

# Mathematics Teaching (MTHT)

## Courses

### MTHT 400. Methods of Teaching Secondary Mathematics I. 3 or 4 hours.

Teacher preparation with a focus on mathematics education research including analysis of students' thinking using records of practice in the form of case studies both on video and paper. Course Information: 3 undergraduate hours. 4 graduate hours. To be taken in the year prior to student teaching. Prerequisite(s): Grade of C or better in MATH 215; or consent of the instructor Enrollment in B.S. or M.S. in the Teaching of Mathematics program in Secondary Mathematics Education, and a 2.50 grade point average in mathematics courses at the level of calculus or above. Student must be admitted to candidacy.

### MTHT 401. Methods of Teaching Secondary Mathematics II. 3 or 4 hours.

Secondary teacher preparation with focus on practice of teaching and responsibilities of instructional leader based on the Professional Teaching Standards, current research, and best practice. Course Information: 3 undergraduate hours. 4 graduate hours. 20 hours observation in secondary mathematics classes. To be taken in year prior to student teaching. Prerequisite(s): Grade of C or better in MATH 210; Enrollment in the B.S. or M.S. in the Teaching of Mathematics program in Secondary Mathematics Education; and a 2.50 grade point average in mathematics courses at the level of calculus or above. Student must be admitted to candidacy.

### MTHT 411. Advanced Euclidean Geometry. 3 or 4 hours.

Axioms for Euclidean geometry are developed based upon reflections. Further concepts in Euclidean geometry which arise from these axioms are explored. Course Information: 3 undergraduate hours. 4 graduate hours. Prerequisite(s): Grade of C or better in MATH 215.

### MTHT 420. Computers in Secondary School Mathematics. 3 or 4 hours.

An overview of techniques, topics and tools for teaching secondary level mathematics using computers. Course Information: 3 undergraduate hours. 4 graduate hours. Prerequisite(s): Grade of C or better in MATH 210.

### MTHT 430. Real Analysis for Teachers I. 3 or 4 hours.

Major topics include real number system with emphasis on the completeness axiom, limits of sequences and functions, derivatives, Riemann integrals and the Fundamental Theorem of Calculus. Course Information: 3 undergraduate hours. 4 graduate hours. Prerequisite(s): Grade of C or better in MATH 210 and Grade of C or better in MATH 215.

### MTHT 435. Abstract Algebra. 3 or 4 hours.

Sets, properties of integers, groups, rings, fields. Focus on concepts applicable to high school teaching. Course Information: 3 undergraduate hours. 4 graduate hours. Prerequisite(s): MATH 210 and MATH 215.

### MTHT 438. Educational Practice with Seminar I. 6 hours.

The first half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Course Information: Graduate credit only with approval of the department. Prerequisite(s): 2.50 grade point average in mathematics courses at the level of calculus or above, successful completion of 100 clock hours of pre-student-teaching field experiences, and approval of the department. Class Schedule Information: To be properly registered, students must enroll in one Lecture-Discussion and one Practice.

### MTHT 439. Educational Practice with Seminar II. 6 hours.

The second half of a two-segment sequence of practice teaching, including seminar, to meet certification requirements for teaching in grades six through twelve. Course Information: Graduate credit only with approval of the department. Prerequisite(s): Credit or concurrent registration in MTHT 438; and approval of the department and a 2.50 grade point average in mathematics courses at the level of calculus or above and successful completion of 100 clock hours of pre-student teaching field experiences. Class Schedule Information: To be properly registered, students must enroll in one Conference and one Practice.

### MTHT 450. Concepts and Methods in Elementary and Middle School Mathematics I. 3 or 4 hours.

Emphasizes the methods of teaching elementary and middle school mathematics in the context of investigating patterns, functions, number theory, and proportional reasoning. Course Information: 3 undergraduate hours. 4 graduate hours. For elementary and middle school teachers.

### MTHT 465. Teaching Algebra for Understanding. 3 or 4 hours.

Manipulatives and other representations of mathematical concepts used for teaching algebra to middle grade students. Course Information: 3 undergraduate hours. 4 graduate hours. Prerequisite(s): Admission to the M.S. in the Teaching of Mathematics program (Option for Elementary School Teachers) or consent of the instructor.

### MTHT 466. Introduction to Calculus and the Graphing Calculator. 4 hours.

Problem solving using derivatives, differentials, and their applications followed by integrals and their applications. Maximum/minimum problems solved directly by graphing, then by derivatives. Course Information: Prerequisite(s): Admission to the Mathematics Education Concentrators Program or consent of the instructor.

### MTHT 467. Introduction to Number Theory with Application. 4 hours.

Classical topics of elementary number theory and how they pertain to teaching the upper grades. Primes, GCF, LCM, divisibility, floor and ceiling functions, Gaussian Residue, lattices. Course Information: Prerequisite(s): Admission to the Mathematics Education Concentrators Program or consent of the instructor.

