ASTL Advanced Studies in Teaching and Learning Graduate School of Education 7/12/13 George Mason University

ELEMENTARY MATHEMATICS CONCENTRATION FORM

Student Name:_____ **G#**_____

Email_____

In these courses the study of mathematical content is linked to classroom applications, providing leadership in school buildings, and sustaining communities of learners of mathematics. Courses will include appropriate uses of instructional technologies and physical materials, historical links, and meaningful applications.

Only six credit hours may be transferred from another institution.

Elementary (K-8) (18 credits)	Sem. Hrs.
Required Courses:	
Math 610 Special Topics: Number Systems & Number Theory for K-8 Teachers This course covers the topics: ways of representing numbers, relationships between numbers, number systems, the meanings of operations and how they relate to one another, and computation within the number system as a foundation for algebra. It also includes episodes in history and development of the number system, and will examine the developmental sequence and learning trajectory as children learn this material.	3
Math 611 Special Topics: Geometry and Measurement for K-8 Teachers The course explores the foundations of informal measurement and geometry in one, two, and three dimensions. The van Hiele model for geometric learning is used as a framework for how children build their understanding of length, area, volume, angles, and geometric relationships. Visualization, spatial reasoning, and geometric modeling are stressed. As appropriate, transformational geometry, congruence, similarity, and geometric constructions will be discussed.	3
Math 612 Special Topics: Probability and Statistics for K-8 Teachers An introduction to probability, descriptive statistics, and data analysis. Topics studied will include the exploration of randomness, data representation, modeling. Descriptive statistics will include measures of central tendency, dispersion, distributions, and regression. The analysis of experiments requiring hypothesizing, experimental design and data gathering will also be discussed.	3
Math 613 Special Topics: Algebra and Functions for K-8 Teachers The course will examine representing and analyzing mathematical situations and structures using generalization and algebraic symbols and reasoning. Attention will be given to the transition from arithmetic to algebra, working with quantitative change, and the description of and prediction of change.	3
Math 614 Special Topics: Rational Numbers & Proportional Reasoning for K-8 Teachers 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.	3
Additional Course Work: Choose One of the Following Courses	
EDCI 645 Curriculum Development in Math Education *Prerequisite: admission to mathematics education leadership master's degree program, or permission of instructor.* Yearlong seminar for master's level students in mathematics education leadership cohort program. Analysis, design, and evaluation of school mathematics curricula.	3
EDCI 646 Math Education Leadership for School Change—prerequisite: Admission to the Mathematics Education Leadership master's degree program or permission of the instructor. Yearlong seminar for master's-level students in mathematics education leadership cohort program. Surveys current literature and large-scale studies in mathematics education. Engages students in research, study, and discussion of factors that affect teaching and learning of mathematics in school settings	3
EDCI 666 Research in Mathematics Teaching This course explores curricula, current issues, and research literature in elementary school mathematics. It emphasizes the development of different styles of teaching.	3
Additional elective (s): Choose 3 credit math course approved by advisor	3

Please visit our website: http://gse.gmu.edu/programs/astl/