

## MATHEMATICS AND COMPUTER SCIENCE

Web: <http://www.emporia.edu/mathcsecon/home.htm>

Phone: 620-341-5281

**Larry Scott, Chair**

**Joe Yanik, Graduate Advisor**

### Graduate Faculty

Professors: Marvin Harrell, Chuck Pheatt, Connie Schrock, Elizabeth Yanik, Joe Yanik.

Associate Professors: Essam Abotteen, Brian Hollenbeck, Larry Scott, William Simpson.

Assistant Professors: Daniel Miller, Qiang Shi.

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, or computer science.

This program is beneficial to teachers in secondary schools and community colleges, persons interested in applying mathematics, statistics, or computer science 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 24-hours of undergraduate mathematics, including at least three semesters of calculus .

### MS Degree, Mathematics

Students receiving the Master of Science degree in mathematics must have successfully completed at least one course in each of the following areas:

<b>Algebra:</b>	<b>Hours</b>
MA 727      Groups, Rings and Fields.....	3
MA 728      Vector Spaces .....	3
MA 740      Number Theory.....	3
Or any approved graduate level algebra course	
<b>Analysis:</b>	
MA 734      Complex Variables.....	3
MA 735      Advanced Calculus I.....	3
MA 736      Advanced Calculus II.....	3
Or any approved graduate level analysis course	
<b>Statistics:</b>	
MA 532      Mathematical Statistics I.....	3
MA 733      Mathematical Statistics II .....	3
MA 764      Regression Analysis.....	3

Or any approved graduate level statistics course

**Geometry or Computer Science:**

MA 715	Topology .....	3
MA 721	Projective Geometry .....	3
MA 722	Non-Euclidean Geometry .....	3

Plus any graduate level computer science course.

In addition, at least six hours must be chosen from each of two of the three areas of algebra, analysis and statistics. No more than six hours of graduate work can be counted from outside the mathematical sciences 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.

**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 will be required to take a written examination. 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 Computer Science. 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 two of the three areas of algebra, analysis, and statistics.

**COURSES**

<b>COMPUTER SCIENCE</b>	<b>Hours</b>
CS 501. ADVANCED COMPUTER PROGRAMMING .....	1-3
CS 520. MICROCOMPUTER PROJECTS .....	3
CS 523. ARTIFICIAL INTELLIGENCE .....	3
CS 542. DISCRETE STRUCTURES .....	3
CS 545. DATABASE THEORY .....	3
CS 552. PRINCIPLES OF SOFTWARE ENGINEERING .....	3
CS 554. PRINCIPLES OF COMPUTER ARCHITECTURE .....	3
CS 555. PRINCIPLES OF COMPUTER ORGANIZATION .....	3
CS 557. OPERATING SYSTEMS .....	3
CS 561. SYSTEMS PROGRAMMING .....	3
CS 570. THEORY OF COMPUTATION .....	3
CS 580. INTRODUCTION TO COMPUTER NETWORKS .....	3

CS 584. RAPID APPLICATION DEVELOPMENT .....	3
CS 620. COMPUTER NETWORKS AND INTERNETS .....	3
CS 625. HTML PROGRAMMING .....	3
CS 760. NUMERICAL ANALYSIS .....	3
CS 762. OPTIMIZATION TECHNIQUES .....	3
CS 763. SIMULATION TECHNIQUES .....	3
CS 765. NUMERICAL LINEAR ALGEBRA .....	3
CS 775. COMPILER DESIGN .....	3
CS 780. FILE STRUCTURES .....	3
CS 810. SEMINAR IN COMPUTER SCIENCE .....	0-3

## **ECONOMICS**

### **Hours**

EC 501. HISTORY OF ECONOMIC THOUGHT .....	3
BC 550. INTERNATIONAL ECONOMICS .....	3
EC 554. PUBLIC FINANCE .....	3
EC 560. ECONOMIC DEVELOPMENT .....	3
EC 701. SEMINAR IN ECONOMICS .....	3
EC 705. ECONOMIC EDUCATION .....	1-6
EC 740. BUSINESS CYCLES AND FORECASTING .....	3
BC 807. MANAGERIAL ECONOMICS .....	2
BC 810. RESEARCH PROBLEM IN ECONOMICS .....	1-3

## **MATHEMATICS**

### **Hours**

MA 532. MATHEMATICAL STATISTICS I .....	3
MA 591. TOPICS IN MATHEMATICS .....	1-3
MA 592. TOPICS IN ELEMENTARY/MIDDLE SCHOOL MATHEMATICS .....	1-3
MA 715. TOPOLOGY .....	3
MA 721. PROJECTIVE GEOMETRY .....	3
MA 722. NON-EUCLIDEAN GEOMETRY .....	3
MA 727. GROUPS, RINGS AND FIELDS .....	3
MA 728. VECTOR SPACES .....	3
MA 733. MATHEMATICAL STATISTICS II .....	3
MA 734. COMPLEX VARIABLES .....	3
MA 735. ADVANCED CALCULUS I .....	3
MA 736. ADVANCED CALCULUS II .....	3
MA 740. NUMBER THEORY .....	3
MA 744. INTRODUCTION TO MATHEMATICAL LOGIC .....	3
MA 745. VECTOR ANALYSIS .....	3
MA 764. REGRESSION ANALYSIS .....	3
MA 791. TOPICS IN MATHEMATICS .....	1-3
MA 792. TOPICS IN ELEMENTARY/MIDDLE SCHOOL MATHEMATICS .....	1-3
MA 793. TOPICS IN SECONDARY SCHOOL MATHEMATICS .....	1-3
MA 810. SEMINAR IN MATHEMATICS .....	0-4
MA 820. DIFFERENTIAL GEOMETRY .....	3
MA 825. GROUP THEORY .....	3
MA 832. DIFFERENTIAL EQUATIONS II .....	3
MA 835. FUNCTIONS OF A REAL VARIABLE .....	3

MA 847. RESEARCH PROJECTS IN MATHEMATICS.....	1-5
MA 850. THESIS, MA, or MS .....	1-6
MA 955. CURRENT LITERATURE IN MATHEMATICS .....	0-3