

Curriculum Improvement Partnership Awards (CIPA)

PERFORMANCE OUTCOMES DATA SUMMARY

Narratives Only

FISCAL YEAR 2007

**Compiled by
NASA Research & Education Support Services**

Narratives

CIPA

Tougaloo College

Tougaloo, MS 39174

Dr. Santanu Banerjee
601-977-7789

PROGRAM DESCRIPTION

The Tougaloo College CIPA II program is developed to modify the Tougaloo College curriculum to address the nationwide shortage of African American students in the STEM related disciplines. Addressing this deficit will also increase the pipeline of students going into the NASA related fields. The course offerings at Tougaloo College will be improved by incorporating pedagogy to address different learning styles and integrate technology into curricula to enhance the content area. The curriculum will also be enhanced to include more real life skills and experiences within the curriculum and providing access to skilled professionals, a large array of learning materials, understanding of project management skills, and field trips to NASA related (or industry) facilities. The CIPA II faculty will also acquire additional skills and training in project management, which can then be imparted to the students. With this project, the Tougaloo College core science curriculum will be enhanced by incorporating various content, pedagogy, technology, mentoring, and project management skills.

The goals of the Tougaloo College CIPA II project are described in a section below. The following activities will be incorporated to achieve the goals of the Tougaloo College CIPA II project, (a) A freshman level, two semester course titled Introduction to Space Sciences will be implemented (b) The introductory Physics curriculum will be reformed (c) A Modern Physics Laboratory course will be developed and implement, with new instrumentation (d) Retention, outreach, and mentoring activities will be initiated (e) Project Management skills and NASA resources will be integrated into different aspects of the curriculum, and (f) Collaborations with industry partners (NISSAN), NASA, UNCFSP, and other organizations will be built and strengthened.

PROGRAM RELEVANCE TO NASA

Tougaloo Colleges CIPA has much relevance to NASA as it provides important training and enhanced courses to students in STEM courses. These students will join the pipeline of future scientists with greater knowledge of scientific principles and more hands on laboratory experiences than former students. Also, they will have an understanding of project management skills which will allow them to work in any scientific field.

The students affected by this program will have greater awareness of scientific careers. They will also have opportunities to participate in classes, internships, field trips and other activities to acquire and increase knowledge necessary to succeed in NASA based activities. Therefore, NASA and other scientific entities stand to benefit from this potential pool of qualified individuals.

PROGRAM BENEFITS TO SOCIETY

Tougaloo College has a long history of preparing highly qualified African-American professionals in different fields. As a minority serving institution, Tougaloo College plays a key role in recruiting talented African-American High School students and placing them into Graduate Schools. Several successful professionals are among Tougaloo College's alumni.

In the United States, there is a shortage of African American professionals in STEM related disciplines. Through CIPA-II grant, we can provide an early exposure to exact sciences to Freshman students at Tougaloo College. Also, this project has provided students with project management techniques that will help them in their professional work or careers. In the long term, this project aims to motivate our students to pursue graduate studies in Physics, Math, Biology or Chemistry.

One immediate impact of this project is the awareness of NASA-related disciplines to both High School and undergraduate students from minority institutions. Also, the dissemination of project management techniques among our students will make them more competitive in the job market. Finally, following the principle of equality in our society, it is important to prepare and place underrepresented minorities in NASA-related carriers.

PROGRAM GOALS

The goals of the Tougaloo College CIPA II project are as follows:

- Increase enrollment of minority students who major in the NASA related sciences (Physics, Pre-engineering, Mathematics & Computer Science, Chemistry, and Biology)
- Course development to improve the success of science majors and increase enrollment in the sciences.
- Prepare students with project management skills necessary to succeed in industry and other professional fields.
- Provide an environment and curriculum that will buttress a students ability to be accepted by graduate programs and to be successful beyond graduate school.
- Provide supplemental support services to improve academic success rate of those who major in the physical sciences.
- Develop an interdisciplinary experience for students who plan to

- major in the sciences.
- Provide faculty development in project management.

PROGRAM ACCOMPLISHMENTS

Following are the Program accomplishments for the Tougaloo College CIPA II Program for the time period October 2005- October 2006

1. Continuation of two new interdisciplinary team taught courses in Space Science and enhancement of the introductory Physics classes. The new space science courses were initiated, developed, included in the curriculum / catalog and implemented from Fall 2006 semester, and has continued to be offered every semester since (part 1 in Fall and part 2 in Spring). The introduction to Physics course has been enhanced since Fall 2006 and substantially restructured in Fall 2007. In addition to restructuring the class hours to integrate the lab and lecture components more effectively, the Physics course has added a tutoring component to the course. The class is much more interactive in nature and various tools coming out of Physics education research has been implemented. The course has been assessed through a standardized Force Concept Inventory test, and the percent gain (between pre and post test) observed in conceptual understanding has been substantially higher, compared to previous years.
2. Introducing field trips to NASA Stennis Center, the Jackson Planetarium and the NISSAN Canton Plant as part of the curriculum.
3. Project management training received by CIPA II faculty, and introduction of project management into the Tougaloo College STEM courses related to CIPA 2.
4. Enhanced course instruction through acquisition and implementation of technology resources which have shown to create a learning centered experience.
5. Dissemination of project information locally and nationwide through presentations. Posters about the Tougaloo College CIPA 2 project was presented at the Project Kaleidoscope Faculty for the 21st Century national assembly in 2006 (about 180 faculty participants), and the American Association of Physics Teachers New Faculty Workshop Reunion (about 50 University/College Physics faculty). Oral presentations were delivered for the CIPA IR workshop, NAFP/JFPF/CIPA Symposium, and an invited talk was given at Jackson State University. Tougaloo College CIPA 2 project was also disseminated in multiple Tougaloo College events. In every

dissemination event, the PI acknowledged and highlighted the CIPA 2 Program, UNCFSP, and NASA.

