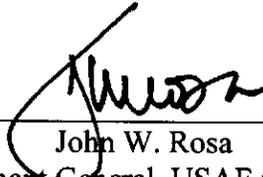
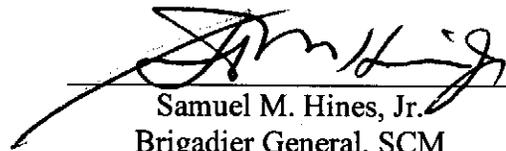


Program Planning Summary  
M.Ed. in Interdisciplinary STEM Education



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Lieutenant General, USAF (Retired)  
President



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## **Master's Degree in Interdisciplinary STEM Education Program Planning Summary**

Program Title:	Master of Education in Interdisciplinary STEM Education
Academic Unit:	The Citadel, School of Education
Designation, type, and level of degree:	MEd
Credit Hours:	34
Proposed date of implementation:	September 2013
CIP Code:	130101
Identification of Program as New or Modification:	New
Site:	Online (Blackboard) / Nationwide
Delivery mode:	Online

### Overview and Justification

The Schools of Engineering, Education, and Science and Mathematics, and the STEM Center of Excellence have in a collaborative endeavor developed an interdisciplinary masters degree in science, technology, engineering, and mathematics (STEM) education: the *Master of Education in Interdisciplinary STEM Education*. The overarching goal of this initiative is to improve middle and high school teacher effectiveness and significantly increase the number of high school graduates who are inspired to pursue and prepared to succeed in STEM degrees in college.

A STEM literate nation is critical to the United States' continued success in our global economy and the ability of American students to compete in the global workforce. Because of that, STEM education is at the forefront of our national and regional agendas. Both national and global development, defense, and sustainability are contingent upon fostering a passion for and innovations in the STEM disciplines.

In order to advance student learning in STEM, to inspire and prepare students to pursue careers in the STEM disciplines, and to enable our students to be successful in the global economy, highly qualified educators equipped with cutting edge STEM knowledge and 21st century skills are required. Educator preparation in current pedagogical practices and relevant and engaging STEM content is integral to student success and inspiration in the STEM disciplines. This program utilizes an interdisciplinary instructional approach with emphasis on modern pedagogy and progressive STEM content to ensure that educators completing this Master's level program are prepared to teach in a 21st century world and can engage students with 21st century tools and curricula.

A graduate successfully completing this degree program will be adept at creating relevant projects for use in their classrooms and utilizing project-based instruction to more effectively engage their students in the STEM disciplines. This program will provide an advanced degree related to the development and practice of modern pedagogy and progressive STEM content. Classes will be offered online through Blackboard and available to a nationwide audience.

This program is designed primarily for current middle and high school educators of the STEM disciplines, military personnel and educators of informal education centers (such as aquariums, museums, and others) seeking advancement of their skillset.

Ultimately, the curriculum aims to create 21st century STEM educators and leaders by facilitating a broader understanding of the interdisciplinary nature of STEM, a deeper knowledge of discipline-specific content, and new integrative approaches for the teaching and learning of STEM content. The coursework

is intended to inspire in teachers a passion for STEM and an ability to effectively teach STEM content in an engaging way with career and industry applications.

Demand for the Program and Productivity

Locally, a survey was disseminated to K-12 educators of all disciplines. The survey assessed the interest of Lowcountry educators in a master’s degree in interdisciplinary STEM education and directed respondents to share preferences regarding on-site vs. online delivery of coursework. One hundred fifty-six (156) teachers responded to the survey as of March 2012.

Of the respondents:

- 54% (84 teachers) identified this degree program as between *moderately* and *extremely* important to their career goals.
- 85% (133 teachers) identified the online coursework option as *moderately* to *extremely* important.
- 53% (83 teachers) indicated that they would be *moderately* to *extremely* likely to register “today” for on online MEd in Interdisciplinary STEM Education.

It is estimated that the program will graduate a minimum of 15 students per year.

