AMSC
Applied Mathematics & Scientific Computation

**AMSC460**
Computational Methods
Credits: 3
Grading Method: Regular, Pass-Fail, Audit

Prerequisite: 1 course with a minimum grade of C- from (MATH240, MATH461, MATH341); and 1 course with a minimum grade of C- from (MATH340, MATH241); and 1 course with a minimum grade of C- from (CMSC106, CMSC131). Also offered as: CMSC460. Credit only granted for: AMSC460, CMSC460, AMSC466, or CMSC466.

Basic computational methods for interpolation, least squares, approximation, numerical quadrature, numerical solution of polynomial and transcendental equations, systems of linear equations and initial value problems for ordinary differential equations. Emphasis on methods and their computational properties rather than their analytic aspects. Intended primarily for students in the physical and engineering sciences.

<table>
<thead>
<tr>
<th>Section</th>
<th>Instructor</th>
<th>Seats (Total)</th>
<th>Open</th>
<th>Waitlist</th>
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<tbody>
<tr>
<td>0101</td>
<td>Harland Glaz</td>
<td>33</td>
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<tr>
<td></td>
<td>TuTh 12:30pm - 1:45pm</td>
<td>MTH 0304</td>
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<td>0201</td>
<td>Changhui Tan</td>
<td>25</td>
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<td>TuTh 2:00pm - 3:15pm</td>
<td>MTH 0409</td>
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**AMSC466**
Introduction to Numerical Analysis I

Credits: 3
Grading Method: Regular, Pass-Fail, Audit

Prerequisite: 1 course with a minimum grade of C- from (MATH240, MATH461, MATH341); and 1 course with a minimum grade of C- from (MATH340, MATH241); and 1 course with a minimum grade of C- from (CMSC106, CMSC131). Also offered as: CMSC466. Credit only granted for: AMSC460, CMSC460, AMSC466, or CMSC466.

Floating point computations, direct methods for linear systems, interpolation, solution of nonlinear equations.

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<tr>
<td>0101</td>
<td>Maria Cameron</td>
<td>25</td>
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<td>MWF 11:00am - 11:50am</td>
<td>MTH 1311</td>
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**AMSC498A**
Selected Topics in Applied Mathematics

Credits: 1-3
Grading Method: Regular, Pass-Fail, Audit
Topics in applied mathematics of special interest to advanced undergraduate students.

Contact department for information to register for this course.

AMSC614  Mathematics of the Finite Element Method
Credits: 3  Grading Method: Regular, Audit
Prerequisite: Must have completed one semester graduate level course in partial differential equations; or permission of instructor.

Variational formulations of linear and nonlinear elliptic boundary value problems; formulation of the finite element method; construction of finite element subspaces; error estimates; eigenvalue problems; time dependent problems.

0101  Ricardo Nochetto  Seats (Total: 25, Open: 17, Waitlist: 0)
TuTh 5:00pm - 6:15pm  MTH 1313

AMSC660  Scientific Computing I
(Perm req)
Credits: 3  Grading Method: Regular
Prerequisite: Must have knowledge of C or Fortran. And AMSC460 or CMSC460; or (CMSC466 or AMSC466); or (must have knowledge of basic numerical analysis (linear equations, nonlinear integration, interpolation); and permission of instructor). Also offered as: CMSC660. Credit only granted for: AMSC660 or CMSC660.

Monte Carlo simulation, numerical linear algebra, nonlinear systems and continuation method, optimization, ordinary differential equations. Fundamental techniques in scientific computation with an introduction to the theory and software of each topic.

0101  Ramani Duraiswami  Seats (Total: 35, Open: 22, Waitlist: 0)
TuTh 3:30pm - 4:45pm  CSI 3120

AMSC663  Advanced Scientific Computing I
(Perm req)
Credits: 3  Grading Method: Regular
Prerequisite: CMSC660 or AMSC660; and (CMSC661 or AMSC661). Restriction: Permission of instructor. Also offered as: CMSC663. Credit only granted for: AMSC663 or CMSC663.

In the sequence AMSC663, AMSC664 students work on a year-long individual project to develop software for a scientific task in a high performance computing environment. Lectures will be given on available computational environments, code development, implementation of parallel algorithms.
AMSC666  
**Numerical Analysis I**

Credits: 3  
Grading Method: Regular, Audit

Prerequisite: CMSC466 or AMSC466; and MATH410. Also offered as: CMSC666. Credit only granted for: AMSC666 or CMSC666.

Approximation theory, numerical solution of initial-value problems, iterative methods for linear systems, optimization.

Click here for more course information.

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AMSC673  
**Partial Differential Equations I**

Credits: 3  
Grading Method: Regular, Audit

Prerequisite: MATH411; or students who have taken courses with comparable content may contact the department. Also offered as: MATH673. Credit only granted for: AMSC673 or MATH673.


Offered fall only. Also offered as MATH673.

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AMSC689  
**Research Interactions in Applied Mathematics and Scientific Computation**

(Perm req)  
Credits: 1-3  
Grading Method: Regular, Audit

The students participate in a vertically integrated (undergraduate, graduate and/or postdoctoral, faculty) research group. Format varies, but includes regular meetings, readings and presentations of material. See graduate program's online syllabus or contact the graduate program director for more information.

Contact department for information to register for this course.
**AMSC760**  
Applied Statistics Practicum  
Credits: 3  
Grading Method: Regular  

Prerequisite: Must have completed one year of graduate study in Applied Statistics. Restriction: Must have project proposal approved by SAC coordinator.

A semester long applied applied statistical project (a minimum 10 hours per week or 120 hours in total), in an internship of collaborative research-laboratory setting working on a substantive applied quantitative project with significant statistical content.

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<tr>
<th>0101</th>
<th>Hector Corrada Bravo</th>
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**AMSC762**  
Data Analysis Project  
Credits: 1  
Grading Method: Regular  

This course cannot be used to meet any of the Applied Statistics Area's seminar requirements. Offered yearly, required of and limited to MS non-thesis and doctoral students in Applied Statistics Area, for whom the resulting projects serve as a Qualifying Exam component. After 5-6 lectures or presentations on components of successful data analyses and write-ups, 3-4 sessions will discuss previous student project submissions. The culminating project, to be completed in a two week period between semesters, is an analysis and written report of one of three project choices made available each year to represent a spectrum of realistic applied statistical problems.

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<th>0101</th>
<th>Instructor: TBA</th>
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<td>Contact instructor or department for details.</td>
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**AMSC979**  
Master's Thesis Research  
Credits: 1-6  
Grading Method: Regular, Sat-Fail  

Contact department for information to register for this course.

**AMSC808A**  
Advanced Topics in Applied Mathematics  
Credits: 1-3  
Grading Method: Regular, Audit  

Advanced topics of current interest.

Contact department for information to register for this course.

**AMSC898**  
Pre-Candidacy Research
<table>
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<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>AMSC899</td>
<td>Doctoral Dissertation Research</td>
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