6. Providing one on one e-mentoring access to Tougaloo College students through mentornet. The mentoring is provided to STEM students by STEM professionals through Mentornet.
7. Partnerships developed with UNCFSP, NASA, NISSAN, and Mentornet and a MOU developed between NISSAN and Tougaloo College (for internships, field trips, and Project Management training).
8. Four CIPA 2 faculty made presentations on 'how to succeed in science' and career opportunities to 54 High School students representing about 30 High Schools.
9. Two CIPA 2 faculty and two students attended the NAFP/JFPF/CIPA symposium in Cleveland, July 2007.

STUDENT ACCOMPLISHMENTS

The NASA CIPA2 program has been an excellent opportunity for our students to enhance their knowledge and explore the wonders of space science, including space exploration.

They were able to see first hand the wonders of space and the practical aspects in Space Programs from field trips sponsored by this program. The students have also been exposed to fundamental project management terminology and skills through this program.

The students experienced a multidisciplinary team approach in Space Science course, which is an approach that gaining presence in graduate schools. Further, the students gained valuable experience in the team teaching approach. Many of their assignments were group assignments and many experiments were carried out in groups. The students also had the opportunity of being exposed to Physics in their freshman year, instead of the Junior Year at the earliest. Through the Space Science course the students also had the opportunity to see the inter-related nature of the different fields of science.

The enhanced introduction to Physics course created a much more learner centered and active environment to learn Physics. The course development is also consistent with the progress made in technology, to teach the course more effectively, and create a student with better conceptual understanding and technical competency in STEM through the Physics course.

Student internship at NISSAN and faculty-student research experience

provided the students with additional skills necessary to succeed in professional or academic disciplines. The leveraged funding through the NASA EPSCoR fund provided training to students and faculty in Geographical Information System, which is a NASA related STEM field.

Since more than 99% of Tougaloo College students are African American, all of the student achievements are by minority students in STEM areas. The minority students are grossly underrepresented in these areas.

PICTURES (6 images)

CIPA

West Los Angeles College

Culver City, CA 90230

The Math Success Project

Dr. Bonnie Blustein
310-287-4217

PROGRAM DESCRIPTION

N/A

PROGRAM RELEVANCE TO NASA

N/A

PROGRAM BENEFITS TO SOCIETY

N/A

PROGRAM GOALS

N/A

PROGRAM ACCOMPLISHMENTS

The relationship with Dorsey High School has been strengthened. We have continued to hold "Dorsey Days" at West LA College two years after the grant funding expired. "Dorsey Day 2007" was themed on "Technology." We are seeking funds to continue this program. Program Director William Brian Harris is now teaching mathematics for the Los Angeles Urban League.

STUDENT ACCOMPLISHMENTS

- Alfredo Martinez graduated Cal State Long Beach in June 2007 in Engineering and is presently in a Masters program there.
- Carlos Saa-Recalde graduated Cal State Northridge in May 2007 in Physics and is presently in a Masters program. We have referred them to the Harriette Jenkins Program.
- Iris Lucero transferred to UCLA and is serving as a college liaison for UCLA at West LA College.
- Andre Besada transferred to UCLA where he is in a pre-medical program.
- Al Dawoud transferred to UCLA in Engineering and expects to graduate in June 2008.
- David Apodaca transferred to UC-Berkeley in computer science.
- Barrington Bailey transferred to the Drew Medical School in nursing.

The following other students have transferred in other areas:

- Marcella King, UCLA
- Stacy McCarter, Humboldt State University
- Susana Benton, Cal State Northridge
- Melissa Villega-Ermert, Cal State Dominguez Hills
- Amal Ibrahim, UC Irvine
- Regina Osnaya, University of Phoenix
- Rodney Gaylor, UCLA

PICTURES (none)

CIPA

Santa Monica College

Santa Monica, CA 90405

Dr. Jinan Darwiche
310-434-8662

PROGRAM DESCRIPTION

The Program, housed in the Computer Science and Information Systems department at Santa Monica College, aims at developing curriculum in the areas of Networks, Robotics and AI, and Project Management. It is focused on helping under-represented students achieve better education and eventually employment by offering scholarships and reaching out for high school students.

PROGRAM RELEVANCE TO NASA

Overall, the fields of Robotics and Network Security are underlying needs of many different industries that work together to support the research and development efforts of NASA and its contractors. Robotics technology will be used to design, build, carry out, maintain, and repair NASA-initiated studies and operations, while network security professionals will protect the integrity of these operations, including the methodology used, the outcomes identified, and the subsequent implications. Without professionals trained in each of these areas, NASA and others that support NASA-driven operations will face numerous challenges and barriers in achieving local, regional, and national goals and objectives.

