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.

Student's Name

__________________________________________________

Net ID

________

Faculty Advisor

__________________

Courses needed to complete the major

__________________________________________________

initials __________

date __________

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 4315* Linear Algebra with Supplements

_____ 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 Computer Science.** (___ transfer credit applied, see below)

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

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

___ _______________________________________________________________________________

___ _______________________________________________________________________________

(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 Robot Learning [also ECE 4758, MAE 4758; co-meets with CS 6758]
___ CS 4755 Computational Genetics and Genomics [also BTRY 4840; co-meets with BTRY 6840]
___ CS 4780 Machine Learning for Intelligent Systems [co-meets with CS 5780]
___ CS 4786 Machine Learning for Data Science [co-meets with CS 5786]
___ 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: Market Design [also ECON 3825, INFO 4220; co-meets with INFO 6220]
___ CS 4860 Applied Logic [also MATH 4860]

___ _______________________________________________________________________________

(approved by faculty advisor)

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>
<th>Institution</th>
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