



U. S. Department of Education

**Project Abstracts for  
New Grantees for FY 2011**

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Funded under Title III, Part F, Hispanic-Serving  
Institutions Science, Technology, Engineering  
and Mathematics and Articulation Programs (HSI  
STEM & Articulation Programs)

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## Introduction

The Hispanic-Serving Institutions Science, Technology, Engineering and Mathematics and Articulation Programs (HSI STEM & Articulation Programs) is authorized under Title III, Part F, Section 371 of the Higher Education Act of 1965, as amended by the Health Care Reconciliation and Education Affordability Act of 2010. Grants are competitively awarded to institutions of higher education with 25 percent or more Hispanic student enrollment for projects that propose -- (1) to increase the number of Hispanic and other low-income students to attain degrees in the fields of science, technology, engineering and mathematics; and (2) to develop model transfer and articulation agreements between two-year Hispanic-serving institutions and four-year institutions.

The HSI STEM & Articulation Programs support activities that improve educational opportunities for students. The activities may include: scientific or laboratory equipment for teaching; construction or renovation of instructional facilities; faculty development; purchase of educational materials; academic tutoring or counseling programs; funds and administrative management; joint use of facilities; endowment funds; distance learning technologies; teacher education; improve student support services, including innovative and customized instruction courses designed to retain students and move the students into core courses; articulation agreements; student support programs designed to facilitate the transfer of students from two-year to four-year institutions and providing education, counseling services, and financial information designed to improve the financial and economic literacy of students and their families.

Five-year individual development grants (one eligible Hispanic-Serving Institution) and five-year cooperative arrangement development grants (an *eligible* Hispanic-Serving Institution in cooperation with one or more institutions of higher education) have been awarded to eligible institutions selected through a competitive process. All eligible institutions must develop articulation agreements with a two-year HSI as a part of the approved grant. The maximum award amount for Individual Development Grants is \$870,000 per year and the maximum award amount for Cooperative Development Grants is \$1,200,000 per year.

In order to receive a grant under the Title V program, an institution of higher education must have applied for and been designated as an eligible institution. The Notice Inviting Applications for the Designation as an Eligible Institution was published in the Federal Register on December 7, 2009 (74 FR 64059) and the deadline for application was January 6, 2010. The Notice Inviting Applications for Designation as Eligible Institutions for FY 2010 was reopened on August 13, 2010 (75 FR 49484), and the deadline for applications was September 13, 2010. Only institutions that submitted the required application and received designation through one of these processes were eligible to submit applications for the 2011 competition.

The Notice Inviting Applications for new awards for fiscal year (FY) 2011 was published in the Federal Register on March 25, 2011. The deadline for the transmittal of applications was April 29, 2011. As required by the Department of Education, applications for grants under the FY 2011 HSI STEM & Articulation Programs grant competition were submitted electronically using Grants.gov.

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**P031C110008**  
**Arizona Western College, AZ**  
**University of Arizona-College of Engineering, AZ**  
**Cooperative Development Grant**

**ABSTRACT**

The FUTURES Project is a collaborative project by Arizona Western College (AWC) and the University of Arizona (UA) College of Engineering that will provide access to science, technology, engineering, and mathematics (STEM) opportunities in an area that is severely restricted due to geographic, socioeconomic, and academic barriers. FUTURES is an innovative endeavor to increase the number of Hispanic and low-income students attaining STEM degrees by: (1) inspiring students to engage in STEM discovery and innovation; (2) developing a world-class STEM workforce talent pool; (3) attracting and retaining STEM talent through a dynamic and innovative school environment; and (4) delivering coordinated, collaborative and cohesive STEM programs.

This will be achieved by tailoring academic supports to meet the needs of underrepresented minority and low-income students, including: supplemental instruction and curriculum development/design enhancement of innovative courses that utilize the latest technology. Hands-on, real-world experiences will allow students to make connections between courses, disciplines, technology, and the larger world. FUTURES incorporates research opportunities, a best practice at community colleges and Hispanic-Serving Institutions for expanding the pipeline of Hispanic students in science and technology (Center for Urban Education, Nov. 2010). Also included are outreach and advising support designed to augment existing systems to ensure greater cohort graduation success rates and state-of-the-art facilities and equipment that will assist students to gain skills to be competitive and academically successful.