Relationship of the Proposed Program to Other Related Programs within The Citadel

The Master’s degree in Interdisciplinary STEM Education compliments current degree programs currently offered by The Citadel: As part of a larger effort to enhance mathematics and science literacy in the region, The Citadel has launched an accelerated Master of Art in Teaching in Biology and in Mathematics to attract more mid-level science and mathematics professionals who are interested in becoming highly qualified high school teachers of biology and mathematics. By reducing the time needed to complete the MAT in either Biology or Mathematics to fifteen months, the program is made more attractive to professionals interested in teaching as a second career, thereby increasing the number of qualified teachers in these critical need areas. The Master of Arts in Education in Mathematics is a degree program designed to enhance the mathematical knowledge and teaching techniques of middle and secondary mathematics educators. The Master’s degree in Interdisciplinary STEM Education is another innovative initiative that works to improve the effectiveness of current educators and significantly increase the number of high school graduates who are prepared to succeed in STEM degrees in college.

Similarities or Differences Between the Proposed Program and Those at Other Institutions

An investigation into similar programs at other institutions within and outside of South Carolina was conducted. Within South Carolina, no other master’s level degree programs in interdisciplinary STEM education could be found. Other higher educational institutions within South Carolina offer degree programs for science and mathematics educators but not a truly interdisciplinary STEM degree program. The MEd in Interdisciplinary STEM Education at The Citadel is unique to other similar programs in that it integrates the STEM disciplines in a holistic way in an online environment and progressively builds interdisciplinary teaching skills and content knowledge.

Outside of South Carolina, there are approximately 12 similar programs mostly focusing on pedagogy and traditional science coursework but lacking the interdisciplinary approach.

Curriculum

The MEd in Interdisciplinary STEM Education consists of thirty-four (34) credit hours, organized into two areas – core and electives. The coursework will consist of nineteen (19) hours of core coursework and fifteen (15) hours of electives. Transfer credit into the program will be accepted in accordance with The Citadel Graduate College policy on transferring graduate credit.

Core	Course Name	Credits
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<b>Coursework (Required)</b>	Teaching, Learning and Assessing with Technology	3
	Project Based Learning and Interdisciplinary Teaching	3
	Developing STEM Disciplinary Literacy Skills	3
	Leadership and Critical Issues in STEM Education	3
	Research and Statistics for STEM Applications	3
	Foundations in STEM I	2
	Foundations in STEM II	2
<b>Choose five electives from the list below:</b>		
<b>Electives</b>	Nanotechnology	3
	Biotechnology	3
	Engineering Applications in STEM	3
	Programming for STEM Educators	3
	Mathematical Technology Resources for STEM Education	3
	The Chemistry of Art	3
	STEM Education Through Robotics	3
	Forensic Science	3
	Multidisciplinary Experimental Design and Implementation	3
	<b>Total Credits</b>	<b>34</b>

### Estimated Cost

Year	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	Total
Program Administration						
Faculty Salaries (if offering 8 courses/yr)	\$18,400	\$36,800	\$36,800	\$36,800	\$36,800	\$165,600
Graduate Assistants	N/A	N/A	N/A	N/A	N/A	
Clerical/Support Personnel	TBD	TBD	TBD	TBD	TBD	TBD
Supplies and Materials	TBD	TBD	TBD	TBD	TBD	TBD
Library Resources	TBD	TBD	TBD	TBD	TBD	TBD
Equipment	N/A	N/A	N/A	N/A	N/A	
Facilities	N/A	N/A	N/A	N/A	N/A	
Other (ITS Course Developer, estimated)	\$50,000	N/A	N/A	N/A	N/A	\$50,000
Faculty Developers	\$70,000	N/A	N/A	N/A	N/A	\$70,000
<b>TOTAL</b>						<b>~\$305,600</b>
<b>SOURCES OF FINANCING BY YEAR</b>						
Strategic Initiative Funds (development)	\$70,000	TBD	TBD	TBD	TBD	\$70,000
Estimated FTE Revenue from the State	TBD					
Tuition Funding (New Students Only at \$501/credit hour)	\$112,725	\$112,725	\$112,725	\$112,725	\$112,725	\$563,625
Other State Funding (Legislative Approp.)	TBD	TBD	TBD	TBD	TBD	
Reallocation of Existing Funds	TBD	TBD	TBD	TBD	TBD	
Federal Funding	TBD	TBD	TBD	TBD	TBD	
Other Funding (Endowment, Auxiliary, etc.)	TBD	TBD	TBD	TBD	TBD	
<b>TOTAL</b>						<b>\$633,625</b>