

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.

| Student's Name | Net ID | Faculty Advisor |
|---|--------|-----------------|
| _____ | _____ | _____ |
| Courses needed to complete the major | | |
| _____ | | initials _____ |
| _____ | | date _____ |

Math majors must complete **9 courses** for the major, as described in items 1–3 below, with a **minimum grade of C–**. MATH courses numbered 5000–5999 do not count. 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 4315* Linear Algebra with Supplements

_____ 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 4360 A Mathematical Examination of Fair Representation
 - _____ ORIE 4520 Introduction to Engineering Stochastic Processes II
 - _____ ORIE 4600 Introduction to Financial Engineering
 - _____ ORIE 4630 Operations Research Tools for 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)

Transfer Credit / Study Abroad Courses Applied to the Major

| Course Number & Title | Institution | Requirement |
|-----------------------|-------------|-------------|
|-----------------------|-------------|-------------|

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