The proposal is vital to meeting the local community workforce needs, by building an articulation/transfer model that allows Arizona Western College and University of Arizona to offer all four years of a Systems Engineering baccalaureate with the opportunity for specialization in renewable energy in Yuma, Arizona. FUTURES offers unprecedented access to STEM opportunities by engaging and equipping a new population of underrepresented students to pursue STEM studies by opening an accessible pipeline to STEM success from the development of an enhanced AWC engineering transfer program and degree through the establishment and offering of UA Engineering fourth year courses locally.

**P031C110009**

**Antelope Valley College, CA  
Cerro Coso Community College, CA  
Cooperative Development Grant**

### **ABSTRACT**

Antelope Valley College located in Lancaster, CA and Cerro Coso Community College located in Ridgecrest, CA are public California community colleges serving an expansive high desert area outside of Los Angeles commonly referred to as Aerospace Valley. Local industries have grown increasingly dependent on importing engineers and technology-skilled workers to fulfill workforce needs, but attrition of relocated employees is a continual and costly problem which is now compounded by an aging science, technology, engineering, and mathematics (STEM) workforce. Meanwhile, new enrollments at Antelope Valley College and Cerro Coso are increasingly underprepared and STEM participation and degree attainment is inadequate and declining. Aerospace Valley's fast growing Hispanic K-12 population provides a challenge as well as a potential solution for Antelope Valley College and Cerro Coso if they can increase the participation and eliminate achievement gaps of Hispanic students in STEM. Intersegment collaboration is needed to develop an engineering degree pathway. Strategies include targeted outreach, curriculum and facilities development for a fully aligned pathway, and faculty development.

#### **Project Goals /Related Measurable Objectives:**

Goal 1: Develop a local engineering program built on the principles of modern engineering that are responsive to student needs and local industry.

- Objective 1.1: To increase enrollment in Long Beach State's local engineering program by 50 students each grant year.
- Objective 1.2: To train 100 percent of engineering pathway faculty

Goal 2: To develop a seamless engineering pathway which supports increased transfer through as sustained "second-level" transfer and articulation process.

- Objective 2.1: To transfer at least 40 students each year from Antelope Valley College and 10 from Cerro Coso to Long Beach State as engineering majors.
- Objective 2.2: A model transfer and articulation agreement will be 100 percent completed.

Goal 3: To effectively serve Hispanic students and increase degree attainment goals by achieving equity in STEM pathway milestones.

- Objective 3.1 To reduce by 10 percent the overall six-year STEM graduation rate equity gap between first-time, full-time Hispanic and non-Hispanic white students (13 percent gap);
- Objective 3.2. To 100 percent eliminate the equity gap between Hispanic and non-Hispanic students in key pathway milestone (first year retention, transfer, course success rates) leading to degree in engineering pathway.



**P031110161**

**California State University – Channel Islands, CA**

**Oxnard College, CA**

**Ventura College, CA**

**Santa Barbara City College, CA**

**Cooperative Development Grant**

## **ABSTRACT**

**Project ACCESO - Achieving a Cooperative College Education through STEM Opportunities**  
*Acceso a la ciencia y las matemáticas: Providing Access to Science and Mathematics*

CSU Channel Islands (CI) will collaborate with each of its regional community colleges to achieve five goals: (1) to increase the number of Hispanic and low-income students who are succeeding in and graduating from science, technology, engineering, and mathematics (STEM) majors at CI; (2) to increase the number of Hispanic and other low-income students interested in pursuing a bachelor's degree in STEM; (3) to develop and disseminate model transfer and articulation agreements between CI and its educational partners; (4) to enable more data-driven decision-making related to the retention and graduation of Hispanic and other low-income students; and (5) to assist Hispanic and other low income students in their development of critical STEM skill sets including critical thinking, analytical reasoning, scientific literacy, and interdisciplinary communication.

