Progress Toward Completion of the Mathematics Major

Mathematical Physics 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 320 - 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 Mathematical Physics.** (___ transfer credit applied, see below)

Five additional courses from (xii) and (xiii) below.

(xii) At least one MATH course numbered 3000 or above.

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(xiii) At least three physics courses that make significant use of advanced mathematics:

- PHYS 3316 - Basics of Quantum Mechanics
- PHYS 3317 - Applications of Quantum Mechanics
- PHYS 3318 - Analytical Mechanics
- PHYS 3327 - Advanced Electricity and Magnetism
- PHYS 4230 - Statistical Thermodynamics [also AEP 4230]
- PHYS 4443 - Intermediate Quantum Mechanics
- PHYS 4444 - Introduction to Particle Physics
- PHYS 4445 - Introduction to General Relativity [also ASTRO 4445]
- PHYS 4454 - Introductory Solid State Physics [also AEP 4500]
- PHYS 4481 - Quantum Information Processing [also CS 4812]
- PHYS 4488 - Statistical Mechanics
- AEP 4340 - Fluid and Continuum Mechanics
- AEP 4400 - Nonlinear and Quantum Optics

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(approved by faculty advisor)

Note: Double majors with physics may count eligible physics courses toward both the physics major and the math major’s math physics concentration; however, Physics will not approve outside concentrations in the same area as a student’s second major.

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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>
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