



U. S. Department of Education

**Project Abstracts for New  
Grantees for FY 2008**

Funded under Title III, Part E:  
Minority Science and Engineering  
Improvement Program (MSEIP)  
(CFDA Number: 84.120 A)

Office of Postsecondary Education  
Washington, DC 20006-8517

## Introduction

The purpose of the Minority Science and Engineering Improvement Program (MSEIP) is to effect long-range improvement in science and engineering education at predominantly minority institutions and to increase the flow of underrepresented ethnic minorities, particularly minority women, into scientific and technological careers. (MSEIP) supports the Federal Government's efforts to improve and expand the scientific and technological capacity of the United States to support its technological and economic competitiveness.

The specific objectives of MSEIP include the following: (a) to improve access of minority students in undergraduate and graduate science and engineering through community outreach programs conducted through eligible minority institutions, (b) to improve in the quality of preparation of students for careers in science, technology, engineering, and mathematics (STEM) graduate work, (c) to improve the capability of minority institutions for self-assessment, management, and evaluation of their science programs and dissemination of their results, and (d) to improve existing capabilities of minority institutions in the areas of planning and implementation of science and engineering programs, so they will achieve the ability to compete more effectively in assistance programs not specifically intended for minority groups or institutions.

Awards under MSEIP in fiscal year 2008 are for 12 to 36 months to support three types of grants: Institutional, Cooperative, and Special Project. Each grant type is described below. For the Fiscal Year 2008 MSEIP competition, we announced in the Federal Register Closing Date Notice that we would not award Design grants.

Institutional grants support the implementation of a comprehensive science improvement plan, which may include any combination of activities for improving the preparation of minority students, particularly minority women, for careers in science.

Cooperative grants assist groups of nonprofit accredited colleges and universities working together to conduct a science improvement program. Any nonprofit accredited college or university may participate in a cooperative grant; however, the fiscal agent must be an eligible minority institution.

Special grants are designed to assist minority institutions with activities that improve the quality of training in science and engineering at minority institutions or enhance the minority institution's general scientific research capabilities. A Special grant may be given to any applicant supporting activities that provide a needed service to a group of eligible minority institutions. Special grants may also be used to provide in-service training for project directors, scientists, and engineers from eligible minority institutions.

MSEIP supports pre-college programs (K-12), tutoring for pre-college and college students, faculty development, curriculum development, renovation of STEM labs/classrooms, stipends for program participants, and a wide range of activities designed to increase minority STEM graduates. As the nation's population becomes more diverse, it is important that the educational and training of all Americans are met so that our nation remains a global technological leader. This paper summarizes the abstracts for new awards funded under the fiscal year 2008 appropriation.

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**P120A080064**

**University of the Sacred Heart, PR  
(Universidad del Sagrado Corazon), PR  
Grant Type: Institutional**

## **ABSTRACT**

In 2001, with the support of a U.S. Department of Education Fund for the Improvement of Postsecondary Education (FIPSE) grant, the University of the Sacred Heart (USH) developed a program to integrate Spanish and English in core courses taught only in Spanish. In 2007, the American Council on Education commended the Language Development Across the Disciplines program of the University of the Sacred Heart with Honorable Mention as an example of "Excelencia" for accelerating Latino student success in academic achievement through development of their language skills at the postsecondary level. Based on this experience and guided by the national emphasis on science, technology, engineering, and mathematics (STEM) education to support the technological and economic competitiveness of the United States, we propose to expand our services to STEM courses identified by USH Department of Natural Sciences faculty, in order to increase the number of traditionally underrepresented minorities, particularly Hispanics, in science careers. We will refer to this new program as STEM@LAD.

During a three-year period, STEM@LAD will revise and pilot test twelve (12) STEM courses, four per year selected based on English intensive content, books and materials used and/or discipline-specific readings required. STEM course language enhancement will follow a three-semester cycle of course revision, pilot testing and assessment. Some eighty (80) students will be impacted during each program cycle. The STEM@LAD experience will reduce language anxiety of science and technology students and increase their confidence and potential for success.