We will achieve these goals by implementing projects designed to provide Hispanic and low-income students with support services including a summer bridge program and academic year tutoring, peer mentoring, and peer-led supplemental instruction – all designed to help these students succeed in STEM majors at CI. In addition, CI will initiate and implement new outreach efforts designed to encourage Hispanic and low-income P-14 students with the motivation and interest in pursuing STEM as a future major and career. Model articulation agreements will be developed through the collaboration of CI and community college faculty. Finally, CI and community college students will be engaged in undergraduate research opportunities embedded in gateway STEM courses and in academic year and summer research programs.

**P031C110116**

**California State University – Fullerton, CA**

**Citrus College, CA, Cyprus College, CA, and Santiago Canyon College, CA  
Cooperative Development Grant**

**ABSTRACT**

California State University, Fullerton (CSUF), a four-year comprehensive university and Hispanic-serving institution (HSI) in Orange County, California, and three of its feeder community colleges, Citrus College, Cyprus College and Santiago Canyon College, also HSIs, have created Strengthening Transfer Education & Matriculation in science, technology, engineering, and mathematics (STEM), a multifaceted project designed to encourage STEM degrees, retain students in STEM fields, produce more community college STEM transfers to four-year institutions and, ultimately, increase the number of Hispanic/Latino and low-income students attaining STEM baccalaureates.

CSUF has an enrollment of more than 37,000 students, 27 percent of whom are Hispanic and 49 percent who are classified as low-income and/or first generation. CSUF enrolls almost 6,000 new upper-division transfer students each year, leading the state. Two-year HSI institutions provide the majority of these students, accounting for more than 75 percent of the annual transfers. Based on its geographic location, CSUF has the potential to produce large numbers of Hispanic and low income STEM graduates by establishing effective STEM programs and building strong linkages with its HSI community college neighbors.

The project has three goals:

1. Increase the number of Hispanic or low-income students attaining degrees in STEM fields;
2. Develop model transfer and articulation agreements between two-year HSIs and a four-year institutions in STEM fields; and
3. Enable more data-based decision making.

Key project activities include:

1. Supplemental Instruction workshops.
2. Peer mentors.
3. STEM Advisors.
4. STEM transfer orientation program.
5. Summer research experiences with stipends.
6. Family activities for STEM Students and families.
7. STEM transfer associate degrees.
8. Online degree planning application (College Education Planner).
9. STEM student tracking system.
10. Early Alert System.

We anticipate that the proposed project will make a significant impact on the educational success, transfer and eventual degree attainment of Hispanic and other low-income students in STEM.

**P031C110031**  
**California State University- Northridge, CA**  
**Glendale Community College, CA**  
**College of the Canyons, CA**  
**Cooperative Development Grant**

**ABSTRACT**

This collaborative project will be led by California State University, Northridge, in partnership with Glendale Community College (GCC) and the College of the Canyons (COC). All three institutions are designated Hispanic-serving institutions. The primary objectives of the grant are: (1) To increase the number of Hispanic and low-income students who successfully transfer from Glendale Community College and College of the Canyons to California State University to pursue majors in Engineering and/or Computer Science, (2) To increase the number of Hispanic and low-income students who graduate from CSU Northridge with degrees from CECS undergraduate programs, and (3) To develop a model, seamless transfer program to assist Hispanic and low-income students to successfully transfer from Glendale Community College and College of the Canyons, to California State University, Northridge where they will complete their studies in Engineering and/or Computer Science.

Students and faculty members in the College of Engineering and Computer Science at CSUN, GCC, and COC will be participating in this grant. The grant envisions supporting a total of 120 students over five years. A comprehensive project plan is proposed to address the academic needs of students in the cohort that includes proactive academic advisement and tracking, organized tutoring, peer and faculty mentoring, hands on research opportunities and project based learning, career advising and eventual transition to the workforce or advanced studies. Students in the cohort will be supported with stipends to motivate and inspire them to succeed. Another key objective of this grant is the development of sustainable, seamless transfer agreements between the community colleges and CSUN. Working collaboratively, faculty from CSUN, GCC and COC will develop and team-teach courses and address the gaps which exist in the articulation agreements. They will create model transfer agreements to ensure the timely graduation of students in the cohort. A unique aspect of this grant is the integration of technology to enhance student learning. The grant aims to create a mobile digital environment with tablet PC's and software, to enhance communication, engagement, collaboration and creativity, and instant learning assessment of the students in the cohort.

