Content Courses for Secondary Mathematics Teaching

Overview of courses:

The content courses are designed to develop two broad kinds of mathematical knowledge: 1) knowledge of advanced or higher mathematics and 2) deep knowledge of the mathematics they will teach in grades 7-12. Nine semester hours of the secondary mathematics endorsement are aligned with the Conference Board of Mathematical Sciences (CBMS) guidelines of the Mathematical Education of Teachers (MET II) document, which calls for prospective mathematics teachers to focus on secondary mathematics content from an advanced standpoint.

Algebra for Secondary Mathematics Teaching:

➤ requires that students have successfully completed Calculus I
➤ covers topics from an advanced standpoint as well as from a teaching perspective
➤ is <u>not</u> intended to require Foundations of Algebra or Algebraic Structures as a pre-requisite

Description:
Algebra for Secondary Mathematics Teaching includes the exploration of important conceptual underpinnings, common misconceptions and students' ways of thinking, appropriate use of technology, and instructional practices to support and assess the learning of algebra. Secondary teachers should have an understanding of algebra as an extension of number, operation, and quantity; various ideas of equivalence as it pertains to algebraic structures; patterns of change as covariation between quantities; connections between representations (tables, graphs, equations, geometric models, context); and the historical development of content and perspectives from diverse cultures. In particular, the focus should be on deeper understanding of rational numbers, ratios and proportions, meaning and use of variables, functions (e.g., exponential, logarithmic, polynomials, rational, quadratic), and inverses. The intent is for teachers to develop the mathematical content and knowledge to teach the Utah Core Standards effectively.

Geometry for Secondary Mathematics Teaching:

➤ requires that students have successfully completed Calculus I
➤ covers topics from an advanced standpoint as well as from a teaching perspective

Description:
Geometry for Secondary Mathematics Teaching includes the exploration of important conceptual underpinnings, common misconceptions and students' ways of thinking, appropriate use of technology, and instructional practices to support and assess the learning of geometry. Secondary teachers should have a deep understanding of constructions and transformations, congruence and similarity, analytic geometry, solid geometry, conics, trigonometry, and the historical development of content and

perspectives from diverse cultures. These understandings are enhanced by explicitly making connections to various mathematical content strands (modeling, complex numbers, function, and algebra). The intent is for teachers to develop the mathematical content and knowledge to teach the Utah Core Standards effectively.

Statistics and Probability for Secondary Mathematics Teaching:

➢ requires that students have successfully completed Calculus I
➢ covers topics from an advanced standpoint as well as from a teaching perspective

Description:
Statistics and Probability for Secondary Mathematics Teaching includes the exploration of important conceptual underpinnings, common misconceptions and students' ways of thinking, appropriate use of technology, and instructional practices to support and assess the learning of statistics and probability. Secondary teachers should have a deep understanding of summarizing and representing data, study design and sampling, probability, testing claims and drawing conclusions, and the historical development of content and perspectives from diverse cultures. The intent is for teachers to develop the mathematical content and knowledge to teach the Utah Core Standards effectively.