

Read g/Ge a
 For students without a working knowledge in German; an introduction to the grammar and syntax of German for the purpose of translating written German into English. May count toward a general elective only.

T c
 A study of selected topics in language, literature, or civilization. Topics and credits to be announced. Repeatable with different topics.

D ec ed S /Read g/Re ea c /P ec
 Studies in the area of French/Spanish language, literature, or civilization, as determined in consultation with the instructor.

MATHEMATICS

Haughey Hall, Room 121
 269-471-3423
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Robert C. Moore, *Chair*

BS: Mathematics	39
Applied Mathematics	
Preparation for Secondary School Mathematics Teaching	
Preparation for Graduate Study in Mathematics	
BS: Mathematics Education	30
Major in Mathematical Studies	30
Minor in Mathematics	20
Minor in Mathematics Education	20
Minor in Mathematics of Economics and Finance	20

M
 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.

U n d e r g r a d u a t e M a t h e m a t i c s

BS: Mathematics (39)

MATH141, 142, 215, 240, 286, 355; MATH 315 or 441; STAT340 and at least 12 credits in additional courses chosen in consultation with a Mathematics Department advisor from MATH271, 315, 389, 405, 408, 426, 431, 432, 441, 442, 475, 487, 495, CPTR436. Students in a teacher certification program are required to take MATH475 and STAT285. (Note that STAT285 does not count toward the 39 major credits.) A major field test in mathematics is required during the senior year.

CPTR125

Major in Mathematics (30)

MATH141, 142, 215, 240 and at least 15 credits in additional courses chosen in consultation with a Mathematics Department advisor from STAT340, CPTR125, MATH271, 286, 315, 355, 389, 405, 408, 426, 431, 432, 441, 442, 475, 487, 495, CPTR436. A major field test in mathematics is required during the senior year. This major is available only as a second major, to those taking a major in another field.

Minor in Mathematics (20)

MATH141, 142, 215 and at least 9 credits in additional courses chosen in consultation with a departmental advisor from MATH240, 286, 315, 355, 389, 405, 408, 426, 431, 432, 441, 442, 475, 487, 495; STAT340, CPTR436. Students in a teacher certification program are required to take MATH355, 475, STAT285, 340. (Note that STAT285 does not count toward the 20 minor credits.)

BS: Mathematics Education (30)

MATH141, 142, 215, 240, 355, 475; STAT285, 340 and one additional course chosen in consultation with a Mathematics Department advisor from MATH286, 426. This major is available only to those who are obtaining elementary or secondary teacher certification. A major field test in mathematics is required during the senior year.

CPTR125

Minor in Mathematics Education (20)

MATH145, 167, 182, 215, 220, 355, STAT285. This minor is available only to those obtaining elementary teacher certification. The regular minor listed above will also suffice for elementary certification.

Minor in Mathematics Education (20)

MATH141, 142, 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. 121.

Senior Research Paper/Thesis

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

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. MATH141, 182 (Calculus I, Calculus with Applications)
2. MATH145, 166, 168 (Reasoning with Functions, Precalculus Algebra, Precalculus)

See p. 39 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 Programs

MS: Mathematics

The Department of Mathematics collaborates with the Departments of Biology, Chemistry, and Physics in this degree. See Mathematics and Science, p. 171.

The Department of Mathematics collaborates with the School of Education and the Berrien County Intermediate School District to administer the Alternative Certification Experimental Program (Math Endorsement Program) for Middle School Educators. Applications to this Program are initially screened by the School of Education and the Department of Mathematics, and then go through the regular Andrews admissions process. Courses are listed below under "Mathematics Education." Inquiries should be directed to Larry Burton 269-471-3465, burton@andrews.edu; Lynelle Weldon 269-471-3866, weldon@andrews.edu; or Judy Wheeler 269-471-7725 ext. 302, jwheele@remc11.k12.mi.us.

Course Symbols (C)

See inside front cover for symbol code.

Diploma in Calculus

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.

Advanced Algebra Review (A)

Advanced Algebra Review I

Individualized review of arithmetic and algebra skills. Provides computer-generated drill problems, instant scoring and explanation, with conceptual instruction as required. Students

completing the sequence requirements while enrolled in MATH091
are not required to take MATH092. *Fall, Spring*

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Math 355

Math 355

Linear Algebra

Vector spaces, eigenspaces, linear transformations, orthogonality, inner product spaces, quadratic forms, and selected topics.

Prerequisites: MATH215, 355. *Spring*

Math 355

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Discrete Mathematics

Selected topics in discrete mathematics, including logic, set theory, relations, functions, properties of integers, modular arithmetic, and RSA encryption. Mathematical reasoning and the writing of proofs will be emphasized. Prerequisites: MATH141 or

Mathematics Education

The Department of Mathematics collaborates with the School of Education and the Berrien County Intermediate School District to offer these courses when funding is available. The type of funding may place restrictions on enrollment in these courses. Inquiries should be directed to one of the following individuals:
Larry Burton 269-471-3465, burton@andrews.edu
Lynelle Weldon 269-471-3866, weldon@andrews.edu
Judy Wheeler 269-471-7725, ext.302, jwheele@remc11.k12.mi.us

Advanced Algebra (3)

U de a d g N be a d O. e a f M d d e G a d e Ed ca

This course is designed to strengthen middle school teachers' rational number knowledge and number sense. This includes the in-depth study of rational numbers and operations on rational numbers, the structure of the rational and real number systems, algorithms for computation, estimation strategies, and working with very large and very small numbers. The pedagogy of the course models that of effective middle school mathematics teachers.

Advanced Geometry (3)

E g A g e b a a d F c f M d d e G a d e Ed ca

This course extends the middle school teachers' understanding of algebra as a symbolic language. This course moves beyond symbol manipulation to include modeling of physical situations. Students will explore algebraic, linear, and non-linear functions within the context of the course. The pedagogy of the course models that of effective middle school mathematics teachers.

Data Analysis (3)

D a a A a f M d d e G a d e Ed ca

This course presents an integrated approach to data analysis, statistics, and probability for middle grades math teachers. Instruction focuses on specific real-world data sets and statistical investigations. The pedagogy of the course models that of effective middle school mathematics teachers.

First Course in Geometry (3)

I f a G e e a d M e a e e f M d d e G a d e Ed ca

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.

Second Course in Geometry (3)

F a G e e f M d d e G a d e Ed ca

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

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