### MTHT 468. Geometry with Applications for Middle Grade Teachers. 4 hours.

Plane and solid figures and their properties. Polygons and polyhedra. Euler's formula. Volume versus surface area. Spatial visualization; two dimensional representations of three dimensional figures. Course Information: Prerequisite(s): Admission to the Mathematics Education Concentrators Program or consent of the instructor.

### MTHT 470. Teaching Mathematics with Science: An Activity Approach I. 3 or 4 hours.

Introduction to basic variables (length, area, volume, mass, time) and the Scientific Method (picture, table, graph, questions). Extensive use of TIMS project curriculum. Course Information: 3 undergraduate hours. 4 graduate hours. For elementary school teachers. Prerequisite(s): Admission to the M.S. in the Teaching of Mathematics program (Option for Elementary School Teachers) or consent of the instructor.

**MTHT 490. Topics in Teaching Secondary Mathematics. 1-5 hours.**

Course content is announced prior to each term in which it is given.

Course Information: May be repeated. Students may register in more than one section per term. Prerequisite(s): Prerequisites may vary according to topic.

**MTHT 491. Topics in Teaching Elementary/Junior High School Mathematics. 1-5 hours.**

Course content is announced prior to each term in which it is given.

Course Information: May be repeated. Students may register in more than one section per term. Prerequisite(s): Prerequisites may vary according to topic.

**MTHT 496. Independent Study. 1-4 hours.**

Reading course supervised by a faculty member. Course Information:

May be repeated. Students may register in more than one section per term. Prerequisite(s): Approval of the instructor and the department.

Class Schedule Information: This course counts toward the limited number of independent study hours accepted toward the degree and the major.

**MTHT 510. Introduction to Higher Geometry. 4 hours.**

Projective geometry, as an extension of Euclidean geometry, treated synthetically and/or algebraically. Desargues' and Pappus' theorems, subgeometries, conics and the underlying skew field. Course Information: For graduate students in mathematics teacher education programs. Other students enroll in MATH 440. Prerequisite(s): Grade of C or better in MATH 330.

**MTHT 530. Mathematical Analysis for Teachers II. 4 hours.**

Derivatives, inverse functions, Riemann integral, trigonometric functions, logarithmic and exponential functions. Course Information: Prerequisite(s): Grade of C or better in MTHT 430 or consent of the instructor.

**MTHT 550. Concepts and Methods in Elementary and Middle School Mathematics II. 4 hours.**

Methods of teaching middle school mathematics: concept development; focus on classroom materials to promote learning. Area, volume, rational numbers, decimals, function machines. Course Information: Prerequisite(s): MTHT 450 or consent of the instructor.

**MTHT 560. Introduction to Analytic Geometry and Calculus. 4 hours.**

Programmable calculators used to investigate ideas and applications of analytic geometry, differential and integral calculus. Examples and ideas relevant to elementary mathematics and science curricula. Course Information: For elementary school teachers. Do not purchase a calculator until after the first day of class. Prerequisite(s): MTHT 460 or consent of the instructor.

**MTHT 565. Teaching Geometry: An Activity Approach. 4 hours.**

Informal geometry using manipulatives, elementary topological concepts, polygons, polyhedra, metric geometry, motion geometry, geometric constructions, spherical geometry, introduction to research on the learning of geometry. Course Information: For elementary school teachers. Prerequisite(s): Enrollment in the M.S. in the Teaching of Mathematics program (Option for Elementary School Teachers) or consent of the instructor.

**MTHT 575. Principles of Probability and Statistics. 4 hours.**

Probability, descriptive and inferential statistics, implications for teaching. Emphasis on collection and analysis of data, classroom activities and software. Course Information: For elementary school teachers. Prerequisite(s): Admission to the M.S. in the Teaching of Mathematics program (Option for Elementary School Teachers) or approval of the department.

**MTHT 589. Practicum in Teaching Elementary School Mathematics. 4 hours.**

Culminating experience for students in the M.S. in the Teaching of Mathematics (Option for Elementary School Teachers). Major project is required. Supervised weekly seminars. Course Information: Prerequisite(s): Admission to the M.S. in the Teaching of Mathematics program (Option for Elementary School Teachers) and consent of the instructor.

**MTHT 590. Topics in Teaching Secondary Mathematics. 1-5 hours.**

Course content is announced prior to each term in which it is given.

Course Information: May be repeated. Students may register in more than one section per term. Prerequisite(s): Prerequisite may vary according to topic.

**MTHT 591. Topics in Teaching Elementary/Junior High School Mathematics. 1-5 hours.**

Course content is announced prior to each term in which it is given.

Course Information: May be repeated. Students may register in more than one section per term. Prerequisite(s): Prerequisite may vary according to topic.

**MTHT 592. Topics in Advanced Mathematics for Teachers. 1-5 hours.**

Course content is announced prior to each term in which it is given.

Course Information: May be repeated. Students may register in more than one section per term. For students in the M.S. in the Teaching of Mathematics program. Prerequisite(s): Prerequisite may vary according to topic.

**MTHT 596. Independent Study. 1-4 hours.**

Reading course supervised by a faculty member. Course Information: May be repeated. Students may register in more than one section per term. Prerequisite(s): Approval of the instructor and the department.