In addition to providing students with the technical skills that they need to carry out the goals, objectives, and tasks of the respective industries, the proposed curricular enhancements will foster an understanding of the importance of project management skills among field technicians. If students learn the technical skills at the same time that they are learning how to manage projects, they will develop an appreciation of the value of knowing both skill sets, which can be hard to instill once an individual is already an expert in the field.

PROGRAM BENEFITS TO SOCIETY

As a community college, SMC is interested in offering instructional programs that directly support local business and industry. The Computer Science and Information Systems Department, with input from its advisory board, has identified Robotics and Network Security as high demand fields that will address both the academic transfer and occupational and technical goals of the college. The program will support the development of these programs so that students may earn a terminal degree or certificate in either field and

enter the workforce upon graduation. The college's partnerships with local business and industry will help ensure that graduates find employment after graduation. However, the college will also work with its four year partner to ensure that the programs are accepted for transfer by the CSU system. To the extent possible, SMC faculty will encourage students to transfer so as to increase their career options.

PROGRAM GOALS

The following is a summary of the program goals:

1. Develop curriculum in the areas of Networks, Robotics and AI, and Project Management, through courses and degrees.
2. Offer aid to minority students to assist them to further their education.
3. Create high-school outreach programs to encourage students at an early stage to enter into the program.
4. Develop partnerships with industries to assist program graduates find relevant employment.
5. Develop partnerships with four-year academic institutions to encourage student obtain higher education degrees.

PROGRAM ACCOMPLISHMENTS

So far, the program is in the beginning of its second year. Here is a summary of its accomplishments:

1. We have assisted students in program areas by offering them scholarships as a means of financial aid to further their education.
2. Our program has also offered summer outreach programs to attract high school students into these fields. These summer programs end with a field trip to NASA JPL, which proved to be a true inspiration to the young minds.
3. We have developed a number of courses and certificates in Project Management that we believe will aid students in managing and planning their time effectively to produce quality work. We have also enhanced several of the department courses to include Project Management curriculum, so that students will be more encouraged to study this field further.
4. In addition, a number of courses and certificates have also been developed in Networks, and Robotics and AI as part of the curriculum development process of the program.
5. Finally we have established a tutoring center that has proved to improve student retention rates.

STUDENT ACCOMPLISHMENTS

The program has not completed all its goals, but a number of students are working on projects as part of their training in order to complete some of the program certificates. The program has also placed a number of students in

NASA internships.

PICTURES (2 images)

CIPA

Haskell Indian Nations University

Lawrence, KS 66046

Dr. LouEdith Hara
785-749-8402l

PROGRAM DESCRIPTION

Integrate project management into courses that support the environmental science curriculum at Haskell Indian Nations University. We will incorporate project management concepts and methodologies blended with management theory and real-world applications within three courses offered at Haskell.

PROGRAM RELEVANCE TO NASA

The program incorporates and exposes students to NASA technology and data thus improving the chances of attracting Native American students to pursue careers in NASA/aerospace industries.

PROGRAM BENEFITS TO SOCIETY

Many of Haskell's students come from reservations and they return to their reservations to work. As college graduates in often economically depressed regions of the country, Haskell graduates are often the most highly educated people on the reservation and they quickly enter leadership positions with responsibility for developing and managing projects. Tribal lands comprise approximately 3% of the landmass in the 48 contiguous United States. It is important to incorporate management skills and utilization of NASA-derived technologies into tribal-land management

PROGRAM GOALS

The goal for the project is to integrate project management into courses that support the environmental science curriculum at Haskell Indian Nations University. This narrower focus is for Haskell students to specialize in GIS with project management concepts and methodologies applicable to GIS projects.

PROGRAM ACCOMPLISHMENTS

CIPA II at Haskell has developed a template for the GIS courses. This template is useful for the various teams to be able to refer to when working through a project for the CReSIS, or TCUP grants at Haskell. The students involved in these projects will have some knowledge about the methodology of project management.

The campus is aware of the use of project management and would like to have some type of training that would fit the needs of the various federal

employees on campus. So the CIPA II grant has brought the awareness of the project management concepts and terminology to the campus.

STUDENT ACCOMPLISHMENTS

The students who worked with the grant projects (CReSIS and TCUP) realized this concept could help them be efficient with meeting with their goals and deadlines. One of the projects was completed on time and had a well polished product. The other project needed additional discussion and planning. The PERT charts were used so all could visually see the deadlines and bottlenecks of the project. Upon presenting the product at the NASA/UNCFSP symposium, the groups had submitted an article on the project management techniques with the GIS to ESRI and are waiting on a decision.

PICTURES (3 images)

CIPA

Community College of Denver

Denver, CO 80217

Dr. Jean Hindie
303-556-3816

PROGRAM DESCRIPTION

The first objective of the program is to introduce project management principles into the STEM classes at the Community College of Denver (CCD). The second objective is to create an Associate of Science degree in pre-aerospace engineering technology that will allow students to transfer to Metro State Collage of Denver (MSCD) and earn a Bachelor degree in Aerospace engineering technology.

PROGRAM RELEVANCE TO NASA

Students graduating from this program will be prepared to work in the aerospace field. With the project management training, graduates will have a greater opportunity to further their careers.

