

# MATHEMATICS

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## Faculty

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Lynelle M. Weldon

## Emeriti

Kenneth L. Franz  
Theodore R. Hatcher  
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Academic Programs	Credits
BS: Mathematics	39
BS: Mathematics Education	36
Major in Mathematical Studies	30
Minor in Mathematics	20
Minor in Mathematics Education	20
Minor in Mathematics of Economics and Finance	20

## Mission

Through teaching, research and service, the Department of Mathematics seeks to provide leadership in the mathematical sciences by preparing students with the mathematical understanding, problem-solving skills and dispositions that enable them to excel in their chosen careers; increasing mathematical and scientific knowledge through publication and presentation; supporting the broader mathematics education community; and mentoring others for generous service through a committed Christian life.

Mathematics is foundational to physics, engineering, and computer science, and is increasingly important in many fields of study such as finance, accounting, economics, biology, medicine, and environmental science. Students majoring in these and other fields will find that acquiring an additional major in mathematics or mathematical studies greatly enhances the marketability of their degree.

## Undergraduate

### BS: Mathematical (39)

MATH191 (or 195), 192, 215, 240, 286, 355; MATH 315 or 441; MATH389 or PHYS277 (4 semesters); STAT340 and at least 12 credits in additional courses chosen in consultation with a Department of Mathematics advisor from MATH271, 315, 405, 408, 426, 431, 432, 441, 442, 475, 487, 495. Students in a secondary teacher certification program are required to take MATH375, 475 and STAT285. (Note that MATH375 and STAT285 do not count

those obtaining elementary teacher certification. The minor listed above will also suffice for elementary certification.

**Minor in Mathematics Education (20 credit hours)**

MATH191 (or 195), 192, 215, 286, STAT285, 340. This minor is available only to students obtaining a degree in the School of Business Administration.

**Behavioral Neuroscience**

The Department of Mathematics is a participant in the Behavioral Neuroscience program funded by the National Science Foundation. For more details, see p. 115.

**Sequential Course Numbering**

All courses with more than one course number must be taken sequentially.

**Non-overlapping Credit Restrictions.** Because there is substantial overlap in material covered in the following groups of courses, no student is granted credit (other than general elective credit) in more than one course from each group:

1. MATH182, 191, 195 (Calculus with Applications, Calculus I, Calculus I for Biology)
2. MATH145, 166, 168 (Reasoning with Functions, Precalculus Algebra, Precalculus)

**Minimum grade for prerequisites, except for MATH191 and 195, is C-.**

**Mathematics Placement Examination (MPE).** See p. 48 for information on the MPE and the General Education Mathematics requirement. The MPE score is valid as a prerequisite for mathematics courses for 3 years after it is earned.

**Graduate Program**

**MS: Mathematics and Science**

The Department of Mathematics collaborates with the Departments of Biology, Chemistry, and Physics in this degree. See Mathematics and Science, p. 190.

**Course (Credit)**

See inside front cover for symbol code.

**Developmental Course**

MATH091 and MATH092 are provided for students not achieving a score of at least P2 on the Mathematics Placement Examination (MPE).

Students complete the sequence MATH091/092 by passing a set of proficiency tests in arithmetic and algebra, at which time a P2 score is awarded. When this occurs, the student has completed the Math Skill part of the General Education requirement, and is considered ready to take MATH 145, 166, 168, or STAT285. Depending on the diligence and previous preparation of the student, this may occur at any time in the MATH091/092 sequence.

**MATH091 S (3)**

Arithmetic and Algebra Review I  
Individualized review of arithmetic and algebra skills. Algebra topics include linear, quadratic and rational equations; graphs and systems of linear equations; and polynomial operations and factoring. Students completing the sequence requirements while enrolled in MATH091 are not required to take MATH092. This developmental course does not count toward college credit. Fall, Spring

**MATH092 S (3)**

Arithmetic and Algebra Review II  
Continuation of MATH091. Students not completing the sequence requirements but fulfilling attendance, participation, and progress requirements may receive an R grade requiring re-registration the next semester. This developmental course does not count toward college credit. Prerequisite: MATH091. Fall, Spring

**Undergraduate**

**MATH145 (3)**

Reasoning with Functions  
Functions given by tables, formulas, graphs, and words; inverse functions; linear, exponential, and other types of functions, such as quadratic, trigonometric, logarithmic, or power functions; rates of change and applications to science and business. Additional topics may be selected by the instructor. Fulfills the General Education Mathematics reasoning requirement. Prerequisite: MPE ≥ P2. Fall, Spring

**MATH165V C (3)**

College Algebra  
Paper correspondence course. A study of linear equations and inequalities; algebraic, logarithmic, and exponential functions; polynomials and complex numbers. Includes applications in business and science. Fulfills the General Education Mathematics reasoning requirement. Prerequisite: MPE ≥ P2.

