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>Course Details</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–. Two-credit courses count as half courses. No course may be used to satisfy more than one requirement for the major. MATH courses numbered between 5000 and 5999 do not count toward the major.

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 3360 Applicable Algebra
   - _____ MATH 4310* Introduction to Analysis
   - _____ MATH 4320 Introduction to Algebra / _____ 4330 Honors Linear Algebra
   - _____ MATH 4340 Honors Introduction to Algebra
   - _____ MATH 4370 Computational Algebra
   - _____ MATH 4500 Matrix Groups

2. Two Courses in Analysis.
   - _____ transfer credit applied (see reverse)
   - _____ MATH 3110* Introduction to Analysis
   - _____ MATH 3210 Manifolds and Differential Forms
   - _____ MATH 3230* Introduction to Differential Equations
   - _____ MATH 4130* Honors Introduction to Analysis I
   - _____ MATH 4140 Honors Introduction to 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 4240 Wavelets and Fourier Series
   - _____ MATH 4250 Numerical Analysis and Differential Equations [also CS 4210]
   - _____ MATH 4260 Numerical Analysis: Linear and Nonlinear Problems [also CS 4220; co-meets w/CS 5223]
   - _____ MATH 4280* Introduction to Partial Differential Equations

*Overlapping content: Students will receive credit for only one course in each group: (1) MATH 3110, 4130; (2) MATH 3230, 4280; (3) MATH 4180, 4220; (4) MATH 4310, 4330; (5) MATH 4320, 4340; (6) MATH 4710, ECON 3130 (formerly 3190), BTRY/ILRST/STSCI 3080; (7) MATH 4720, ECON 3130 (formerly 3190), BTRY 4090; (8) 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 Continuum Physics
- AEP 4400 Quantum and Nonlinear Optics

(approved by faculty advisor)

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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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.

*Overlapping content:* Students will receive credit for only one course in each group; (1) MATH 3110, 4130; (2) MATH 3230, 4280; (3) MATH 4180, 4220; (4) MATH 4310, 4330; (5) MATH 4320, 4340; (6) MATH 4710, ECON 3130 (formerly 3190), BTRY/ILRST/STSCI 3080; (7) MATH 4720, ECON 3130 (formerly 3190), BTRY 4090; (8) MATH 4810, 4860.