PROGRAM BENEFITS TO SOCIETY

This program will help to train the next generation of aerospace workers. It will create a highly qualified and diverse group that will serve the need of society.

PROGRAM GOALS

To strengthen the math curriculum at CCD an HSI institute and to improve participation of CCD minority students in math and science majors.

PROGRAM ACCOMPLISHMENTS

In 2007 the curriculum for the Pre-Aerospace Engineering Technology degree at the Community College of Denver (CCD) was completed. Five new classes were approved and added to CCD's catalog.

CCD enhanced its calculus curriculum by adding a group project to its Calculus II class.

With money from the grant thirty two math and science textbooks were purchased and donated to the students' book lending library; two scholarships were established and awarded; and an internship program for six students with Lockheed Martin was created.

For the second year the summer ACES Scholar program was offered. This three-week intensive math and engineering program for high school students

helps minority students prepare for entry level college STEM courses.

STUDENT ACCOMPLISHMENTS

CCD students in Calculus I are using project management principles to complete their group projects. P.M principles have also been used by students in the chemistry and physics classes.

PICTURES (2 images)

CIPA

East Mississippi Community College

Scooba, MS 39358

Dr. Jairus Johnson
662-476-5300

PROGRAM DESCRIPTION

The Project Management Applications Resource System (Project MARS) is a partnership between EMCC, secondary institutions, Mississippi State University, and industry that will enhance curricula in aerospace-related disciplines by including project management modules into existing coursework, exposing students to careers in aerospace, and utilizing capstone portfolios that will represent the culmination of students work on an industry specific project from high school to employment. Project MARS will improve the capacity of EMCC to deliver high quality STEM and technology courses related to aerospace, increase the number of secondary and postsecondary students taking STEM courses, and increase the pool of qualified applicants for aerospace careers through an emphasis on project management. The mission of Project MARS will be to produce students in STEM majors and technology programs, who will have an understanding of resource management, be able to apply quality assurance concepts and strategies, and support administrative and financial project closure. Potential employers will benefit from employees who bring real-world experience into industry. Project MARS is predicated on teamwork by connecting high school students, college students, university partners, and industry.

Project MARS is a pipeline from high schools to universities and industry. The steps involved in Project MARS to increase the number of students majoring in aerospace disciplines in universities and in gaining employment in aerospace industries are as follows:

- Through the input of NASA and local industries, online project modules will be developed that can be readily incorporated into existing secondary and postsecondary curricula.
- A project management course for secondary and postsecondary faculty will be developed that teaches them how to utilize the project modules in their classrooms.
- Needed technology, equipment, and supplies by high schools and EMCC will be provided to participate in projects cooperatively through distance learning technologies.

- Project MARS Portfolios will serve as a capstone project for students.

PROGRAM RELEVANCE TO NASA

Project MARS is designed to meet NASA needs by providing a more qualified workforce that can support the needs of NASA subcontractors. By introducing project management into the curriculum, NASA and NASA subcontractors will have more minority applicants who understand the importance of working on teams to manage and participate in projects that are on-time, on-budget, and that produce the highest quality results.

PROGRAM BENEFITS TO SOCIETY

The biggest benefit to society from Project MARS is the provision of access to NASA and NASA subcontractors to inspire young minds. Students in secondary and community colleges who reside in economically disadvantaged areas are not likely to consider NASA as a potential future career option. By exposing them to NASA opportunities and real-world NASA projects, students and their parents become aware of the role that they can play in events that reach beyond their world, literally.

PROGRAM GOALS

The specific goals of Project MARS are as follows:

- Goal 1: Project MARS will strengthen the curricula in academic fields and technical programs directly related to the NASA mission at EMCC.
- Goal 2: Project MARS will improve the quantity and quality of NASA-related mathematics, science, engineering, and technology curricula at EMCC.
- Goal 3: Project MARS will increase the number of minority students on the secondary and community college level that study mathematics, science, engineering, and technology and that choose careers in NASA-related fields.
- Goal 4: Project MARS will develop students' skill sets and competence in applied science and engineering by providing enhanced curricula (minors, majors, and/or certifications) that provide or incorporate capstone portfolios for courses emphasizing project management.
- Goal 5: Project MARS will develop the capacity of EMCC to successfully leverage and sustain programs by increasing networking among CIPA II grantees to maximize current and future

grant impact.

PROGRAM ACCOMPLISHMENTS

Project MARS has resulted in in-service training for approximately 200 educators at the postsecondary level. The technology infrastructure is also in place to begin introducing the newly developed curriculum materials to the participating high school and community college programs. The most significant accomplishment has been the embedding of project management techniques into the daily operations of East Mississippi Community College. EMCC has hired a full-time project manager, weekly project reports are submitted from the lowest levels of the institutions up to the President of the college, and EMCC has been highlighted on the NASA website along with United Negro College Fund Special Programs Corporation. Project MARS has also been leveraged for \$300,000 in funding from the Department of Education's Minority Science and Engineering Improvement Program through Title 3 Part E to fund a three-year Virtual Weather College in partnership between EMCC and Mississippi State University.

STUDENT ACCOMPLISHMENTS

Project MARS has resulted in over 100 students being exposed to NASA and STEM related fields. Students were exposed to a variety of career awareness activities, primarily through field trips that were conducted during camps. The students visited CAVS Lab, Stennis Space Center, and MS Museum of Natural History.