Internal assessment of the program objectives and outcomes will be conducted continuously by the Program Assessment and Evaluation Committee made up of the PI's of the grant and the internal program evaluator. An external HSI STEM advisory committee will be established to reinforce the success of this program with prominent members from academia and industry. This advisory committee will also evaluate the program's progress in terms of specific goals, interact with the faculty and students, and offer constructive feedback to improve the program on an ongoing basis. A project Website will be created and maintained to inform and disseminate progress on achievement of the goals and objectives of the grant.

As we look to the future, we can think of no greater investment than the education of our future engineers and computer scientists. This grant will have an enduring impact on the academic success and career choices of the talented youth in our region, and ultimately, we hope an enduring impact on the growth and health of California's economy. As these talented students, who represent both minorities and females, matriculate to the university, they will, in turn, serve as role models for others in their communities. This collaborative partnership between CSUN, GCC and COC will be instrumental in creating a larger, more inclusive pool of STEM graduates.

## **P031C110152**

**California State University – Santa Monica, CA**

**University of California – Los Angeles, CA**

**Cooperative Development Grant**

### **ABSTRACT**

The purpose of this cooperative project is to increase the number of community college students, particularly traditionally underrepresented students, who transfer to a baccalaureate program in a science, technology, engineering, and mathematics (STEM) discipline. Santa Monica College (SMC) and University of California, Los Angeles (UCLA), will work together to achieve this community college outcome, as UCLA is as interested in increasing the number of community college transfer students as is SMC.

#### **Key Strategies and Activities**

Increase student interest in STEM degrees and careers:

- Develop of STEM outreach materials that clearly articulate the potential STEM educational and career pathways.
- Highlight relevancy of STEM careers to real-life applications by encouraging students to participate in environmental education and action modules that demonstrate science application.
- Strengthen career assessment and planning in STEM.
- Offer Summer STEM Orientation.

Develop a STEM Scholars Program that will enroll 100 students per year to serve as the focal point for students interested in STEM careers:

- Offer an array of student support services, utilizing the cohort model, including counseling, advising, student success skill building workshops and family activities.
- Expand Supplemental instruction in historically difficult transfer-level STEM courses.
- Facilitate STEM seminars, workshops, and lecture series.
- Expanded professional development for faculty focused on effective teaching and learning practices to support traditionally underrepresented minority students.

Strengthen student transfer and program/course articulation:

- Review existing articulation agreements with UCLA baccalaureate programs.
- Update equipment and instrumentation to align with upper division coursework.
- Expand the instructional capacity of the Center for Environmental and Urban Studies and integration of environmental science applications throughout the STEM fields.
- Offer summer bridge programming at UCLA.
- Develop applied research experiences in STEM courses, including a summer research experience at UCLA.

In doing so, the partnership will achieve the following outcomes by Year Five of the project:

- 80 percent of URM students will report increased awareness of STEM careers and 25 percent will express an interest to pursue STEM.
- 80 percent of STEM scholars will be successful in their coursework and will maintain a fall to fall persistence rate of 70 percent.
- 35 percent of STEM scholars will transfer within three years of enrollment in the program.

**P0321C110082**  
**California State University – Stanislaus, CA**  
**Merced College, CA**  
**San Joaquin Delta College, CA**  
**Cooperative Development Grant**

**ABSTRACT**

California State University, Stanislaus (CSU Stanislaus) serves as the lead institution in a cooperative arrangement with Merced College (MC) and San Joaquin Delta College (SJDC) for the proposed project. The proposed project has two goals:

- 1) Develop a transfer and articulation model between CSU Stanislaus and its partnering regional community colleges to increase successful enrollment, persistence, retention, and graduation of Hispanic and transfer students in science, technology, engineering and mathematics (STEM).
- 2) Provide support services to strengthen and expand high-impact practices to increase engagement, retention, and graduation of Hispanic and low-income students in STEM.

The proposed project consists of the implementation of two activities specifically identified and carefully designed to achieve the objectives of increased enrollment representation and degree completion by Hispanic and low-income transfer and non-transfer students in STEM disciplines. Both activities will be informed through the collection and analysis of high quality and timely data in direct response to the goals and to the program's absolute priorities and competitive preference.

