be at the 4000 level (or above).

1. Two Courses in Algebra. (___ transfer credit applied, see reverse)
   - _____ MATH 3320  Introduction to Number Theory
   - _____ MATH 3340* Abstract Algebra
   - _____ MATH 3360* Applicable Algebra
   - _____ MATH 4310* Linear Algebra
   - _____ MATH 4330* Honors Linear Algebra
   - _____ MATH 4340* Honors Introduction to Algebra
   - _____ MATH 4370  Computational Algebra
   - _____ MATH 4500  Matrix Groups
   - _____ MATH 4560  Geometry of Discrete Groups

2. Two Courses in Analysis. (___ transfer credit applied, see reverse)
   - _____ MATH 3110* Introduction to Analysis
   - _____ MATH 3210  Manifolds & Differential Forms
   - _____ MATH 3230* Introduction to Differential Equations
   - _____ MATH 4130* Honors Intro Analysis I
   - _____ MATH 4140  Honors Intro Analysis II
   - _____ MATH 4180* Complex Analysis
   - _____ MATH 4200* Differential Equations and Dynamical Systems
   - _____ MATH 4210* Nonlinear Dynamics and Chaos [also MAE 5790]
   - _____ MATH 4220* Applied Complex Analysis
   - _____ MATH 4250  Numerical Analysis and Differential Equations [also CS 4210]
   - _____ MATH 4260  Numerical Analysis: Linear & Nonlinear Equations [also CS 4220; co-meets w/CS 5223]
   - _____ MATH 4280* Introduction to Partial Differential Equations

*Forbidden Overlaps: Due to an overlap in content, students will receive credit for only one course in each group:
   (1) MATH 3110, 4130; (2) MATH 3230, 4280; (3) MATH 3340, 3360; (4) MATH 3340, 4340; (5) MATH 4180, 4220; (6) MATH 4200, 4210; (7) MATH 4310, 4315, 4330; (8) MATH 4710, ECON 3130, BTRY 3080; (9) MATH 4720, ECON 3130, BTRY 4090; (10) MATH 4810, 4860.
3. **Concentration in Operations Research.** (___ transfer credit applied, see below)

Five additional courses from (xiv) and (xv) below.

(xiv) At least one MATH course numbered 3000 or above:

___  _____________________________________________________________

___  _____________________________________________________________

(xv) At least three courses in ORIE in which the primary focus involves mathematical techniques:

___ ORIE 3300 Optimization I [co-meets w/ORIE 5300]
___ ORIE 3310 Optimization II [co-meets w/ORIE 5310]
___ ORIE 3500 Engineering Probability and Statistics II [co-meets w/ORIE 5500]
___ ORIE 3510 Introduction to Engineering Stochastic Processes I
   [also STSCI 3510; co-meets w/ORIE 5510]
___ ORIE 4150 Economic Analysis of Engineering Systems [co-meets w/ORIE 5150]
___ ORIE 4300 Optimization Modeling
___ ORIE 4330 Discrete Models
___ ORIE 4350 Introduction to Game Theory
___ ORIE 4520 Introduction to Engineering Stochastic Processes II
___ ORIE 4600 Introduction to Financial Engineering
___ ORIE 4740 Statistical Data Mining I
___ ORIE 5600 Financial Engineering with Stochastic Calculus I
___ ORIE 5610 Financial Engineering with Stochastic Calculus II
___ ORIE 5640 Statistics for Financial Engineering [also STSCI 5640]
___  _____________________________________________________________ (approved by faculty advisor)

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**Transfer Credit / Study Abroad Courses Applied to the Major**

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<tr>
<th>Course Number &amp; Title</th>
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