PICTURES (none)

CIPA

Atlanta Metropolitan College

Atlanta, GA 30310

Dr. Barbara Morgan
404-756-4025

PROGRAM DESCRIPTION

The Atlanta Metropolitan College CIPA II Systemic Partnership Award for Curriculum Enhancement (SPACE) seeks to increase the number of under-represented minority students successfully pursuing and subsequently completing STEM and NASA-related courses and/or programs of study with project-management/project-based instructional components. The AMC-CIPA II SPACE Project also seeks to better prepare participants at various levels in our educational/career pipeline by reaching out to STEM students while strengthening the College's curricular offerings through academically enriching activities, modified courses and programs. The Project includes linked activities with participating partners from industry, government and senior colleges and universities that offer advanced training in STEM disciplines.

CIPA-II Project activities are extended to include Atlanta Job Corps participants, high school students and AMC undergraduate students. Through the CIPA II Project, we have implemented a number of initiatives that address UNCF/NASA mandates.

These initiatives include:

1. Curriculum (e.g., course, program and instructional) development
2. Faculty training.
3. Recruitment and retention of STEM students.
4. Facilitating student entry into both undergraduate and baccalaureate programs.
5. Counseling and mentoring pre-college and undergraduate students.
6. Preliminary education to better prepare students for STEM baccalaureate programs.
7. The subsequent development of a more diverse and competitive applicant pool for STEM and NASA- related fields.

An exhaustive internal and external review of STEM courses and programs of study at AMC was completed. The curriculum review initiative was designed to ensure that our courses and programs are in line with those of comparable institutions with respect to content, pedagogy, and to subsequently facilitate the successful transfer of STEM students to senior colleges and universities.

PROGRAM RELEVANCE TO NASA

Existing programs of study and courses were enhanced to include project management methodologies and NASA related careers and curricular concerns. Proposals for new courses and programs that address NASA related careers and concerns have been submitted for approval and addition to the math, science, engineering and computer science curricula. Graduates from AMC and the institutions to which they transfer will contribute to the pool of qualified applicants that NASA will continue to seek as the workforce becomes more diverse.

PROGRAM BENEFITS TO SOCIETY

The impact of the AMC CIPA II Project extends far beyond the bounds of the campus. Both the curriculum review and recruitment and retention elements in the grant address USG as well as institutional goals and initiatives. Since the formal, periodic review of courses and programs is mandated by the USG, the CIPA Grant has provided the impetus and resources needed to develop a model of curriculum review that can be used campus-wide.

Similarly, recruitment and retention are focal points in the relatively new leadership at both the university system and college levels. Two year colleges such as AMC have been formally identified as points of access for the nearly 100,000 new students that are expected to enroll in USG institutions in the near future. The CIPA II Project is a vehicle for making strides in this area. The summer academy, in particular, has brought a cohort of academically talented young students to the campus, most of who are also interested in participating in the AMC joint enrollment program beginning the fall term 2007.

The partnerships established via the CIPA II Grant have been of tremendous benefit to the college and partners alike. While our partners have brought resources and expertise to grant activities, their interactions with grant and other project personnel have also been of benefit. The Atlanta Job Corps Center, for example, hosted their June 2007 graduation activities on the AMC campus. Previous partnership relationships with the center have been rekindled through the involvement of the Center Director, Deputy Director and other staff members as SPACE Partners. Thus our relationship and impact can be quite accurately described as both mutualistic and synergistic. The CIPA II Grant, in short, has served as a rally point, in the institution's efforts to link itself with the community, our service area in particular.

First and foremost, the students who complete new and modified curricular offerings will be better prepared to meet the challenges that our nation faces (now and in the future) with respect to science, mathematics and technology.

They will be better prepared to contribute to NASA's Mission which ultimately impacts the well-being of the global society.

PROGRAM GOALS

The goals of the AMC CIPA II SPACE Project are:

1. To review and subsequently strengthen the curricula for Science (Biology, Chemistry and Physics), Mathematics, Pre-Engineering and Computer Science at AMC.
2. To improve the quantity and quality of NASA related mathematics, science, engineering and technology programs and courses with the inclusion of project-based/project management components in selected courses.
3. To increase the number of minority students in the pre-collegiate and collegiate levels enrolled in STEM courses and programs with project-management components and who ultimately choose careers in STEM and NASA related fields.
4. To create and implement a framework for networking and sharing resources with other CIPA Grantees and Partners.

PROGRAM ACCOMPLISHMENTS

A comprehensive review of STEM curricula including internal and external review components was completed in year two of the grant. As a result of the curriculum review seven curriculum initiatives (e.g. new course and program proposals) have been developed and submitted for review and approval.

The fact that courses (eg., BIOL 2246, CHEM 2246, PHYS 2246, CSCI 1135, and ENGR 2201) have already been modified to include PM concepts and software provides evidence that the NASA Project elements are institutionalized at AMC. Further the CO-PI has completed two Project Management courses to ensure a continuation of project management infusion into the curriculum. Additionally the NASA Project sponsored a project management/Project 2003 workshop for AMC Faculty at large during the fall 2007 term. Nine faculty and staff members participated in this inservice (staff development) training activity.

