
Mathematics (M.Ed.)

Academic Unit Head

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Professors

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[Print Version of Catalog](#)



Mathematics

Admission Criteria

Prerequisites

Students should have completed undergraduate mathematics (15 credits or more) including linear algebra and a calculus sequence. An undergraduate major in mathematics is desirable, but not necessary.

To Apply

Prospective students should visit [The Graduate School](#) website, where they will find links with information about the application process, as well as an online application.

For questions about program entrance requirements, please contact [Anthony Tongen](#), the mathematics graduate program director.

Mission

The Master of Education (M. Ed.) in mathematics prepares high school teachers for positions of instructional leadership as master teachers of mathematics. The program extends the professional competence of high school mathematics teachers through an in-depth study of mathematics and mathematics teaching and learning. Program participants will demonstrate their knowledge through an innovative, completely online curriculum.

The M. Ed. in mathematics is a collaborative effort of the [College of Education](#) and the [Department of Mathematics and Statistics](#) that is designed to provide opportunities for mathematics teachers to deepen their understanding of mathematics by learning advanced mathematical topics in relation to the mathematics they actually teach. The program will also help prepare teachers to teach advanced secondary mathematics courses, such as Advanced Placement calculus or statistics. The education courses will provide opportunities for teachers to better understand technologies for learning and how to continue to develop as a professional educator. The M. Ed. is designed to develop teachers' understanding of and ability to apply education research within their own practice. The M. Ed. content is consistent with the recommendations of the Mathematical Education of Teachers' report of the Conference Board of the Mathematical Sciences.

Master of Education in Mathematics

The Master of Education in mathematics includes a minimum of 34 credit hours of course work, which are organized with 13 hours of educational development and 21 hours of mathematics.

All course work for this program is offered online.

Degree Requirements

Course Requirements

	Credit Hours
EDUC 630 . Inquiry in Education	3
EDUC 631 . Seminar in Educational Inquiry	1
EDUC 641 . Learning Theories and Instructional Models	3
EDUC 642 . Curriculum Theory and Issues	3
LTLE 570 . Design and Development of Digital Media	3
MATH 510 . Modern Analysis	3
MATH 512 . Discrete Mathematics	3
MATH 514 . Modern Algebra	3
MATH 520 . Modern Geometry	3
MATH 615 . History of Mathematics	3
MATH 617 . Probability and Statistics I	3
MATH 618 . Probability and Statistics II	3

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Course Offerings

Mathematics

MATH 510. Modern Analysis. 3 credits.

A course to update and broaden secondary teachers' capability and point-of-view with respect to topics in analysis. Applications of concepts such as limits, continuity, differentiation and integration. May be taken for graduate credit and for certificate renewal by secondary school teachers. *Prerequisite: Undergraduate analysis or permission of instructor.*

MATH 512. Discrete Mathematics. 3 credits.

A course to update and broaden secondary teachers' capability and point-of-view with respect to topics in discrete mathematics. May be taken for graduate credit for certificate renewal by secondary school teachers. *Prerequisite: Undergraduate mathematics through linear algebra.*

MATH 514. Modern Algebra. 3 credits.

From an advanced viewpoint, an investigation of topics in algebra from high school curriculum. Theory of equations, polynomial rings, rational functions and elementary number theory. Course may be taken for graduate credit and for certificate renewal by secondary school teachers. *Prerequisite: Undergraduate algebra or permission of instructor.*

MATH 520. Modern Geometry. 3 credits.

Topics in geometry of concern to secondary teachers in their work and provision for background and enrichment. Various approaches to study of geometry, including vector geometry, transformational geometry and axiomatics. Course may be taken for graduate credit and for certificate renewal by secondary teachers. *Prerequisite: Undergraduate mathematics through linear algebra or undergraduate geometry.*

MATH 522. Statistics for Researchers. 3 credits.

Introduction to statistics and statistical methods, including descriptive techniques, tests of hypotheses, confidence intervals, regression, analysis of variance, nonparametric procedures and the use of SPSS. Data models include one and two-sample comparison of means, repeated measures, comparison of proportions, Chi-square test of independence, McNemar test, simple linear and logistic regression.

MATH 615. History of Mathematics. 3 credits.

Topics in the history of mathematics of particular concern to secondary teachers in their work and provision for background and enrichment. Selected topics spanning ancient times to the present. Course may be taken for graduate credit and for certificate renewal by secondary teachers.

MATH 617. Probability and Statistics I. 3 credits.

AP probability and statistics topics sampling, experimentation, and anticipating patterns. These include Bayes's theorem; binomial, geometric, uniform, normal, t, and Chi-square random variables and the mean and variance of linear combinations of random variables. Sampling distributions and central limit theorem, unbiased point estimates of population parameters and the variance of point estimates. Types of generalizations and conclusions that can be drawn including cause-and-effect. Course may be taken for graduate credit and for certificate renewal by secondary teachers.

MATH 618. Probability and Statistics II. 3 credits.

AP statistics topics exploring data and statistical inference. Correlation and simple linear regression, interpretation of residual plots, influential points, and transformations. Logic of significance testing including hypotheses, errors, p-values, and power. Statistical inference methods (confidence intervals, significance tests, and the relationship between one- and two-side tests and confidence intervals) for proportions and means, the slope of a regression line, and the Chi-Square tests. Course may be taken for graduate credit and for certificate renewal by secondary teachers. *Prerequisite:* [MATH 617](#) or permission of instructor.

MATH 685. Selected Topics II. 3 credits.

An in-depth study of selected topics not otherwise covered in the regular offerings of the department. May be repeated for credit when course content changes. Course may be taken for graduate credit and for certificate renewal by secondary teachers.