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Graduate School of Education
http://www.lesley.edu/prek-12-education-programs/

Certificate of Advanced Graduate Study

CURRICULUM and INSTRUCTION in MATHEMATICS

This certificate program in Curriculum and Instruction in Mathematics is designed for experienced educators who wish to extend their knowledge of specific aspects of instructional methodology, mathematics, and/or curriculum development. Coursework is selected in areas of study in which students wish to gain more in-depth knowledge, as well as in areas of research and evaluation and social and educational policy. The program consists of required coursework in adult learning and development, research methods, curriculum, and social and educational policy; offers opportunities for directed study, internships, or other field experience; and is geared to serve the needs of master teachers who wish to continue in the same role or to enter new roles as consultants, supervisors, or administrators.

Program prerequisite: Master's degree

Courses may have prerequisites for registration; please check course descriptions before registering.

Course Number	Course Title	Course Credits
Required Courses		**15**
EEDUC 8001	Advanced Professional Seminar	3
EEDUC 7121	Assessment Issues in Math: Summative and Formative	3
EAGSR 7004	Adult Learning and Development	3
CMATH 6114	Statistics and Data Analysis	3
EAGSR 7103	Qualitative Research Methods I	3
Concentration Area (select **six** from the following 3-credit courses, in consultation with advisor)		**18**
CMATH 6107	Constructing Mathematical Understanding: Number and Operations	
CMATH 6108	Constructing Mathematical Understanding for Number Theory	
CMATH 6109	Functions and Algebra I: Building Mathematical Understanding	
CMATH 6110	Functions and Algebra II: Broadening the Base	
CMATH 6111	Geometry and Measurement I: From Polygons to Pythagoras	
CMATH 6112	Geometry and Measurement II: Circles, Symmetry, and Solids	
CMATH 6113	Probability: The Mathematics of Uncertainty	
CMATH 6115	Concepts of Calculus: Change and Infinity	
Capstone/Qualifying Thesis		
EEDUC 7500	Curriculum and Instruction Thesis Project	**3**
TOTAL CREDITS		**36**

Accreditation:
Lesley University is accredited by the New England Association of Schools and Colleges and is authorized to offer degree programs in many states.

For more information, please visit our website lesley.edu

Please Note: Lesley University reserves the right to unilaterally add, withdraw, or revise any course offering in the above mentioned program of study including policies, provisions, requirements, and fees.

Lesley University is an Affirmative Action/Equal Opportunity institution and does not discriminate on the basis of age, race, religion, color, creed, national or ethnic origin, sex, sexual orientation, handicap or disability in its education programs, employment, or in admissions to, access to or treatment in its programs or activities.

Course Descriptions

EEDUC 8001 Advanced Professional Seminar
This interdisciplinary seminar will focus on professional identity development and issues of professional practice. Students will be introduced to reflective practice, systems analysis, and action research. Students from diverse disciplines will learn about collaborative problem solving for the systems in which they have to function. Emphasis will be placed on understanding the cultural, social, and community contexts for professional practice from a critical perspective.

EEDUC 7121 Assessment Issues in Mathematics: Summative and Formative
This course is designed to engage participants in the examination of both summative and formative assessments and their implications for teaching and learning. Various types of classroom assessments and how they can be used to make instructional decisions based upon student responses will be developed. Participants will also examine how to make sense of the scores reported via standardized tests, what they mean, and what the implications are at the district, school, classroom, and individual student levels.

EAGSR 7004 Adult Learning and Development
This course will review the theories, research, and models on adult learning and development. It explores the social context in which adults learn and develop, and the influences of race, class, gender, and culture. Students will be required to apply the material to a practice setting. This is a seminar designed for advanced graduate students.