Of even greater significance is the commitment to increase enrollment in STEM disciplines. The NSM Division is committed to actively pursuing funding to continue the recruitment and retention of STEM students. Specifically, the division has successfully obtained funding to implement a Mathematics, Engineering and Science Achievement (MESA) STEM Program (Spring 2008). This additional funding will allow the college to continue various aspects of the NASA project beyond year three funding.

STUDENT ACCOMPLISHMENTS

Four NASA Scholars have completed the requirements for the Associates Degree at AMC and have transferred to senior colleges or universities. Devin Philphot is a second year student at Morehouse College majoring in Biology. John Okolo has transferred to Columbus State University. Temesha Means is enrolled at Southern Polytechnic Stat University as a Computer Science major and Madje Anaikou is pursuing a degree in aeronautical engineering at Georgia Tech.

PICTURES (6 images)

CIPA

Hartnell College

Salinas, CA 93901

Dr. Pimol Moth
831-755-6893

PROGRAM DESCRIPTION

The Hartnell College Engineering Program Upgrade with Project Management project is designed to enhance engineering education at Hartnell to better serve a large population of Latino and other minority students. The major activities in the project are: updating the college's current introductory engineering course; developing curriculum for a new special projects engineering course; development of special projects and internship opportunities for students at partner institutions; funding for new engineering laboratory equipment; and a better trained, and qualified science, technology, engineering, and mathematics (STEM) faculty. Student-centered learning is an essential ingredient in this project and will allow students to gain experience on all aspects of an engineering project applied to real world situations. Due to the interdisciplinary nature of our strong partnership relationships, the tie between Astronomy and Engineering is a recurring theme throughout all of the project's efforts.

PROGRAM RELEVANCE TO NASA

This project is relevant to NASA because it gives the agency access to a large, untapped population of Latino and other minority students who are eager to learn and succeed in science and related fields if given the opportunity. In addition, NASA materials and content related to project management and the agency's projects and strategic enterprises have been incorporated into the revised engineering courses, special projects courses and our intern training program.

PROGRAM BENEFITS TO SOCIETY

Hartnell College is located in Salinas, California, a central coast town known for its agricultural productivity and its large Hispanic population. Hartnell is ideally positioned to connect to this population which is largely underrepresented in the scientific, mathematical, and engineering professions. This project is of benefit to society because it enhances Hartnell's ability to offer a rich education in science, technology, engineering, and mathematics (STEM) courses and to provide compelling undergraduate research experiences which have been shown to result in significant improvements in student retention and promotion in the STEM disciplines, and ultimately, increased representation for this population in STEM careers.

PROGRAM GOALS

The goals of the Hartnell project include: upgrade and expand engineering offerings so that they correspond with NASA's needs and articulate with four-year engineering degrees; identify and create special projects, internships, and capstones with partner institutions; support faculty development; correspond with upgrades and improvements in Hartnell's other STEM programs; and development of programs to improve minority student enrollment, persistence, retention, and transfer.

PROGRAM ACCOMPLISHMENTS

1. Our most significant accomplishment in 2007 was the development of our Project Management Institute. The Project Management Institute (PMI) for Hartnell STEM Interns is a training program aimed at infusing Project Management into early research experiences for STEM students at Hartnell College. Students who receive internships from the NASA-CIPA II partners participate in the PMI as a part of their internship experience and must write and execute a project plan for their internship. The PMI consisted of the following three phases of student participation: The Orientation Workshop was held on June 5, 2007 and served to introduce the interns to the principles of Project Management and orient them to the overall structure of the PMI. The PMI Reflective Research Discussions consisted of weekly web-based discussion exchanges by the interns throughout the summer. The PMI Research Symposium was held on September 7, 2007 and served as a venue for the summer cohort of Hartnell STEM interns to present their work in a professional manner to each other and to representatives from Hartnell College, grant funding representatives, local media and industry and associated research institutions.
2. In summer of 2007 we placed 11 Hartnell STEM students in the following internship programs:
 - Center for Adaptive Optics
 - Naval Postgraduate School
 - Monterey Bay Aquarium Research Institute
 - Fremont Peak Observatory Association
 - Marine Advanced Technology Education (MATE) Center
3. Three engineering courses have been formally revised to include project management training modules. Engineering 1 Introduction to Engineering was offered in Fall 2007. Engineering 2 Engineering Graphics/CAD will be offered in Spring 2008. In addition, Computer Science and Information Systems 4 Introduction to Scientific and Engineering Programming will be offered in Spring 2008 with a new MatLab module.

4. Students participated in four other projects supported by the NASA grant, all of which helped introduce students to STEM careers. In Spring 2007 10 Hartnell engineering students formed a team and placed second in a MATE Remotely Operated Vehicle (ROV) competition. Also in Spring 2007 Hartnell engineering students participated in two extended field trips. On the first trip eleven students visited a number of engineering research facilities, including Aerovironment, Inc. in southern California, the U.S. Air Force Test Pilot School at Edwards Air Force Base, and the Cal Poly San Luis Obispo School of Engineering. On the second trip eleven students participated in the Aeronomy of Ice in the Mesosphere Launch Conference at Vandenberg Air Force Base in California. Finally, eight Hartnell students have formed a Physics outreach team to carry out physics outreach activities at local elementary and middle schools in Salinas, California.

