INTERDISCIPLINARY STUDIES, MASTER OF (M.I.S.), WITH A CONCENTRATION IN INTERDISCIPLINARY MATHEMATICS AND SCIENCE LEADERSHIP/K-8 MATHEMATICS SPECIALIST

Program goals
The interdisciplinary mathematics and science leadership concentration in the M.I.S. program is designed for in-service teachers of mathematics for kindergarten through eighth grades. In designing their individual programs, students, in conjunction with their advisers, may select courses offered by VCU mathematics, science and education departments and courses offered by other collaborating Virginia colleges and universities. The Graduate School, the College of Humanities and Sciences, the School of Education and the departments of Mathematics and Applied Mathematics and Teaching and Learning administer the program.

Student learning outcomes
1. Students will write mathematics (not including mathematical proofs) clearly, concisely and correctly.
2. Students will solve mathematical problems.
3. Students will use multiple representations to correctly describe mathematical ideas.
4. Students will study K-12 children's work and use it to demonstrate knowledge of children's thinking.
5. Students will write mathematical proofs clearly, concisely and correctly.
6. Students will collaborate on projects.
7. Students will read and comprehend mathematical works and mathematics education works, including national and state standards.
8. Students will analyze and synthesize mathematics education literature.
9. Students will make effective written and oral presentations to demonstrate their understanding of mathematical ideas and mathematics education ideas.
10. Students will (a) analyze and develop rich mathematical tasks for children and adults, (b) study and implement models of mathematics coaching, (c) study and implement professional development models.
11. Students will study and implement models of formative and summative assessment.
12. Students will study and implement effective methods of communicating with teachers and administrators.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs
The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students. (http://bulletin.vcu.edu/academic-regs)

Degree candidacy requirements
A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master's or doctoral status according to the degree candidacy requirements of the student's graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student's faculty regarding the student's academic achievements and the student's readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (http://bulletin.vcu.edu/academic-regs/grad/candidacy)

Graduation requirements
As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (http://bulletin.vcu.edu/academic-regs/grad/graduation-info)

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).
Admission requirements

Degree: Semester(s) of entry: Deadline dates: Test requirements:
M.I.S. Fall, spring, summer Contact program administrator GRE-General or MAT

Special requirements

• Upon review of the application and all supporting documentation, the mathematics/science leadership program coordinator will contact applicants to schedule interviews to develop programs of study that will detail specific courses to be taken and the institutions offering those courses.

In addition to the general admission requirements of the VCU Graduate School (http://bulletin.vcu.edu/graduate/study/admission-graduate-study/admission-requirements), the following requirements represent the minimum acceptable standards for admission:

1. At least three years of successful K-8 mathematics and/or science teaching experience
2. Three recommendations: at least one from an immediate supervisor or principal and at least one that addresses leadership potential
3. Submission of satisfactory scores on either the GRE or MAT from a current test (fewer than five years old) (Provisional admission may be granted pending fulfillment of this requirement.)
4. A written statement of intent that provides evidence of at least three years of experience in teaching mathematics and/or science for kindergarten through eighth grades
5. Interview to develop program of study (Program director will contact student after initial review of application.)

Degree requirements

In addition to general VCU Graduate School graduation requirements (http://bulletin.vcu.edu/academic-regs/grad/graduation-info), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Students in the interdisciplinary mathematics and science leadership concentration are required to earn a minimum of 36 graduate-level credit hours beyond the baccalaureate. The discipline focus areas are required to be in mathematics and either the sciences or mathematics/science education. At least one-half of the credit hours presented for graduation must be at the 600 level or higher.
2. Other requirements: At least 18 of the 36 credits, including the final project, must be granted by VCU. Up to six transfer credits may be approved, and the remainder of the credits must be from consortium partners as approved by the students’ advisers, the VCU Graduate School and the Mathematics and Science Leadership Advisory Committee. A maximum of six hours may be taken as a nondegree-seeking student before admission to the program.
3. The final project must be supervised by a VCU graduate faculty member, may be in mathematics, science or education and must include an indication of the relationship of the subject of the project to teaching at the kindergarten-through-eighth-grade level.

Curriculum requirements

MATH 661 Number and Operations 3

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 662</td>
<td>Geometry and Measurement</td>
<td>3</td>
</tr>
<tr>
<td>MATH 663</td>
<td>Functions and Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 664</td>
<td>Statistics and Probability</td>
<td>3</td>
</tr>
<tr>
<td>MATH 665</td>
<td>Rational Numbers and Proportional Reasoning</td>
<td>3</td>
</tr>
<tr>
<td>TEDU 657</td>
<td>Mathematics Education Leadership I</td>
<td>3</td>
</tr>
<tr>
<td>TEDU 658</td>
<td>Mathematics Education Leadership II</td>
<td>3</td>
</tr>
<tr>
<td>TEDU 659</td>
<td>Mathematics Education Leadership III</td>
<td>3</td>
</tr>
<tr>
<td>TEDU 680</td>
<td>Externship Proposal Seminar</td>
<td>3</td>
</tr>
<tr>
<td>TEDU 700</td>
<td>Externship</td>
<td>3</td>
</tr>
</tbody>
</table>

Elective courses

Select from the following with adviser approval:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL (500- and 600-level)</td>
<td>Biomedical Sciences</td>
<td>12</td>
</tr>
<tr>
<td>CHEM (500- and 600-level)</td>
<td>Chemistry</td>
<td>12</td>
</tr>
<tr>
<td>MATH (500- and 600-level)</td>
<td>Mathematics</td>
<td>12</td>
</tr>
<tr>
<td>TEDU (500- and 600-level)</td>
<td>Education Leadership</td>
<td>12</td>
</tr>
</tbody>
</table>

Total Hours 36

Total graduate credit hours required (minimum) 36

Graduate program director
Aimee J. Ellington, Ph.D.
Director, M.I.S. interdisciplinary mathematics and science leadership program
Email: ajellington@vcu.edu
Phone: (804) 828-5521

Program website: math.vcu.edu/graduate-programs/mis-specialists
(http://math.vcu.edu/graduate-programs/mis-specialists)