**MATH166 (3)**

Precalculus Algebra  
Equations and inequalities; systems of linear equations; algebraic, polynomial, rational, exponential, and logarithmic functions; inverse functions, complex numbers, applications, and selected topics. Fulfills the General Education Mathematics reasoning requirement. Prerequisite: MPE ≥ P2. Fall, Spring

**MATH167 Alt (2)**

Precalculus Trigonometry  
Trigonometric functions and their inverses, identities, trigonometric equations; laws of sines and cosines, vectors, applications, and selected topics. Fulfills the General Education Mathematics reasoning requirement. Prerequisite: MPE ≥ P3 or MATH166 or MATH145. Fall, even years

**MATH168 (4)**

Precalculus  
Covers most of the content of MATH166 and MATH167. Equations and inequalities; systems of linear equations; algebraic, polynomial, rational, exponential, and logarithmic functions; inverse functions, complex numbers, trigonometric functions and their inverses, identities, trigonometric equations, laws of sines and cosines, vectors, applications, and selected topics. Fulfills the General Education Mathematics reasoning requirement. Prerequisite: MPE ≥ P2. Fall, Spring

**MATH168V**

**C (4)**

Precalculus

Paper correspondence course—see content above. Fulfills the General Education Mathematics reasoning requirement.

Prerequisite: MPE  $\geq$  P2.

**MATH182**

**Alt (3)**

Calculus with Applications

Introduction to single-variable calculus, including limits, differentiation, optimization, and integration with applications to problems in business and the social sciences. Some topics from multivariable calculus, including partial derivatives and extrema of functions of

**MATH426**

**t Alt (3)**

Mathematical Modeling in Biology

Theory and application of linear and nonlinear mathematical

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investigations. The pedagogy of the course models that of effective middle school mathematics teachers.

**MAED521** (2)  
Informal Geometry and Measurement for Middle Grades Educators

This course is the first of two which lead prospective mathematics teachers through a series of explorations to develop competence in geometric reasoning, including conjecture, proving, and disproving. Prospective teachers develop a deeper understanding of the role of proof in geometry. The pedagogy of this course models that of effective middle school mathematics teachers.

**MAED522** (2)  
Formal Geometry for Middle Grades Educators

This course is the second of two which lead prospective mathematics teachers through a series of explorations to develop competence in geometric reasoning, including conjecturing, proving, and disproving. Prospective teachers refine their understanding of the role of proof in geometry. The pedagogy of the course models that of effective middle school mathematics teachers.

**MAED600** (2)  
Discrete Mathematics and Number Theory for Middle Grades Educators

Students investigate concepts of number theory, discrete mathematics, and logic as they apply to middle grades mathematical education. Each topic includes a study of graphic representation of concepts and applications in technology. The pedagogy of the course models that of effective middle school mathematics teachers.

**MAED610** (4)  
Mathematical Modeling for Middle Grades Educators  
Investigation of concepts and practices of mathematical modeling with an emphasis on application to middle grades education. The pedagogy of the course models that of effective middle school mathematics teachers.

**MAED625** (2)  
Mathematical Investigations for Middle Grades Classrooms  
Participants investigate topics in mathematics, including probability, programming, fractals, and chaos theory. Emphasis is placed on participant understanding of these topics and their appropriate use as investigations with middle grades students. The pedagogy of the course models that of effective middle school mathematics teachers.

**MAED 630** (1-4)  
Seminar: \_\_\_\_\_  
Seminar in specific topics relevant to mathematics education. Each seminar examines one topic in detail. Repeatable with different topics. May be graded S/U.

## MATHEMATICS & SCIENCE

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### Faculty

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David A. Steen, Biology  
Tiffany Z. Summerscales, Physics  
Stephen C. Thorman, Physics, Computer Science  
Lynelle M. Weldon, Mathematics  
Robert E. Zdor, Biology

### Mi i

Inspire and equip students to celebrate learning, sense the action of God in the Universe, extend their analytical skills and knowledge base in mathematics and science, and identify and seek solutions to scientific issues.

### MS:Ma he a ic a d Scie ce

The Master of Science: Mathematics and Science is designed for students who wish to acquire a breadth of knowledge which cannot be achieved within any one discipline among mathematics, biology, chemistry and physics. Such a degree may be useful for secondary or middle-school teachers who teach mathematics and science subjects, but who do not desire a traditional MAT program; for those who wish to develop skills in areas of overlap in these disciplines; for those who wish to study the interrelationships among the disciplines; and for those who wish further preparation for careers in industry or government.

In addition to the general requirements for admission to and enrollment in graduate degree programs outlined in this bulletin, students must meet departmental requirements.

### Ad i i Re i e e

- A bachelor's degree with a major in Mathematics, Biology, Chemistry, or Physics, and a minimum GPA of 3.00 (B) in mathematics and science courses.
- Completed the GRE General Exam for admission to regular