MATHEMATICS AND ECONOMICS

Web: http://www.emporia.edu/mathecon

Brian Hollenbeck, Chair
Chad Wiley, Graduate Coordinator

Graduate Faculty
Professors: Marvin Harrell, Brian Hollenbeck, Connie Schrock, Elizabeth Yanik, Joe Yanik.
Associate Professors: Essam Abotteen, Daniel Miller, Larry Scott, Qiang Shi, Chad Wiley.
Assistant Professors: Adelaide Akers, Rob Catlett, Thomas Mahoney, Rebekah Selby.

The graduate program in mathematics is designed to promote a high level of competence and understanding in the field of mathematics. The graduate course offerings are such that an individualized program may be designed emphasizing various areas of mathematics, mathematics education, statistics.

This program is beneficial to teachers in secondary schools and community colleges, persons interested in applying mathematics or statistics to problems in industry or government, and those preparing for further graduate study or research in these areas.

Admission Requirements
To be accepted in the graduate program in mathematics, a student must present work essentially equivalent to 20 hours of undergraduate mathematics, including at least two semesters of calculus and one course with a substantial focus on mathematical proofs, or gain consent of the graduate committee.

MS Degree, Mathematics
Students receiving the Master of Science degree in mathematics must have successfully completed MA 701 Mathematical Proofs and at least one course in each of the following areas:

Algebra

MA 727 Groups, Rings and Fields	3 hours
MA 728 Vector Spaces	3 hours
MA 740 Number Theory	3 hours
MA 741 Group Theory	3 hours
MA 742 Ring Theory	3 hours
MA 743 Field Theory	3 hours

Or any approved graduate level course in this area

Analysis

MA 715 Topology	3 hours
MA 734 Complex Variables	3 hours
MA 735 Advanced Calculus I	3 hours
MA 736 Advanced Calculus II	3 hours

Or any approved graduate level course in this area

Statistics and Applied Mathematics

MA 532 Mathematical Statistics I	3 hours
MA 581 Math Modeling	3 hours
MA 731 Statistics Using SAS	3 hours
MA 732 Categorical Data Analysis	3 hours
MA 733 Mathematical Statistics II	3 hours
MA 738 Applied Differential Equations	3 hours
MA 758 Wavelets	3 hours
MA 764 Regression Analysis	3 hours
MA 760 Numerical Analysis	3 hours
MA 762 Optimization Techniques	3 hours
MA 763 Simulation Techniques	3 hours
MA 765 Numerical Linear Algebra	3 hours

Or any approved graduate level course in this area

In addition, a minimum of six hours must be chosen from each of two of the three areas of algebra, analysis and statistics/applied math. No more than six hours of graduate work can be counted from outside the standard mathematics curriculum and this is subject to the approval of the graduate committee. Students in this degree program can select either a thesis option or a non-thesis option.

The Thesis Option
To fulfill the requirements for this option the student must complete 32 hours of acceptable graduate work including a thesis. The thesis will be worth either 3 or 5 credit hours, MA 850, Thesis Requirement.

The Non-Thesis Option
The student must take 34 hours of acceptable graduate work including at least one hour of MA 810, Seminar in Mathematics, which would involve the presentation of a seminar.

Written Examination
All students are required to take a written final examination to complete the program. The examination can be taken after 18 hours of graduate work, but no later than the fourth week of the final semester (or the second week if the final semester is a summer semester.) For the non-thesis option the examination will be over four graduate courses that the student has completed in the Department of

Mathematics, and Economics. Under the thesis option, in addition to a defense of the thesis, the student will also be required to take an examination over three courses. Under either option the student will select the courses for the examination, but the selection must include at least one course from each of the three areas of algebra, analysis, and statistics/applied mathematics and is subject to the approval of the Graduate Committee.

Certificate in Mathematics

This certificate is designed primarily for students who require 18 hours of graduate mathematics content in order to teach at the community college level or to teach dual-credit courses at the secondary level.

Course Requirements

MA 701 Mathematical Proofs	3 hours
*Any course in the algebra area	3 hours
**Any course in the analysis area	3 hours
*** Any course in the statistics and applied mathematics area	3 hours
Two additional graduate mathematics courses, which must be approved by the advisor and the Graduate Committee	6 hours
Total	**18 hours**

***Algebra courses include:**

MA 728 Vector Spaces	3 hours
MA 740 Number Theory	3 hours
MA 741 Group Theory	3 hours
MA 742 Ring Theory	3 hours
MA 743 Field Theory	3 hours

Special topic course approved by the graduate committee.

****Analysis courses include:**

MA 715 Topology	3 hours
MA 734 Complex Variables	3 hours
MA 735 Advanced Calculus I	3 hours
MA 736 Advanced Calculus II	3 hours

Special topic courses approved by the graduate committee

Statistics and Applied Mathematics

MA 532 Mathematical Statistics I	3 hours
MA 732 Categorical Data Analysis	3 hours
MA 733 Mathematical Statistics II	3 hours
MA 738 Applied Differential Equations	3 hours
MA 758 Wavelets	3 hours
MA 760 Numerical Analysis	3 hours
MA 762 Optimization Techniques	3 hours
MA 763 Simulation Techniques	3 hours
MA 764 Regression Analysis	3 hours
MA 765 Numerical Linear Algebra	3 hours

Special topic courses approved by the graduate committee