Evaluation will be systematic and will produce the documentation needed for replicability. Data will be gathered on yearly persistence of STEM students until graduation. Years 2004 through 2007 will be compared to years 2008 through 2011 data. We expect to show at least a 10 percent yearly increase of students entering STEM disciplines and a significant difference in students' grades and persistence.

**P120A080051**

**University of Puerto Rico-Rio Piedras Campus, PR**

**Grant Type: Institutional**

### **ABSTRACT**

The Department of Chemistry at the University of Puerto Rico at Río Piedras is one of the most successful science programs in Puerto Rico in terms of productivity and commitment providing high quality chemistry education for approximately 1,700 undergraduate Hispanic students per year. However, there are pressing needs for updated curriculum and equipment in the general and analytical chemistry laboratories to incorporate more hands-on learning experiences. Furthermore, a new biochemistry laboratory must be developed to meet the needs of graduates for future employment and further study, and to align the curriculum with the accreditation guidelines of the American Chemical Society. Therefore, we request Minority Science and Engineering Improvement Program (MSEIP) Institutional funds to equip these laboratories with modern instruments and to support the necessary curricular improvements in order to assure high-quality education in chemistry for our primarily Hispanic students.

This application will ascertain success for the following goals in agreement with the MSEIP goals for minority STEM students, especially women:

Goal 1: By providing increased quality of hands-on chemistry education in three critical areas - general chemistry, analytical chemistry, and biochemistry, we seek to increase cohort graduation rates, decrease average graduation times, and improve retention;

Goal 2: Increasing the quality and productivity of research in chemical education by 20 percent;

Goal 3: Installing a faculty-mentoring program;

Goal 4: Improving long-range learning enhancement for all science students;

Goal 5: Enhancing the laboratory skills of data collection and analysis; and

Goal 6: Exposing 30 Hispanic Chemistry major students each year to the highly relevant areas of biochemistry and biotechnology in inquiry guided experiences.

The changes will be implemented over a period of three years by highly qualified Chemistry faculty, after which the University of Puerto Rico at Río Piedras will support these initiatives to ascertain continuity of the urgently needed changes implemented.

**P120A080093**  
**Howard University, DC**  
**Grant Type: Institutional**

## **ABSTRACT**

This proposal seeks funding to support a Cyberinfrastructure (CI) community to include pre-college students, faculty from Howard University, undergraduate students, high school teachers, and external member researchers that use CI resources. The goal is to expose students to cutting edge research that would enhance their scientific knowledge for them to succeed and to pursue careers in science and engineering.

The elements of the proposal include curriculum innovations at the university and in the proposed high schools, a summer institute each year of the proposed three-year grant in addition to the conduct of year-round research in using CI. A secondary element of the proposal is to develop faculty members to become aware of the CI environment and thereby serve as mentors for high school and college students.

The benefits of the proposal include better-prepared students to enter college, to enter the workforce or to pursue advanced degrees and the chance for the university to recruit more students into the pipeline of science and engineering students. The faculty will benefit from participation in the program in which research opportunities will be available where funding can be attracted to the university to train more students and thus increase the number of minorities prepared for the workforce.

It is anticipated that in addition to approximately sixty high school students who will participate in the CI Summer Institutes during the grant period, there will be other students who will be exposed to the CI community through curricular changes in the high schools and effective recruiting by participating teachers. Assuming a five-fold multiplier effect in the number of high school student participants, it is the goal of the proposal to have at least three hundred (300) high school students exposed to CI by the end of the project period in addition to a number of undergraduate students who participate in the program at the college level. All students in the CI exercise will be tracked during the project period and beyond in order to better assess the effectiveness of the program in achieving the goal of increasing the pipeline of students who pursue academic training in STEM disciplines.

**P120A080054**

**University of Puerto Rico – Aquadilla, PR**

**Grant Type: Institutional**

### **ABSTRACT**

University of Puerto Rico – Aquadilla (UPRAq) proposes to increase the number of STEM degrees granted annually from the present 106 to 130, equal to a 25 percent increase in a three-year period. In order to accomplish the goal, two main objectives have been established: (1) to increase the CEEB math scores and thus their retention and graduation potential of students in STEM fields by 8 percent, from 532 to 575, as well as, provide them with additional tools for academic success before admission to the university; and (2) to increase the retention rate, in their chosen major, of students admitted to STEM fields by 25 percent, from 13 percent to 38 percent, while reducing the time to graduation from the current six years to five years.

