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. To apply, visit math.cornell.edu/major.

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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. MATH courses numbered between 4980 and 5999 do not count.

_____ 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]
   _____ 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:

____  ________________________________________________________________________________

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

____ ORIE 3300 - Optimization I
____ ORIE 3310 - Optimization II
____ ORIE 3500 - Engineering Probability and Statistics II
____ ORIE 3510 - Introduction to Engineering Stochastic Processes I [also STSCI 3510]
____ ORIE 4350 - Introduction to Game Theory
____ ORIE 4580 – Simulation Modeling and Analysis
____ ORIE 4600 - Introduction to Financial Engineering
____ ORIE 4630 - Operations Research Tools for Financial Engineering [also STSCI 4630]
____ ORIE 4740 - Statistical Data Mining I
____ ORIE 4741 - Learning with Big Messy Data
____ 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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<th>Course Number &amp; Title</th>
<th>Institution</th>
<th>Requirement</th>
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