I.   Outline of the proposed major, concentration, license, or certificate including catalog copy.

CURRICULUM AND INSTRUCTION SPECIALIST/ MIDDLE SCHOOL MATHEMATICS

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The Middle School Mathematics Curriculum and Instruction Specialist concentration is designed for the middle school classroom teacher who wants to improve instructional skills as well as expand knowledge and skills in mathematics and be eligible to teach Algebra I. Virginia teachers at the middle school levels must possess a deep understanding of the mathematics they are teaching, an understanding of how it connects to higher levels of mathematics, and a skilful use of methods to guide students in the learning. Well-prepared teacher leaders in a specialist's role can have a significant influence on strengthening content, pedagogical, and assessment knowledge of those classroom teachers who are inadequately prepared to deliver significant mathematics programs. They can also provide the professional development that is critical for improving instruction and student learning. Applicants to this program must hold a valid Virginia Collegiate Professional Teaching License or equivalent from another state and have at least two years teaching experience including mathematics curriculum. Completion of this program meets current eligibility requirements for the Postgraduate Professional License, an add-on endorsement to teach Algebra I, and an add-on endorsement as a K-8 Mathematics Specialist.

PROGRAM REQUIREMENTS

EDUC 502   Research Design (3)
EDUC 699   Comprehensive Examination (0)
MAED 623   Instructional Design in Mathematics for Grades K-8 (3)
MAED 625   Assessment in Mathematics (3)
MAED 650   Mathematics Specialist Leadership (3)
MATH 671   College Algebra for Middle School Teachers (3)
MATH 672   Discrete Mathematics for Middle School Teachers (3)
MATH 673   Trigonometry and Algebra for Middle School Teachers (3)
MATH 674   Mathematical Programming for Middle School Teachers (3)
MATH 675   Linear Algebra for Middle School Teachers (3)
MATH 677   Euclidean Geometry for Middle School Teachers (3)
MATH 678   Calculus for Middle School Teachers (3)
MATH 679   Probability and Statistics for Middle School Teachers (3)

TOTAL HOURS REQUIRED   36

II.   New courses which will be proposed that will be a part of this program.

MATH 671   College Algebra for Middle School Teachers (3)
MATH 672   Discrete Mathematics for Middle School Teachers (3)
MATH 673   Trigonometry and Algebra for Middle School Teachers (3)
MATH 674   Mathematical Programming for Middle School Teachers (3)
MATH 675   Linear Algebra for Middle School Teachers (3)
MATH 677   Euclidean Geometry for Middle School Teachers (3)
MATH 678   Calculus for Middle School Teachers (3)
MATH 679   Probability and Statistics for Middle School Teachers (3)

III.   Rationale for the program.

In 2005, Longwood approved the Curriculum and Instruction Specialist in K-8 Mathematics Master of Science degree. The mathematics leadership course, MAED 650, and the five mathematics courses, MATH 651, 653, 655, 657, and 659, were developed through the cooperation of James Madison University, Longwood University, Norfolk State University, University of Mary Washington, University of Virginia, Virginia Commonwealth University, and Virginia Tech.   Since 2005, many teachers have been trained as mathematics Specialists and are working in that role in school systems around Virginia.

Mathematics Supervisors have been worried that these courses did not adequately prepare Mathematics Specialists to serve in the middle school setting.   This concern has verified by the much stronger scores in the Virginia Standards of Learning in Mathematics in grades 3-5 than in grades 6-Algebra I. Although grade 8 and Algebra I have a much higher passing rate than Grades 6 and 7, the percent passing at an advanced score is in line with those in grades 6 and 7.

	Grade 3 Passed	Advanced	Grade 4 Passed	Advanced	Grade 5 Passed	Advanced
2006-2007	89%	48%	81%	37%	87%	48%
2007-2008	89%	51%	84%	42%	88%	53%
2008-2009	89%	45%	86%	48%	90%	57%

	Grade 6 Passed	Advanced	Grade 7 Passed	Advanced	Grade 8 Passed	Advanced	Algebra I Passed	Advanced
2006-2007	60%	21%	56%	20%	77%	41%	92%	22%
2007-2008	68%	29%	65%	24%	83%	45%	97%	13%
2008-2009	73%	32%	71%	28%	85%	51%	94%	27%

Post and Harwell (2008) found that when middle-grade students were exposed to standards-based reform curricula coupled with teachers who were required [and so trained to] teach standard-based curricula, increased student achievement in problem-solving was statistically significant.   Gearhart, found that although, "improved curriculum materials can provide rich activities that support students' mathematics investigations, in and of themselves such materials may not be sufficient enablers of instruction that affords pursuit of conceptual issues (1999)." According to Tarr, subsequent findings demonstrated that "although a Standards-based curriculum alone can positively influence teacher pedagogy, the results are especially promising if combined with high fidelity of implementation and effective instruction of these new materials (2008)."

In 2007, Virginia Commonwealth University and University of Virginia wrote a grant to create a new master's program to prepare the middle school mathematics specialist. This program is presently being developed.

Also in 2007, the Virginia Department of Education requested that a new set of courses be designed to better prepare teachers to teach Algebra I. College of William and Mary, George Mason University, Longwood University, Mary Washington University, and Virginia Commonwealth University began working with University of Virginia to create these courses. Longwood University has offered MATH 671and MATH 679 and is presently offering MATH 677 through a Mathematics and Science Partnership (MSP) grant.

 This program combines the efforts of these two programs to create the new Curriculum and Instruction Specialist in Middle School Mathematics Bachelor of Science degree. The program is designed to maximize the number of eligible teachers by combining the Algebra I endorsement with the Mathematics Specialist licensure. Through the present MSP grant, teachers in Charlotte, Halifax, Mecklenburg, Nottoway, and Prince Edward have taken the first courses. These teachers will make up the first cohort for this program.

Proposed schedule for graduate courses:

Summer 2009	Math 671	Educ 502
Fall 2009	Math 679	Educ 502
Spring 2010	Math 677	Educ 502
Summer 2010	Math 672, Math 675	Educ 502
Fall 2011	Math 673	Educ 502
Spring 2012	Math 678	Educ 502
Summer 2012	Math 674, Maed 623	Educ 502
Fall 2012	Maed 625	Educ 502
Spring 2013	Maed 650	Educ 502

Future program offerings will be offered for cohort groups. Each cohort group must have a minimum of 10 and a maximum of 20. Each graduate course will require a minimum of 10 and a maximum of 20.

The Mathematics and Computer Science Department can do this with existing resources by only having one cohort in Elementary Mathematics and one cohort in Middle School Mathematics. Since 2006, the department has had 2 – 3 cohorts each year in K-8 Mathematics. The department will not need to teach more than two graduate courses during any semester during the academic year for the two master's programs combined.