



EMMANUEL COLLEGE

# The Center for Science Education





## THE CENTER FOR SCIENCE EDUCATION AT EMMANUEL COLLEGE

With the establishment of the Center for Science Education, Emmanuel College continues its commitment to expanding its role in urban education and preparing K-12 students in the critical field of science. As a college historically dedicated to cultivating first generation students, Emmanuel College has long recognized its responsibility to provide educational opportunities to the urban community. The Center for Science Education at Emmanuel will continue this commitment by educating urban youth in evolving scientific fields.

Through Emmanuel College's collaborations with urban partner schools, its unprecedented partnership with Merck Research Laboratories-Boston and continual program development through the Carolyn A. Lynch Institute, the College has continued to respond to the growing needs of educational progress, specifically in the fields of mathematics and science. The Center for Science Education at Emmanuel College will utilize the extensive opportunities provided by the College's Academic Science Center upon its completion in 2009, allowing Emmanuel to expand upon its success in implementing educational outreach programs, preparing students for careers in science and providing leadership in science education throughout the Commonwealth of Massachusetts and the nation.



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## *Need for Improved Science Education*

Studies show that students in the U.S. rank well below their peers in math and science skills. Recent statistics expose a lack of inquiry-based science education throughout K-12 programs across the nation, with a concern about the number of teachers instructing without proper certification, especially within urban settings. In Massachusetts, results from last spring's MCAS science exam revealed that more than a quarter of the state's high school students failed the test, with dozens of urban high schools registering a failure rate of 50 percent or higher. This data indicates an urgent need for reform in science education, starting at the elementary school level. Consider:

- Only 29 percent of American fourth grade students, 32 percent of eighth grade students, and 18 percent of high school seniors performed at or above the proficient level in science
- Nationwide, only five percent of high school students are learning science through research and inquiry; among elementary schools the percentage is slightly higher yet still alarming at 30 percent
- About 60 percent of high school physical science students have teachers who either did not major in the subject in college or are not certified to teach it

In Massachusetts, one of the country's leading centers in the biotech and pharmaceutical industries, poor results on the MCAS science exam have created a sense of urgency towards improving achievement. Recent initiatives by the Department of Education are calling for more rigorous guidelines for preparing students for college-level work, with particular focus on the sciences. Starting in 2010, the state will require students to pass one of the four MCAS subject tests in biology, chemistry, physics, or technology and engineering, in order to graduate.





## *Science Education at Emmanuel College*

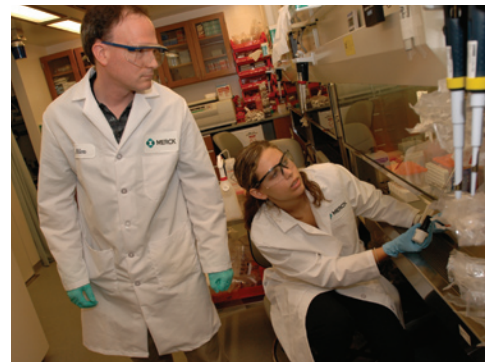
Emmanuel College's commitment to educational advancement in the sciences is exemplified through its partnership with Merck Research Laboratories-Boston, as well as through the construction of its Academic Science Center, which represents the College's continued goal of building distinctive academic programs in the liberal arts and sciences by leveraging its unique location in Boston and in the heart of the Longwood Medical Area. With the establishment of the Center for Science Education at Emmanuel College, Emmanuel will be able to further its long-standing commitment to urban youth outreach in addition to providing opportunities for professional teacher development, similar to those featured through the Carolyn A. Lynch Institute for Early Mathematics Learning.

Upon completion of the Academic Science Center, teachers will be able to utilize laboratories and faculty/student research space among the four floors and 47,500 sq. feet of the new Center, with the objective of strengthening their comprehension and preparation in science and technology disciplines.



