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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<th>Course</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 4330*  Honors Linear Algebra
   - MATH 4340*  Honors Linear Algebra with Supplements
   - 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 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 Theory of Computing
_____ CS 4810 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: Market Design [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.)

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