STUDENT ACCOMPLISHMENTS

1. The 2007 Hartnell summer interns participated in diverse research projects, such as Micro-Electrical Mechanical Systems (MEMS), robotics, artificial intelligence, aerospace engineering, astronomy, and marine methane hydrate research.
2. The Hartnell Rocketry and Robotics Club earned 2nd place in the Remotely Operated Vehicle (ROV) competition sponsored by MATE. This group presented their project at the Baskin School Senior Design Team Symposium in June.
3. Hartnell engineering students involved in the internships or the Rocketry and Robotics Club have transferred to the following institutions: Cal Poly San Luis Obispo, UC Berkeley, UC Santa Cruz, UC Irvine, Cal Poly Pomona and Sacramento State University.
4. Continuing Hartnell student, Ricardo Fernandez, earned the NASA MUST scholarship and will be attending UC Santa Cruz in the fall to study physics and electrical engineering. He will be participating in a NASA internship at the Kennedy Space Center in summer 2008 as a part of his scholarship.

PICTURES (3 images)

CIPA

Claflin College

Orangeburg, SC 29115

Dr. Nesan Sriskanda
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PROGRAM DESCRIPTION

Name of Program: Enhancement of Analytical Reasoning, Critical Thinking and Project Management Skills of Students through Emphasis on Solving Real-World Problems in Science, Mathematics and Engineering Laboratory Courses.

The overall goals of this program are;

1. To increase students skill sets in analytical reasoning and critical thinking in the science, technology, engineering, and mathematics (STEM) related disciplines
2. To provide opportunities for under-represented STEM students to be exposed to NASA-oriented science, mathematics and research experiences.
3. To infuse the project management concepts and skills in the STEM courses through the undergraduate research program.

To accomplish these goals the following specific objectives were established;

1. Modifying the existing engineering graphics lab to be a state of art computer based laboratory and activity lab which will be able to employ hands-on exercises using interactive software systems, simulation and modeling based learning techniques.
2. Increasing the number of traditionally under-represented students to be exposed to NASA related mathematics, engineering and research.
3. Infusion of Project Management Concepts and Skills into the STEM courses.

The expected long-term outcomes are:

1. Increasing the number of students from under-represented groups in NASA related fields; a minimum of two students will choose NASA-related careers after going through this program and graduate.
2. The collaborators of this project will disseminate and extend NASA-related teaching activities to other courses they teach in STEM curricula.
3. Other faculty in the department or school will routinely be notified about the enhanced teaching strategies that integrate NASA-related curriculum materials.

4. The upper-level courses in the curriculum will be strengthened by infusion of project management concepts.

The outcome objectives are:

1. 70% of students in Introduction To Engineering and Differential Calculus will demonstrate improved skills in analytical reasoning and critical thinking at the end of the semester scoring higher on the post-test than the pre-test.
2. 80% of students enrolled in Computer Science seminar classes will demonstrate an increased knowledge and understanding of project management concepts and skills by integrating these concepts into their final research projects. Dissemination efforts and findings will be included in the annual reports and be available on the University's website Paper presentations at the professional meetings and the publishing of new methods in the educational journals are also anticipated.

PROGRAM RELEVANCE TO NASA

One goal of this program is to develop students skill sets and competence in applied sciences and engineering using one or more missions of the NASA enterprises. One of NASA's enterprises is Aerospace Technology. The exploration of NASA's aerospace technology requires a basic understanding of the concept of the gravity, equilibrium and motion of an object in space. The freshmen engineering students who take the ENGR 102 course have not been exposed to the vigorous major courses such as Physics or Mechanics (Statics or Dynamics) at the freshmen level. However, the above-mentioned concepts are introduced in the Physical Science course (Chem101), which is not required for our STEM students. Hence the students, specially engineering majors, are not exposed to the concepts of equilibrium, microgravity, and to the question, why do planes fly. Exploration of answers to these questions through NASA related activities are planned for introduction in courses related to three different majors, Pre-engineering, Computer Science, and Mathematics. Project Management is another area in which NASA would like to train more project managers from under-represented groups. For that, our program implements a train-the-trainer process, with the investigators taking classes in PM skills and becoming certified to teach PM in all aspects of STEM education.

PROGRAM BENEFITS TO SOCIETY

The quality of Claflin University's course offerings, specifically the three courses mentioned above, will be significantly enhanced by the CIPA II grant. In each of the classes, the students will be exposed to enhanced instruction in several different ways. As a result, students will become motivated, better prepared and better-rounded professionals who will succeed in today's global, technological, and multicultural society. Additionally, increasing the

number of underrepresented minorities who graduate in STEM fields and into NASA-related graduate study and careers will attract more minority students into these disciplines.

With the infusion of project management concepts, theory and practice, students who graduate in the Department of Mathematics and Computer Science at Claflin University will have a chance to obtain skills that are critical in today's work environment. They will be equipped with both theoretical and practical knowledge that will enable them to enter the workforce and successfully compete even in those areas where minority students have been traditionally underrepresented.

By introducing NASA-focused themes in the designated courses, students will have a chance to become familiar with important technological advancements in aerospace sciences and related areas, and they will be exposed to NASA related scientific and technological fields that they may choose as possible career paths.