We expect to reach the above mentioned objectives through the following activities: first, an outreach component, where high school students from 10th and 11th grade will be invited to participate in a six-week, 24 workshop, program “Priming the Pre-University Candidate: Readiness for College.” They will see first-hand the STEM facilities at the university e.g., laboratories, and will participate in workshops on scientific methods, basic research techniques, and College Entrance Examination Board (CEEB) test preparation. They will also complete a science project to be presented in a symposium at university level. Students will also present their work in the science fair at their respective schools. Students from the outreach program will be given follow-up upon admission to UPR-Ag in their respective STEM fields through two workshop-seminars offered by liaison professors during the semester.

Next, we propose The “Mentoring-Based Student Support Program” this program seeks to help university students develop and enhance a sense of identity, to become effectively integrated into the school, relate productively with the faculty, and feel a sense of belonging and have a sense of purpose about being at the university and pursuing their particular program of study. In addition, the mentor will help the student acquire the necessary skills to become an independent and life-long learner.

Finally, we propose the Faculty Development Program to assist the faculty in learning about and adapting to proven new pedagogical techniques in STEM teaching, and in using technology-based resources, such as modules and materials available on the Internet. The faculty component, “In-Campus Development: Mentoring and Enrichment of the Academic Experience,” will take place in summer workshops, conferences, and short courses using outstanding local and off-island scientists with special experience in effective teaching.

Assessment will include process evaluation to determine how effectively the plan of operation was followed and how effectively it responded to unforeseen events and feedback from formative evaluation. We will also collect and verify data on participation in program activities i.e., the number of research projects presented. Most of the same assessment strategies will be used for both formative and summative evaluation. The principal difference will be in when the evaluation activities take place and how the results (data) are treated. Quantitative evaluation will be used to assess the number of high potential students who apply to the UPRAg or other universities in STEM fields in several ways: the math portion of the CEEB of students applying, the number of students participating in the Summer Outreach Program applying in STEM fields, the number of Summer Outreach and Bridge Program participants admitted in STEM fields, the number of students applying for admission and the number admitted) who are credited with Pre-Calculus at entrance, all compared with previous years.

**P120A080103**  
**Savannah State University, GA**  
**Grant Type: Institutional**

### **ABSTRACT**

Savannah State University (SSU), an HBCU located in Southeast Coastal Georgia, has a historical mission of serving underrepresented groups and economically disadvantaged students in the state of Georgia and rural South Carolina low country. SSU has identified problems inhibiting significant enrollment and graduation in engineering technology among the populations it serves and that any effort to strengthen its engineering technology programs must first address the enrollment and retention problems. SSU has further determined that these problems can be overcome if it would pull its resources together and implement exacting activities to recruit, remediate (where necessary) and retain students through graduation in engineering and technology.

SSU proposes the Expanding Minorities' Access to Improved Engineering Technology Education (EMAIETE) in Georgia and the South Carolina low country initiative, which will expand access to engineering technology education for minority students (including women) in our service area. The proposed project will create diverse pathways to engineering technology education that will result in an increase in the number of minority students enrolled and graduating in this field at the baccalaureate degree level at Savannah State University. Project activities will focus on the improvement of science, technology, engineering, and math (STEM) education delivery with an emphasis on engineering technology. Activities, which will attract and retain minority students with varying backgrounds and entry abilities and avail them of the opportunity to receive high quality STEM education, will be implemented.



**P120A080030**  
**Fort Peck Community College, MT**  
**Grant Type: Institutional**

## **ABSTRACT**

The FALCON Project purpose is to double the number of American Indian students who major in and earn an associate of science degree in STEM fields at Fort Peck Community College (FPCC) in three years, through improved science and math learning effectiveness in pre-college science, technology, engineering, and mathematics (STEM) core courses in four high schools and the tribal college serving Assiniboine and Sioux students. Curriculum articulation, alignment and development programs will couple with STEM faculty development opportunities, curriculum enhancement, bridge programs and mentor coaching to integrate “Active and Problem-Based Learning” to improve pre-college STEM achievement levels and build a seamless pathway to college STEM associate degrees and STEM careers for American Indian students.