Activity 1. Warriors on the Way - STEM (W.O.W.-STEM). Objective: Through the development and utilization of strategies, tools, and resources, implement a STEM transfer pathway and articulation model between CSU Stanislaus, MC, and SJDC to increase enrollment, persistence, and graduation of Hispanic and low income transfer students in STEM.

Activity 2. Science and Math Resource Center Objective: Centralization of STEM student resources, and facilitation of support programs including faculty mentored research and peer mentors, will facilitate Hispanic and low-income STEM transfer and non-transfer students' ability to successfully transition into and complete courses in their chosen disciplines.

Measureable Goals:

- 1) Increase the enrollment percentage of Hispanic and low-income transfer students from the cooperative partners to CSU Stanislaus in five STEM disciplines by an average of 20 percent over the grant period and sustain these enrollment levels beyond the funding term.
- 2) Increase CSU Stanislaus STEM degree completion by Hispanic and low-income transfer students from the cooperative partners by 20 percent over the grant period and sustain degree completion beyond the funding term.
- 3) Increase CSU Stanislaus STEM degree completion by all Hispanic and low-income students by 15 percent over the grant period and sustain degree completion beyond the funding term.

**P031C110092**  
**East Los Angeles College, CA**  
**University of Southern California, CA**  
**Cooperative Development Grant**

### **ABSTRACT**

East Los Angeles College is a public, two-year Hispanic-serving (78 percent) community colleges located in one of the most economically challenged, diverse regions of Southern California. University of Southern California is one of the nation's elite undergraduate, graduate and research institutions.

The proposed activity is *GANAS (Goals and Needs to Accelerate science, technology, engineering, and mathematics (STEM))* –to attract students into STEM disciplines and careers, and then help them to achieve completion (degrees or transfers) within a shorter time period. Transfers to private institutions will be emphasized, with University of Southern California providing expertise and advocacy to other targeted transfer institutions.

*Component One:* Math Academy will provide 200 targeted East Los Angeles College STEM students the ability to reach advanced math courses in a timely manner. Program is designed as a five-week intensive, with 72-hours of intensive math crammed into six days each week, with lecture, lab and tutoring sessions.

*Component Two:* Media-assisted instruction frees students from the traditional bounds of lecture and brick-and-mortar based instruction. The upside potential is that East Los Angeles College, along with other Hispanic Serving Institutions, will be able to change prevailing methods of teaching higher levels of math, resulting in more course completions, lower rates of attrition, higher persistence, more STEM graduations, higher transfer rates, lower overhead costs in content development, and greater collaboration among community college instructors.

*Component Three:* Faculty advising will identify and train 60 full-time and adjunct faculty across all STEM disciplines to advise students regarding course sequences and transfer requirements. In addition, the project will employ a bilingual Community/High School Outreach specialist who will assist faculty advisors in explaining individual STEM education plans during parent/family orientations scheduled each term.

*Component Four:* Articulation/transfer development with private universities will trouble-shoot transfer problems for individual STEM students who plan to transfer to University of Southern California or other private colleges and universities. The project will develop one-unit courses to assist students in sampling specific areas of study; and will offer students a one-week, one-credit orientation to STEM careers.

**P031C110070**  
**Gavilan College, CA**  
**San Jose State University, CA**  
**Cooperative Development Grant**

## **ABSTRACT**

The proposed project is titled, *Science, technology, engineering, and mathematics (STEM) MAGNET: Improving Pathways for Hispanic/Low-Income Students*.

### **Part 1: STEM Pathways**

- Magnet Outreach: STEM awareness activities.
- Articulation Council streamline five aligned majors.
- Faculty Development for new curricula, Studios.

### **Part 2. Increase STEM Support**

- MathPath: Accelerated basic math sequences.
- Case Management: STEM Counselor services.
- Summer Institute: intensive math practice bridge.
- Supplemental Instruction: tutors help with skills.

### **Part 3: Strengthen STEM Curriculum**

- Faculty development: update, test new methods.
- Research Internships provide hands-on research.
- Re-design/update Engineering curricula.
- New Environmental Science will engage majors.

