

# MATHEMATICS (MATH)

## **MATH 094. Mathematics Concepts for Elementary Teachers 1. (1 Credit)**

This course is part of a series of individualized courses designed to enable pre-service Early Childhood and Middle Childhood through Early Adolescence teachers build their mathematics content knowledge. Students will gain a stronger understanding of foundational mathematics concepts and gain procedural proficiency. In addition, students will enhance their written and verbal mathematics communication skills.

## **MATH 095. Mathematics Concepts for Elementary Teachers 2. (1 Credit)**

This course is part of a series of individualized courses designed to enable pre-service Early Childhood and Middle Childhood through Early Adolescence teachers build their mathematics content knowledge. Students will gain a stronger understanding of foundational mathematics concepts and gain procedural proficiency. In addition, students will enhance their written and verbal mathematics communication skills.

## **MATH 096. Mathematics Concepts for Elementary Teachers 3. (1 Credit)**

This course is part of a series of individualized courses designed to enable pre-service Early Childhood and Middle Childhood through Early Adolescence teachers build their mathematics content knowledge. Students will gain a stronger understanding of foundational mathematics concepts and gain procedural proficiency. In addition, students will enhance their written and verbal mathematics communication skills.

## **MATH 119. Number Sense: Teaching Pre K-9. (3 Credits)**

This course is the first course in a two-course sequence that presents an integrated approach to mathematics content and methods appropriate for early childhood, elementary, and middle school pre-service teachers. Emphasis is on constructing knowledge through problem solving, communication, reasoning, connecting mathematical ideas, representation, and generalization. Pre-service teachers will develop their conceptual understanding of “number”. Specific number sense topics include numeration systems, number theory, concepts of numbers and operations (whole numbers, integers, fractions, decimals, percents, and ratios), estimation, and proportional reasoning. Preservice teachers will invent strategies to solve computations.

## **MATH 120. Data & Space: Teaching Pre K-9. (3 Credits)**

This course is the second course in a two-course sequence that presents an integrated approach to mathematics content and methods appropriate for early childhood, elementary, and middle school pre-service teachers. Emphasis is on constructing knowledge through problem solving, communication, reasoning, connecting mathematical ideas, representation, and generalization. Pre-service teachers will develop their conceptual understanding of “uncertainty” and “geometry”. Topics include collecting, representing and analyzing data; concepts of chance; strategies for determining probability of events; functions; properties of 2-D and 3-D figures; transformations, similarity and symmetries; measurement systems; perimeter, area, volume, and surface area; and topology.

Prerequisite: MATH 119\*.

\* May be taken concurrently.

## **MATH 121. Intermediate Algebra. (3 Credits)**

This course continues the study of algebra combining previously acquired algebraic knowledge with new topics. Content includes: real numbers, exponents, polynomials, linear equations, quadratic equations, systems of equations, functions, graphing, rational expressions, and determinants.

## **MATH 125. Contemporary Math. (3 Credits)**

This course presents problem solving, structure and properties of the real number systems, number theory, principles of descriptive and inferential statistics, probability and geometry topics. Emphasis is on application to real life situations.

## **MATH 128. College Algebra. (3 Credits)**

This course presents linear, quadratic, polynomial, exponential and logarithmic functions and their graphs, asymptotes and end-behavior of functions, inverse functions, systems of equations, and applications of these.

## **MATH 130. Basics of Statistics. (3 Credits)**

This course studies the basic methods of sampling and interpreting data probability, the normal distribution, correlation, hypothesis testing and confidence intervals. Recommended three years of high school college preparatory mathematics or MATH 121. For BSN Completion students only.

## **MATH 150. Trigonometry. (3 Credits)**

This course provides the essential elements of trigonometry, particularly emphasizing the trigonometric functions. Recommended two years of high school college preparatory algebra and one year of geometry or MATH 121.

