Progress Toward Completion of the Mathematics Major

Computer Science 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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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.

1. Two Courses in Algebra.

   _____ transfer credit applied (see reverse)
   
   _____ MATH 3320 Introduction to Number Theory
   _____ MATH 3360 Applicable Algebra
   _____ MATH 4310 Linear Algebra / _____ MATH 4330 Honors Linear Algebra
   _____ MATH 4320 Introduction to 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 Computer Science. ____ transfer credit applied (see below)

Five courses from (v) and (vi) below.

(v) At least one MATH course numbered 3000 or above:

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(vi) At least three CS courses with significant mathematical content.

_____ CS 4110 Programming Languages and Logics [co-meets with CS 5110]
_____ CS 4210 Numerical Analysis and Differential Equations [also MATH 4250]
_____ CS 4220 Numerical Analysis: Linear and Nonlinear Problems [also MATH 4260; co-meets w/CS 5223]
_____ CS 4620 Introduction to Computer Graphics [co-meets with CS 5620]
_____ CS 4670 Introduction to Computer Vision [co-meets with CS 5670]
_____ CS 4700 Foundations of Artificial Intelligence
_____ CS 4740 Introduction to Natural Language Processing
   [also COGST 4740, LING 4474; co-meets with CS 5740]
_____ CS 4758 Robot Learning [also ECE 4758, MAE 4758; co-meets with CS 6758]
_____ CS 4775 Computational Genetics and Genomics [also BTRY 4840]
_____ CS 4780 Machine Learning for Intelligent Systems [co-meets with CS 5780]
_____ CS 4810 Introduction to Theory of Computing
_____ CS 4812 Quantum Information Processing [also PHYS 4481; co-meets with PHYS 7681]
_____ CS 4820 Introduction to Analysis of Algorithms
_____ CS 4830 Introduction to Cryptography [co-meets with CS 5830]
_____ CS 4850 Mathematical Foundations for the Information Age
_____ CS 4852 Networks II [also ECON 3825, INFO 4220; co-meets with INFO 6220]
_____ CS 4860 Applied Logic [also MATH 4860]

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Note: There are also many CS graduate courses with significant mathematical content that may be used. Interested students should discuss these options with their math faculty advisor (after being admitted to the math major.)

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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*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.