Emmanuel's five-year plan for the Center for Science Education involves the development of pilot programs that will serve the nation as a source for advancement in science edification. Additional offerings of the Center will include:

- Eight week Summer Science Immersion programs for gifted urban high school students
- Saturday Science Program for urban middle school students
- Workshops for elementary, middle and high school teachers in science content and pedagogy, with special emphasis on chemistry and physics, that would lead to recertification
- Laboratory facilities and programs to support Boston high school Advanced Placement (AP) courses
- The involvement of research institutions, hospitals and pharmaceutical companies in the Longwood Medical Area in the professional development of teachers
- The use of the facility to host regional meetings of high school science teachers' professional organizations
- Materials and supplies for hands-on science experiments in urban schools



## FIVE YEAR PROJECTIONS FOR THE CENTER FOR SCIENCE EDUCATION

- ▶ Recertification Workshops for Elementary, Middle and High School Teachers  
*Affecting 600 Teachers and Their 12,000 Students*
- ▶ Summer Immersion Program for Urban High School Students  
*Reaching 200 Students*
- ▶ Saturday Science Program for Urban Middle School Students  
*Reaching 1,000 Students*
- ▶ Advanced Placement Labs for Urban High School Students  
*Serving 500 Students*
- ▶ Equipment and Supplies for Urban High School Students  
*Supporting 100 High School Teachers and Their 2,000 Students*
- ▶ High School Science Teachers' Professional Organizations Meeting on the Emmanuel Campus  
*Supporting 250 Teachers*



## *Emmanuel College's Commitment to Educational Advancement*

Emmanuel College, throughout its 89-year history, has been an institution of higher learning dedicated to transforming lives and making a better world. A community with a lifelong passion for teaching and learning, Emmanuel strives to foster a sense of empowerment through education, transform individuals and open doors. At the core of the College's mission is a commitment to not only challenge students to become critical thinkers and ethical decision makers, but contributing members of the local community and global society. With students encouraged to take advantage of the College's unique location, the city of Boston and its resources have become an extended classroom for students and faculty alike. In turn, the College's longstanding dedication to supporting the educational advancement of urban youths has allowed the College and city to have a symbiotic relationship.

Through the Carolyn A. Lynch Institute at Emmanuel College, which strives to increase and improve the mathematics literacy of elementary students through innovative training programs for teachers, Emmanuel has been able to positively impact the quality of education in urban schools. Programming within the Lynch Institute's Center for Early Mathematics Learning has specifically addressed the need for training of primary level teachers, who are responsible for educating students during a time of significant development in mathematical knowledge.

Two years ago, the Center for Early Mathematics Learning piloted a course entitled Early Assessment and Intervention in Mathematics for teachers working in the College's partner schools. The two-part course was designed to train teachers in a range of early intervention strategies and assessments in implementing models for early diagnosis and prescriptive approaches in mathematics PreK-2. Teachers identified two students in their classrooms who were considered to be at risk in mathematical development, and were asked to apply the instructional strategies from the course to the students. Results from the course revealed significant improvements. Students on average made more than eight months progress

in less than four months time, with about 25 percent of the students making a year or more progress. Since the pilot program, the Center for Early Mathematics Learning has continued to offer innovative training opportunities for teachers. During the fall 2007, interest in Early Assessment and Intervention in Mathematics Part I was so strong that two sessions were offered. Overall, the participation of approximately 150 teachers in the program has impacted more than 3,000 students.



## *Conclusion*

Emmanuel College's success with professional development and commitment to the improvement of science education is well documented. As the need for superior educational preparation intensifies across the U.S., Emmanuel remains steadfast in its commitment to offer support. Through distinctive programming, the College can provide a foundation for strategic long-term development in science education, inspiring both students and teachers alike through creative exploration of scientific disciplines.

As an innovator among institutions of higher education through collaboration with Merck and a commitment to building a new state-of-the-art science center, Emmanuel College continues to be a model of unwavering devotion to the future of science education. With the addition of the Center for Science Education at Emmanuel College, the College will continue to provide leadership in the field throughout Massachusetts and the nation, meanwhile maintaining its mission of service to others.





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