### 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.*

<table>
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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>Course Code</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 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.

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

____ PHYS 3316 Basics 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 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

__________________________ (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, math courses that are being used for an outside concentration for the physics major may not also be counted for the math 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>
<th>Requirement</th>
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