**Objective 1:** In year one, The FALCON Project will align forty mathematics, biology and chemistry curricula in the four Consortium schools and FPCC, with the college level STEM entry expectations, resulting in a published Fort Peck STEM Articulation Guide;

**Objective 2:** In year one, The FALCON Project will support professional development for ten Consortium STEM faculty in “Active and Problem Based Learning” pedagogy; and enhance and expand curricula for ten high school mathematics, biology and chemistry courses and seven pre-college STEM courses at FPCC.

**Objective 3:** In years two and three, The FALCON Project will implement “Active and Problem-based Learning” in the reservation high schools and the FPCC pre-college STEM curricula, including Mentor/Coaches for team learning and supplemental instruction; and Summer Bridge Academies in math and science for pre-college American Indian students that feature “Active and Problem-based Learning” experiences.

**Objective 4:** In years two and three, The FALCON Project will implement an assessment and evaluation program to improve the project service and measure American Indian student STEM learning achievement and progress in all STEM courses and academy learning activities.

**FALCON Project Leadership:** The FALCON STEM Team will lead and direct the active learning faculty development and curriculum enhancement in STEM classrooms bridge academies.

**P120A080039**  
**Martin University, IN**  
**Grant Type: Institutional**

## **ABSTRACT**

Indianapolis, the 12<sup>th</sup> largest city in the United States, is known as the Heartland of America, home to championship football teams, Olympic trials, and international auto racing, but the poverty in the inner city prevents most living there from participating in those events. Homelessness, sky-rocketing homicide rates, and the next-to-the-worst public school district in the country greet those of poverty, predominantly Black. Almost 8 years ago, the legislature created public charter schools to try to counteract this dire data, but today pupil failure, especially in the science and math disciplines, continues even in the charter schools.

In this proposal, Martin University will provide the development of pre-college, K-12, enrichment activities in science, technology, engineering, and mathematics (STEM) to increase the pipeline of minorities, especially female, entering into STEM disciplines at the University and into Graduate School.

We will partner with the Andrew J. Brown public charter school and subsequently, other charters, that are excelling in the Language Arts disciplines, but where over 95 percent of the teachers surveyed indicated a strong need for increased academic STEM content knowledge as well as teaching strategies for diverse learners to increase their pupils' high-stake test scores in science and math by 10 percent per year. With CUME as an External Evaluator and rigorous Performance Measurements, this will be accomplished through:

- (1) A Summer Teacher Intensive Training and Preparation Camp with advanced science seminars, faculty professional development workshops, and pre-college enrichment activities in science and math for the charter pupils;
- (2) Ongoing follow up and practical experience as Martin supervises Saturday School throughout the school year as the cohort of 32 teachers put into practice their new skills;
- (3) Special conferences with nationally recognized leaders in both the content areas and in strategies specifically for children of poverty, to actively engage them and make teaching/learning in the STEM areas relevant as well as rigorous; and
- (4) Service opportunities for Martin advanced STEM students--to have increased learning experiences in math/science beyond those normally available, as they work with Brown pupils in the Saturday School throughout the school year and serve as tutor/mentors for charter school pupils, with a campus visitation and science lab experiments to increase the likelihood of the charter pupils' viewing college-going and STEM careers as a possibility.

**P120A080094**  
**Florida A&M University, FL**  
**Grant Type: Institutional**

## **ABSTRACT**

Information assurance and security (IAS) is one of the fastest growing areas of the information economy, addressing concerns ranging from matters of national security to individual privacy. At Florida A&M University (FAMU), IAS has become one of the most popular tracks of study for students in the Department of Computer and Information Sciences (CIS). Students completing the IAS track receive industry recognized professional certification of IAS competency. This project seeks to strengthen the IAS program with the goal of increasing the number of minority students prepared to participate in this segment of the information economy.

