

MATHEMATICS IN SECONDARY EDUCATION (GRADES 6 – 12) CONCENTRATION FORM

18 Graduate Credit Hours: 18 credits of Advanced Education Coursework in Mathematics and Mathematics Pedagogy

Student Name _____ Email _____

Advisor _____ Phone: _____ Email _____

Only six credit hours may be transferred from another institution, with approval of the Mathematics Advisor.

I: Twelve credits in Content-based Advanced Mathematics Courses for Secondary Mathematics Teachers (grades 6 – 12)

<u>Required</u>	Sem. Hrs.	Sem. Offered
<p>MATH 601 Analysis I for Teachers Develops the continuous ideas of calculus with particular emphasis on concepts as opposed to computational aspects of calculus. Specific topics to be covered include decimal representation of the real numbers, sequences, series, limits; differentiation to find speed, slopes of curves, and tangents; integration to find volumes and distances, area under curves. Optimization problems including maximization of area and volume and the modeling of these concepts. Graphing techniques will be supported by both the theory of calculus and graphing utilities</p>	3	Fall Odd Years
<p>MATH 604: Geometry for Teachers Covers standard topics from Euclidean geometry including a discussion of non-Euclidean geometries. The course will emphasize an informal and explorative approach to geometry and make use of the geometer sketchpad. Other topics will include geometric constructions and the role of proof in geometry. OR MATH 614: Rational Numbers & Proportional Reasoning for K-8 Teachers (Middle School teacher option) This course will cover the basic number strands in fractions and rational numbers, decimals and percents, and ratios and proportions in the school curriculum. Instruction will cover interpretations, computations, and estimation with a coordinated program of activities that develop both rational number concepts and skills and proportional reasoning.</p>	3	Spring Odd Years
<p>MATH 607: Algebraic Structures for Teachers Expands upon the customary operations on the integers and rationals to discuss systems that mimic these operations thereby enhancing ones understanding of the former. Emphasis will be placed on the concepts of multiplicative and additive inverses and their corresponding identities as they occur in other systems. Topics include the integers module and their connections to elementary number theory, permutation groups, rigid transformations, groups of symmetry of the plane and their connection to geometry, matrices treated as linear transformations and their connection to solutions of systems of equations.</p>	3	Fall Even Years
<p>MATH 608: Problem Solving in Mathematics Introduces a variety of challenging mathematics problems appropriate for secondary students for the purpose of analyzing and solving the problems, in a variety of ways, using the mathematics learned in the previous courses. In addition, students will search for such problems and orally present their solutions. The specific topics include areas covered in Math 601, 604, and 607.</p>	3	Summer Odd Years

Total of 12 Credits in Mathematics Content

II: Six credits in Advanced Pedagogy/Research in Mathematics Education for Secondary Teachers (Grades 6 – 12)

Required Courses in Advanced Pedagogy for Secondary Mathematics Teachers, Grades 6 - 12	Sem. Hrs.	Sem. Offering
EDCI 666: Research in Mathematics Teaching (online)	3	Each Spring
EDCI 702: Internship in Mathematics Education	3	Fall & Spring

**Total of 6 Credits in Mathematics Pedagogy
Concentration Total of 18 credits**