## **MATH 197. Applied Calculus. (3 Credits)**

This course presents the basic concepts of differential and integral calculus including limits, continuity, differentiation, and integration of real-valued functions. Applications are chosen from business, life sciences, and social sciences. Recommended 4 years of high school college preparatory mathematics or MATH 128.

Prerequisite: MATH 128.

## **MATH 201. Calculus I. (4 Credits)**

This course presents limits, continuity, and differentiation of real valued functions as well as their applications. Integration of functions and their applications are also discussed. Recommended four years of high school mathematics or MATH 128 and MATH 150.

Prerequisite: MATH 128.

## **MATH 202. Calculus II. (4 Credits)**

This course presents analytic geometry, integration and differentiation of trigonometric, exponential, and logarithmic functions. Techniques of integration, improper integrals, parametric equations, and differential equations are also discussed. Sequences and series are also introduced.

Prerequisite: MATH 201.

## **MATH 203. Calculus III. (4 Credits)**

This course presents vectors, vector-valued functions, partial derivatives, and multiple integration with applications. An introduction to vector calculus is also presented including vector fields, line integrals, and surface integrals.

Prerequisite: MATH 202.

## **MATH 205. Statistics I. (3 Credits)**

This course presents the basic methods of sampling and interpreting data, probability, the normal distribution, correlation, hypothesis testing and confidence intervals.

## **MATH 220. Discrete Math. (3 Credits)**

This course presents the topics of sets, proof, boolean algebra, logic, induction, combinatorics, graph theory, functions, and algorithms.

Prerequisites: (MATH 201 or 197).

**MATH 305. Statistics II. (3 Credits)**

This course is designed to continue the student's background in probability and statistics. Students examine ANOVA, two sample tests, regression and multiple regression, non-parametric statistics, and the Chi-square distribution.

Prerequisite: MATH 205.

**MATH 313. Math in the Middle School. (3 Credits)**

This course investigates methods and content appropriate for teaching mathematics to middle school students using the Common Core State Standards, Standards for Mathematical Practice Standards, and Content Standards, as a framework. Emphasis is placed on the application of mathematics in the STEM areas (science, technology, and engineering). Additionally, it provides real-world lesson planning and teaching experience.

**MATH 321. Abstract Algebra. (3 Credits)**

This course is a study of sets, mappings, operations, relations, partitions, and the basic algebraic structures; groups, rings, integral domains, fields, and vector spaces. Strongly recommended for those in secondary mathematics.

Prerequisite: MATH 202.

**MATH 325. Linear Algebra and Differential Equations. (4 Credits)**

This course presents elementary linear algebra, including matrices and determinants, vector spaces, linear transformations, solutions of linear systems, and differential equations including series of equations.

Prerequisite: MATH 203.

**MATH 331. Geometry. (3 Credits)**

This course is a study of postulational development of Euclidean and non-Euclidean geometries.

Prerequisite: MATH 202.

**MATH 441. Real Analysis. (3 Credits)**

This course presents differentiation and convergence in a real  $n$ -space; topology of the real line and metric spaces; theory of the integral; and uniform convergence.

Prerequisite: MATH 203.

**MATH 461. Probability & Statistics. (3 Credits)**

Basic probability theory; random variables, single, joint, conditional and marginal probability distributions; expectation, variance, covariance and other moments and other moment generating functions.

**MATH 490. Math Senior Seminar. (3 Credits)**

This course is the culminating undergraduate experience in mathematics. It provides an opportunity for the student to work with a specific topic from the spectrum of mathematical knowledge. An individual research project will be required. Senior standing and at least 24 credits in mathematics courses.

**MATH 495. Mathematics Education Senior Seminar. (3 Credits)**

This course is the culminating undergraduate experience in the accelerated mathematics education program. It provides an opportunity for the student to work with a specific topic from the spectrum of mathematics education knowledge. An individual research project will be required. Note: A student must have completed 24 credits of mathematics coursework prior to taking this class.