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. 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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<tr>
<td>Courses needed to complete the major</td>
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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-**. 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 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.

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

- PHYS 3314 Intermediate Mechanics
- PHYS 3316 Basics of Quantum Mechanics
- PHYS 3318 Analytical Mechanics
- PHYS 3323 Intermediate Electricity and Magnetism
- PHYS 3327 Advanced Electricity and Magnetism
- PHYS 3341 Thermodynamics and Statistical Physics
- 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 4480 Computational Physics [co-meets with ASTRO 7690, PHYS 7680]
- PHYS 4481 Quantum Information Processing [also CS 4812; co-meets with PHYS 7681]
- AEP 4340 Fluid and Continuum Mechanics
- AEP 4400 Quantum and Nonlinear Optics

Note: If you will also complete a physics major with an outside concentration, the physics courses checked off here may not be counted toward both majors. Please consult with your physics advisor.

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

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