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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Courses needed to complete the major

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<th>Courses</th>
<th>Initials</th>
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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 3370  Computational Algebra
   - MATH 4300  Matrix Groups
   - MATH 4500  Matrix Groups

2. **Two Courses in Analysis.** (___ transfer credit applied, see reverse)
   - MATH 3100*  Introduction to Analysis
   - MATH 3210  Manifolds & Differential Forms
   - 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.

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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; co-meets with PHYS 7681]
___ PHYS 4488 Statistical Mechanics [co-meets with PHYS 6562]
___ AEP 4340 Fluid and Continuum Mechanics
___ AEP 4400 Quantum and Nonlinear 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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<tr>
<th>Course Number &amp; Title</th>
<th>Institution</th>
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