State-of-the-art technology acquired through this grant will help students to obtain the most up-to-date and marketable skills in their specific areas, which will be an additional benefit for society.

PROGRAM GOALS

- To increase students' skill sets in analytical reasoning and critical thinking in the science, technology, engineering, and mathematics (STEM) related disciplines;
- To provide opportunities for under-represented STEM students to be exposed to NASA oriented science, mathematics and research experiences;
- To infuse project management concepts and skills in the STEM courses through active learning and the undergraduate research program.

PROGRAM ACCOMPLISHMENTS

1. Train the Trainer Case: The PI and a co-PI fully completed a project management certified program within two year time in the Continuing Education Program at Midlands Technical College (MTC) in Columbia, SC. At the same time another co-PI and a faculty,90% completed that program. Therefore, they trained themselves before they train the students in project management (PM).
2. Microsoft Project software was installed in all computers in the lab including the faculty offices of the project team.
3. PM Concepts and NASA themes were integrated in the following courses. ENGR 102 Introduction to Engineering, Instructor: Dr.

N. Sriskanda; MATH 201-Calculus (for engineering & math majors) Instructor: Mr. D. Mani, CSCI 491 & 492- Computer Science senior seminars - Instructor: Dr. Z. Lengvarszky. The objectives of the courses and the program of study were modified to include PM aspects and NASA-oriented themes and university officials approved those syllabi.

4. The basement of the JST science building at Claflin was modified to be a UNIX system lab as well as a pre-engineering lab with the renovation of appropriate physical structures and the purchases of LCD projector, projection screen and appropriate furniture. New Solaris UNIX computer system was added with ten new flat panel screens. Mathematics software, Maple 10, was installed on the server.
5. A new computer science/computer engineering course CSCI 450 Embedded Systems, was developed and taught in spring 2007 for the computer-engineering students to get experience in Robotics skills. For that computer engineering faculty member, Dr. Mahalingam, joined the project team to accomplish that goal and was another resource for the project.

STUDENT ACCOMPLISHMENTS

In year 2007, ten students majored in different disciplines of engineering were trained in applying project management (PM) concepts and ideas in their course projects and were involved in learning activities related to PM aspects and to NASA-oriented themes. Microsoft Project was introduced for the students to plan, schedule, and allocate their resources in their assigned projects. Their learning concepts were evaluated by the pre- and post-test and by the outcomes of their final project reports. 80% of students were acquired the intermediate level of PM concepts and skills. As a part of the infusion of NASA themes, two hands-on-activities, Rocket Invention Activity and Air Rocket Activity, were designed and delivered to the class. By those activities, students were able to connect the concepts of the activities with a flight of a rocket in the space. A section of Calculus I (Math 201) course was modified to be as Calculus I (for Math and Engineering) with inclusion of PM concepts and NASA-oriented themes. A hands-on-group-activity, Rocket to the Stars, which is more related to NASA Aerospace Technology was infused in the course and twenty-five (25) students in the spring 2007 and ten (10) students in the fall 2007 were trained in basic concepts of PM and were involved in the NASA Aerospace Technology activities.

In the spring 2007 semester, in the senior seminar course II -CSCI 492, ten (10) students were encouraged to do research in the selected NASA topics for class presentation. The topics include:

- Researching Recent NASA Missions (e.g. Mars Rover, Hubble Telescope.)
- History of NASA

- Modeling Spacecraft Flight.

Students were introduced to PM terminology and basic concepts as well as to the software product Microsoft Project. Senior thesis proposals were to be completed using PM concepts and students were asked to plan their proposal/research using MS Project. In the fall 2007, in the senior seminar course I -CSCI 491, six (6) students were exposed to PM concepts. Students took a Pre- and Post Test at the beginning and at the end of the semester with an improvement of 34% in scores. The software MS Project was introduced to students during the semester. Students in this course (and in CSCI 492) work on their Thesis Proposal. They were asked to outline and plan their work in MS Project.

A new course in computer engineering discipline, CSCE-450 Embedded Systems, was developed to introduce Robotics expertise to computer engineering majors. Three (3) seniors successfully completed the course before their graduation on May 2007.

In the fall 2007 two students, Jaki and Ahmed, were identified and encouraged to do undergraduate research in space science. Their topics were analyzing the effectiveness of geometric shapes of solar panels and what is the dark energy in the space.

PICTURES (6 images)

CIPA

Talladega College

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Dr. Charlie Stinson
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PROGRAM DESCRIPTION

The goals of the program are to provide courses to STEM students that will lead to a minor in project management and offer NASA related topics in selected STEM courses.

PROGRAM RELEVANCE TO NASA

The program seeks to provide skills to STEM students in project management coupled with experience and methodologies.

PROGRAM BENEFITS TO SOCIETY

The program will benefit society through the successes and contributions of NASA made by program participants. Skills gained by participants in this program will be used in other venues within society. Participants in this program might ultimately become politicians who will impact the NASA program in a positive manner.

PROGRAM GOALS

To enhance the aerospace curriculum by imparting to students project management skills in aerospace-related disciplines.

PROGRAM ACCOMPLISHMENTS

The program is in the process of offering the third of three courses in project management leading to a minor.

STUDENT ACCOMPLISHMENTS

Several students will be taking the third course in project management Spring of 2008 and placed in intern positions summer 2008.

PICTURES (1 image)