CMATH 6114 Statistics and Data Analysis
This course on descriptive and inferential statistics uses a collaborative inquiry approach that will develop the participant's ability to critically collect, analyze, and describe qualitative and quantitative data and a variety of verbal, visual and numerical ways. The course will lead participants to becoming both better producers of statistical information and more critical consumers of data based claims and arguments. *Prerequisite: CMATH 6113*

EAGSR 7103 Qualitative Research Methods I
The purpose of this class is to learn to conduct qualitative social science research. Participants will read a variety of perspectives on the philosophical bases as well as tools of the practice of qualitative data gathering and analysis. Each participant will engage in a small qualitative study that is consistent with her or his graduate study goals. They will choose a topic and research setting, negotiate research relationships, collect and analyze data, and present findings. Readings, analytic memos, interview transcriptions, and field notes will provide material for the class to work with as co-consultants.

CMATH 6107 Constructing Mathematical Understanding: Number and Operations
Participants will develop a solid conceptual understanding of the language and operations of arithmetic, as well as the interrelationships among arithmetic, algebra and geometry. Topics include place value and the history of counting, inverse processes, the geometry of multiplication, the many faces of division, and conceptual models of integers and rationale numbers.

CMATH 6108 Constructing Mathematical Understanding for Number Theory
Participants develop a solid conceptual understanding of the branch of mathematics known as number theory. Topics include properties of prime, composite, abundant, deficient, and perfect numbers, divisibility rules, and the use of geometric and other representations for finding prime factorizations, and greatest common factors. Participants will also investigate the fundamental theorem of arithmetic, computing in different bases, and arithmetic progressions.

CMATH 6109 Functions and Algebra I: Building Mathematical Understanding
Participants develop a solid conceptual understanding of the branch of mathematics known as algebra. Topics will include ratio and proportion, slope, operations with integers, the notion of function, absolute value, linear versus non-linear functions, sets, equations, inequalities, simultaneous equations and demand functions.

CMATH 6110 Functions and Algebra II: Broadening the Base
This course builds its prerequisite, Functions and Algebra I, studying wider classes of functions, their graphs, and applications: detailed study of quadratic functions; solutions of quadratic equations; applications in physics and optimization; introduction to general polynomials and rational functions, with applications to physics and optimization; exponential functions with applications to growth and decay, and Newton's law of cooling.
Prerequisite: CMATH 6109

CMATH 6111 Geometry and Measurement I: From Polygons to Pythagoras
This first course integrates the study of geometry and measurement and includes lines, angles, investigations of triangles including sorting, similarity, trigonometry, and Pythagoras' Theorem. We will also investigate quadrilaterals, polygons, area and perimeter. Participants will examine the nature of geometric definitions, and follow a path that explores mathematical explanation, argument, and justification and how these processes connect to geometric proof.

CMATH 6112 Geometry and Measurement II: Circles, Symmetry, and Solids
The second geometry and measurement course starts with a focus on measurement and picks up where course one leaves off. Topics include finding the area of irregular shapes, investigating circles, exploring symmetry, and looking at both the geometry and measurement of 3 dimensional solids. Participants will continue to explore how processes of mathematical explanation and justification connect to geometric proof.
Prerequisite: CMATH 6111

CMATH 6113 Probability: The Mathematics of Uncertainty
The course develops basic methods and concepts of probability theory, along with typical real-world applications. Students prepare and evaluate probability investigations. The presentation is based on problem solving and mathematical discussion. This course is a co-requisite of the Statistics and Data Analysis course. *Prerequisite: CMATH 6109*

CMATH 6115 Concepts of Calculus: Change and Infinity
Building on prior number, functions, and geometry courses, calculus extends ideas developed there to the concepts of limit and change. Participants are introduced to an important branch of modern mathematics and are shown how calculus relates to other more elementary areas of mathematics. Topics include ideas of a limit, the concept of instantaneous change, and the fundamental theorem of calculus. *Prerequisites: CMATH 6110 and CMATH 6112*

EEDUC 7500 Curriculum and Assessment Thesis Project
This C.A.G.S. thesis project course is designed to assist students in developing and implementing a project that will contribute to the field of education. The project also helps to demonstrate that at the end of the C.A.G.S. program, students have learned how to conduct research, plan a major initiative, synthesize information, and present the work to an appropriate and critical audience.