The objectives of this project are (1) to increase the number of CIS graduates who are IAS-competent; (2) to increase the number of CIS graduates who are IAS-aware; (3) to develop and enhance CIS faculty capability to teach IAS topics; (4) to become Center of Academic Excellence in Information Assurance Education (CAEIAE).

These objectives will be accomplished through the following activities: (1) mapping IAS track to professional standards; (2) developing and incorporating IAS modules into CIS core and service courses; (3) establishing the IAS teaching lab to support the delivery of IAS modules; (4) training faculty to teach IAS topics; and (5) establishing the FAMU Center for Secure Computing and Information Assurance (FCSCIA) for research, outreach and service.

The expected outcomes of the project include the following: (1) 20 percent increase in students receiving IAS certificates; (2) 30 percent increase in CIS graduates pursuing IAS-related advanced degrees; (3) 20 percent increase in CIS graduates pursuing IAS-related career tracks; and (4) designation of FAMU as a CAEIAE.

**P120A080009**

**Texas A&M International University, TX**

**Grant Type: Special Projects**

## **ABSTRACT**

Texas A&M International University (TAMIU) request funds to address the critical need that exists in Laredo, Texas to develop skills and motivation in its participants, which are necessary for success in a program of postsecondary education that leads to careers in science, technology, engineering, and mathematics.

The project places special emphasis in the mastery of mathematics and sciences and will have two basic components: an academic year component, and a summer component. Both components will maintain an active curriculum comprised of mathematics, sciences, computer science, communication skills, tutorial services and counseling. Cultural events as well as social events will be an integral part of both of these components, which are part of the STEM enrichment activities. In addition to the core curriculum, the program will disseminate educational, financial aid information, and college admission forms (paper and electronic) to students and parents.

The three-year project outcome will be the preparation and motivation of 90 low-income and potential first-generation college students from underrepresented groups to complete secondary education and enter and succeed in a postsecondary education program that will lead to careers in scientific and technological fields.

**P120A080045**  
**Shaw University, NC**  
**Grant Type: Cooperative**

## **ABSTRACT**

Shaw University requests funds to address to develop curriculum, set up physics laboratory experiments for advanced physics courses, improve the problem-solving skills of minority students, and initiate a program of curriculum sharing and guest lectures in the physics area among the participating Historically Black Colleges and Universities (HBCUs). These objectives will be achieved by conducting two summer workshops for developing curriculum and laboratory manuals, developing advanced physics laboratory experiments, and computerizing at least ten experiments at each of the four institutions. MSEIP support will be used for purchase of equipment, computers, and software, release time for physics teachers, stipends for summer workshops and consultant related costs.

The anticipated outcomes of the project include: developing an advanced physics laboratory manual with twenty laboratory experiments, developing at least fifty one-hour DVDs of problem solving sessions, coordinating at least six physics and physical science courses at the participating institutions, improving physics area library holdings, starting of a guest lectures program among participating HBCUs, and presenting the results of the project at the American Association of Physics Teachers' meetings. It is estimated that at least 1,500 minority students will benefit from the cooperative physics project activities each year.

**P120A0800007**  
**El Paso Community College, TX**  
**Grant Type: Cooperative**

## **ABSTRACT**

The El Paso Community College (EPCC) and the University of Texas at El Paso (UTEP, both institutions are Hispanic-Serving Institutions located in West Texas with a combined student enrollment of over 40,000 students, request funding. to enhance the first two college level mathematics courses (PreCalculus I and II) on three campuses at EPCC with mandatory “Supplemental Instruction” provided by graduate mathematics students at UTEP. Approximately 900 students will participate in “Supplemental Instruction” in their PreCalculus courses at these three EPCC campuses annually.

The Department of Mathematical Sciences at UTEP, with the help of an MSEIP grant, is currently providing “Supplemental Instruction,” a concept originally developed by the University of Missouri-Kansas City, in all of its Calculus I classes. “Supplemental Instruction” implements collaborative active-learning strategies and is targeted at high-risk courses; it is known to increase student performance, student retention and student satisfaction with the course.

