College of Arts & Sciences

The Department of Mathematics grants the M.A., M.S., and Ph.D. degrees. There are no specific course prerequisites for admission; however, two semesters of advanced calculus, and at least one semester each of algebra and topology are suggested. Both the M.A. and M.S. degrees are 30-credit-hour programs, offered under either Plan A or Plan B.

The Master of Arts degree, featuring a core program that emphasizes mathematical structures, is designed for prospective community college teachers and for students contemplating studies at the Ph.D. level. The Master of Science degree, through an emphasis on the applications of mathematics and the acquisition of computational skills, focuses on careers in business, industry, and government.

The doctorate is a research degree granted on the basis of broad mathematical knowledge and exhibited creative ability. Course work leading to the doctorate is available in the areas of algebra, analysis applied mathematics, discrete mathematics, numerical analysis, partial differential equations, and topology. Each student must pass three comprehensive examinations in one of the six areas of algebra, analysis, discrete mathematics, numerical analysis, partial differential equations, and topology.

Admission Requirements
The graduate programs in mathematics do not have formal admission requirements other than those of the Graduate School. Admission, however, is competitive. The admissions committee reviews transcripts, letters of recommendation, the candidate's personal statement, and GRE scores seeking evidence of mastery in proof-based mathematics (such as analysis, topology, and modern algebra), the ability to craft mathematical proofs, and general mathematical maturity.

Degree Requirements
In order to be admitted to candidacy for the Ph.D. degree, a student must complete studies in a minor field (either inside or outside the department) and successfully complete three comprehensive examinations as described above. Subsequent work becomes highly specialized through seminars, independent study, and finally, work on a dissertation is an original contribution to the candidate's major field. The faculty has research expertise in algebraic topology, coding theory, ring theory, algebraic geometry, number theory, complex variables, rational approximation, operator theory, partial differential equations, mathematical physics, continuum mechanics, numerical analysis, algebraic combinatorics, and optimization.

The ability to communicate mathematics is an increasingly important professional qualification. The department requires all students to complete a teaching or research assignment during each semester of their enrollment in a graduate mathematics program. Students will be assigned to teach courses at the early undergraduate level. With the approval of the Director of Graduate Studies, a student may substitute an equivalent research effort for the teaching activity.

Graduate Courses

| MA 415G | Graph Theory (Same As CS 415G) | (3) |
| MA 416G | Principles Of Operations Research I (Same As CS 416G) | (3) |
| MA 417G | Principles Of Operations Research II (Same As STA 417G) | (3) |
| MA 432G | Methods Of Applied Mathematics I | (3) |
| MA 433G | Introduction To Complex Variables | (3) |
| MA 471G | Advanced Calculus I | (3) |
MA 472G  Advanced Calculus II (3)
MA 481G  Differential Equations (3)
MA 483G  Introduction To Partial Differential Equations (3)
MA 485G  Fourier Series And Boundary Value Problems (Same As ME 585) (3)
MA 501  Seminar In Selected Topics (3)
MA 502  Seminar In Selected Topics (3)
MA 503  Combinatorics (3)
MA 506  Methods Of Theoretical Physics I (Same As PHY 506) (3)
MA 507  Methods Of Theoretical Physics II (Same As PHY 507) (3)
MA 515 Mathematical Programming And Extensions (Same As STA 515) (3)
MA 522  Matrix Theory And Numerical Linear Algebra I (Same As CS 522) (3)
MA 527  Applied Mathematics In The Natural Sciences I (Same As ME 527) (3)
MA 532  Ordinary Differential Equations (3)
MA 533  Partial Differential Equations (3)
MA 537  Numerical Analysis (Same As CS/EGR 537) (3)
MA 551  Topology I (3)
MA 561  Modern Algebra I (3)
MA 565  Linear Algebra (3)
MA 570  Multivariate Calculus (3)
MA 575  Principles Of Analysis (3)
MA 611 Independent Work In Mathematics (3-9)
MA 613  Problems Seminar In Operations Research (Same As EE/STA 619) (3)
MA 614  Ennumerative Combinatorics (3)
MA 616  Numerical Techniques For Nonlinear Optimization (3)
MA 617  Markovian Decision Problems (3)
MA 618  Combinatorics And Networks (3)
MA 622  Matrix Theory And Numerical Linear Algebra II (Same As CS 622) (3)
MA 625  Numerical Methods For Differential Equations (3)
MA 628  Applied Mathematics In The Natural Sciences II (3)
MA 630  Mathematical Foundations Of Stochastic Processes And Control Theory I (3)
MA 633  Theory Of Partial Differential Equations (3)
MA 641  Differential Geometry (3)
MA 651  Topology IS (3)
MA 654  Algebraic Topology I (3)
MA 655  Algebraic Topology II (3)
MA 661  Modern Algebra II (3)
MA 667  Group Theory (3)
MA 671  Functions Of A Complex Variable I (3)
MA 672  Functions Of A Complex Variable II (3)
MA 676  Analysis I (3)
MA 677  Analysis II (3)
MA 681  Functional Analysis I (3)
MA 682  Functional Analysis II (3)
MA 714  Topics In Discrete Mathematics (Subtitle Required) (3)
MA 715  Selected Topics In Optimization (3)
MA 721  Selected Topics In Numerical Analysis (3)
MA 732  Selected Topics In Differential And Integral Equations (3)
MA 748  Master's Thesis Research (0)
MA 749  Dissertation Research (0)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 751</td>
<td>Selected Topics In Topology</td>
<td>(3)</td>
</tr>
<tr>
<td>MA 752</td>
<td>Selected Topics In Topology</td>
<td>(3)</td>
</tr>
<tr>
<td>MA 761</td>
<td>Homological Algebra</td>
<td>(3)</td>
</tr>
<tr>
<td>MA 764</td>
<td>Selected Topics In Algebra</td>
<td>(3)</td>
</tr>
<tr>
<td>MA 765</td>
<td>Selected Topics In Algebra</td>
<td>(3)</td>
</tr>
<tr>
<td>MA 768</td>
<td>Residence Credit For Master's Degree</td>
<td>(1-6)</td>
</tr>
<tr>
<td>MA 767</td>
<td>Dissertation Residency Credit</td>
<td>(2)</td>
</tr>
<tr>
<td>MA 769</td>
<td>Residence Credit For Doctor's Degree</td>
<td>(0-12)</td>
</tr>
<tr>
<td>MA 772</td>
<td>Selected Topics In The Theory Of Complex Variables</td>
<td>(3)</td>
</tr>
<tr>
<td>MA 773</td>
<td>Selected Topics In Analysis</td>
<td>(3)</td>
</tr>
<tr>
<td>MA 777</td>
<td>Mathematical Seminar</td>
<td>(3)</td>
</tr>
<tr>
<td>MA 778</td>
<td>Mathematical Seminar</td>
<td>(3)</td>
</tr>
</tbody>
</table>