This project will continue and strengthen a tradition of close collaboration between the mathematics departments at both institutions. Both departments currently use the same pre-requisite qualifications for all of their courses; both institutions also already use identical textbooks in all of their introductory college level mathematics courses. Since more than 78 percent of the transfer students at EPCC transfer to UTEP, it is anticipated that improved student performance and satisfaction in the introductory mathematics courses taken by STEM majors will have a significant impact on minority STEM enrollment at UTEP, and will ultimately lead to a substantial increase in the number of minority students graduating in one of the science and engineering disciplines.

**P120A0800014**

**Jackson State University, MS**

**Grant Type: Institutional**

## **ABSTRACT**

Jackson State University (JSU), in partnership with Mississippi Science Partnership (MSP), and the Department of Physics, Atmospheric Sciences, and Geosciences requests funds to support the project development of an Integrated Learning and Teaching Environment (ILTE). MSP, an alliance with the vision of improving the teaching and learning of mathematics and science for years to come in the State of Mississippi, will be the implementing unit for the project. The Department offers bachelor's degrees in physics, meteorology, Earth system science and master's degree in science teaching, and provides service courses at all levels.

The ILTE project has seven major components: (i) Electronic Instruction Delivery System (EIDS); (ii) On-line course development; (iii) Curriculum Upgrade; (iv) Labs Upgrade; (v) Lab Establishment; (vi) E-portfolio development; (vii) Electronic Astronomy (ELA). In EIDS, eight classrooms in Just Hall of Science will be equipped with quality audio-visual equipment. With these classrooms equipped, instructors can plan the use of multimedia and presentations for their classes. This improvement to our classrooms will impact approximately 1,700 science, math and engineering students and many others every year.

Upgrading Physics, Meteorology, and Masters in Science Teaching curriculum, upgrading the introductory physics, physical science and advanced physics labs strengthen the curriculum, promote better resource management, meet accreditation standards, and promote specialization. Development of e-portfolio will help learning and student assessment. As part of ELA, we wish to add a few components to the state-of-the-art observatory (upgraded with a MSIEP grant funded in 2002) in order to achieve two main objectives, the enhancement of research and outreach. The observatory will enable JSU students and participants in astronomy outreach programs to engage in a competitive level of instruction and research. The astronomy outreach program will provide remote access to approximately 3,600 middle and high school students to images obtained at JSU observatory.

**P120A0800025**  
**El Paso Community College, TX**  
**Grant Type: Cooperative**

## **ABSTRACT**

El Paso Community College (EPCC) and The University of Texas at El Paso (UTEP) are key Hispanic-Serving Institutions (HSI) on the United States-Mexico border that serve 85 percent Hispanic student population in this area. This project will create a bridge for pre-freshman students enrolled in an Early College High School (ECHS), a new educational initiative in Texas.

The “three steps” in our integrated bridge program refer to a continuum from ECHS, through EPCC to UTEP to support underrepresented Hispanic, minority and female students entering interdisciplinary STEM-based bioengineering careers. The ECHS is located on EPCC’s Transmountain Campus and from its inception was designed to have a focus on science, technology, engineering, and mathematics (STEM) fields.

The overall goals of the project are: 1) to develop a bridge program with the ECHS, 2) to provide mentoring programs and experiential-based research activities designed to attract and retain minority students and women into the STEM fields, and 3) to increase the number of minority and women students graduating from high school with associate degrees who will be prepared to enter into emerging bio-engineering fields.

Integrated activities will include: Tutoring and Peer Mentors, ECHS Student Orientation, Bioengineering Seminar Series, Summer Camp, Research Projects, and Renovation of Science Laboratories to include a tabletop scanning electron microscope and add bio-imaging and 3D-holoprojection capabilities to enhance student learning. Through the implementation of the ECHS Bridge activities, other student support programs, and the offering of new major options in STEM fields at EPCC, we expect to achieve the following: 1) to graduate 80 percent of the ECHS students with a dual high school and associates degree in STEM fields within four years, 2) to impact the Transmountain campus science student population of 1,200 students through the activities of the ECHS Bridge, and 3) to increase the number of EPCC students graduating with associates degrees in STEM majors by 25 percent in three years.



**P120A0800011**  
**Mercy College, NY**  
**Grant Type: Special Project**

## **ABSTRACT**

Mercy College, a minority serving institution located in the New York metropolitan area, has developed the Mathematical Modeling at Mercy College (M<sup>3</sup>C) Program to provide talented entering tenth and eleventh grade high school students with an intensive four-week summer mathematical modeling program.

With a focus on attracting women and minorities, M<sup>3</sup>C is designed to teach mathematical modeling progressively, with an emphasis on relating projects to real-life experiences, to be accomplished through the following objectives: (1) to recruit and select 20 high-ability high school students, including a minimum of 50 percent women and/or minorities, to participate each year; (2) to enable 100 percent of participants to use the mathematical modeling process to solve problems; (3) to increase the knowledge of 90 percent of participants about educational and career opportunities in math, the sciences, and engineering; (4) to ensure that at least 80 percent of M<sup>3</sup>C alumni enroll in advanced mathematics and/or science courses at their high schools; and (5) to provide 100 percent of participants with the support, motivation, and training to enable them to pursue postsecondary education in math, science, or engineering.

Over the 36-month period, 60 students from area high schools will be recruited to participate, gaining awareness of educational and career opportunities in the sciences while preparing to pursue postsecondary education and careers in these fields. Collaborations with local science and research centers including IBM, Philips Research, and Cold Spring Harbor Lab enable the M<sup>3</sup>C program to provide high-quality field trip experiences and lecture presentations and provide participants with real-life applications of the mathematical modeling process as well as exposure to role models. Through this project, M<sup>3</sup>C will work to increase the flow of women and minorities into the fields of mathematics, the sciences, and engineering.

**P120A0800080**

**San Mateo County Community College District – Canada College**

**Grant Type: Cooperative**

## **ABSTRACT**

Student *On-Ramp Leading to Engineering and Sciences (SOLES)* Cañada College and San Francisco State University, with an existing, successful partnership in the University Center that offers four-year degrees at Cañada, are committed to increasing the representation of Hispanics, African Americans, and other minority groups in science, technology, engineering and mathematics (STEM). Cañada College (CC), a Hispanic-Serving community college in Redwood City, California, has a minority enrollment of over 50 percent, and the majority are women, at 63 percent. Though many of these students enter with high levels of interest in science and engineering, their levels of preparation for college-level work, especially in STEM fields, are so low that the majority of them drop out or change majors even before taking transfer-level STEM courses. As a result, retention and success rates among minority students are unacceptable, with a one-year persistence rate averaging less than 60 percent and a two-year persistence rate averaging less than 30 percent.

San Francisco State University (SFSU), a public university, enrolls 23,074 undergraduates, and is also a multicultural institution. It is the most accessible and diverse four-year university within reach of CC's campus, yet few students, and even fewer minority students, transfer from CC to SFSU into the STEM fields. Those who transfer, struggle with timely graduation.

The SOLES project aims to maximize the likelihood of success among underrepresented and educationally disadvantaged students interested in pursuing careers in STEM fields through a combination of programs and services proven to increase recruitment, retention and success. The SOLES project has been designed with five essential strategies:

1. The *Summer Mathematics Bridge Program*: a six-week intensive mathematics program designed to improve students' preparation for college-level math courses.
2. The *Summer Engineering Institute*: a two-week residential summer camp at SFSU that will provide real-world context to the study of engineering through practical, meaningful, applied and hands-on problem-solving and design-oriented projects.
3. A student-centered model of *Academic Counseling and Mentoring* that involves support structure provided by a knowledgeable academic Counselor, supportive faculty advisors, and peer mentors.
4. A series of *Personal and Professional Development* activities designed to develop knowledge and attributes needed to be a successful STEM student.
5. Strong *Academic Support Services* through student clustering in key STEM courses, Academic Excellence Workshops (AEWs), and tutoring.

The *SOLES* project is designed to improve the interest, persistence and performance of underrepresented minority students, especially women in STEM fields. It will allow poorly prepared students accelerated entrance into the field, delivers academic, personal and professional development opportunities, and provides real-world context to their studies to help maintain motivation. Using a rigorous evaluation plan, the model project will meet federal guidelines. At the end of the project, many components will be institutionalized.