### **Project's Measurable Objectives**

1. Increase the number and proportion of Hispanics, women, others declared as STEM majors.
2. Increase percentage of cohorts, basic math re-designed courses that succeed and persist to next level.
3. Increase percentage that succeeds in courses using Supplemental Instruction in gateway courses.
4. Increase percentage of cohorts who succeed in new Studio and other new curriculum pilots.
5. Increase percentage of Summer Institute cohorts who complete and register for the next STEM level.
6. Increase percentage of STEM majors who complete milestones: 12, 30 units, 60-transfer, BA/BS.
7. Close gaps between Hispanic /White and women/men students on all measures above.

**P031C110180**  
**Glendale Community College, CA**  
**Individual Development Grant**

**ABSTRACT**

Glendale Community College, a large public community college serving the greater Los Angeles area, will build on a solid foundation of strengths and experiential learning to develop a science, technology, engineering, and mathematics (STEM) learning environment with the characteristics now recognized to have the most potential to improve access to STEM for Hispanic and other low-income students. The STEM learning environment to be developed through this project is tailored to meet the needs of Hispanic students who are still not succeeding equitably at Glendale Community College and who critically need to complete college degrees in STEM. Each project activity was selected on the basis of internal and national research now available about what works best to address institutional weaknesses so that Glendale Community College will be better able to meet the needs of its Hispanic students in STEM. The service area has enormous need for a workforce with degrees in STEM and provides many career opportunities in STEM areas for Hispanic students who complete degrees. Glendale Community College has many gaps in addressing this need, and it is a high institutional priority to close these gaps.

The proposed project is titled, ***Building a More Responsive STEM Success Environment at Glendale Community College for Underserved Hispanic and Other Low-Income Students.***

**Priority 1.** Increase the number of Hispanic and low-income students attaining STEM degrees. The top priority project goal is to improve the academic success and STEM degree completion of Glendale Community College's Hispanic students, focusing on building structures of opportunity in an effective learning environment.

**Priority 2.** Enable more data-based decision making in projects designed to improve postsecondary student outcomes. The most important ingredient of an effective STEM learning environment is a fully-integrated system for student learning outcomes assessment. The project includes developing this system to support data-based decision making.

**Priority 3.** Develop a model transfer and articulation agreement in STEM fields. The second project goal is to develop a model transfer and articulation agreement with local transfer universities and other partners to increase STEM degree completion through strategic collaboration that is designed to help Glendale Community College improve services to underrepresented STEM transfer.



**P031C110068**  
**Hartnell College, CA**  
**California State University Monterey Bay, CA**  
**University of California Santa Cruz, CA**  
**Cooperative Development Grant**

### **ABSTRACT**

Hartnell College's cooperative application for a grant under the U.S. Department of Education HSI STEM and Articulation Program will create the STEM Regional Community College-to-University Success Program. The project will address both the absolute and competitive preference priorities as established by the Department. The project design overview includes:

**Overall Goals** – to improve enrollment and transfer in STEM; implement seamless pathways.

**Goal 1:** increase number of Hispanic and low income students attaining STEM degrees by 50 percent.

**Goal 2:** increase transfer rates through articulation agreements between Hartnell, California State University Monterey Bay and the University of California Santa Cruz in five STEM fields.

**Goal 3:** enable more data-based decision-making by collecting or obtaining, analyzing, and using high-quality and timely data, including data on program participant outcomes.

**How:** create a seamless, articulated pipeline with activities and an integrated support structure among three educational levels to increase the number of Hispanic and low income students transferring and attaining degrees in high growth STEM majors.

**Methods** (services): five articulated STEM pathways in biology, marine science, engineering, computer science, and physics; model transfer agreements; collaborative research opportunities for faculty and students; regional research symposium; supplemental instruction; tutoring services; living/residential learning communities; paid internships; faculty and staff training; teacher externships; high school student engagement; improved data collection; and evaluation.

**Support:** updated laboratory infrastructure to support learning and success; leveraging existing personnel, programs, and infrastructure; technicians to support programming and data analysis; collegial faculty and staff training.

**P031C110073**  
**Kern Community College, CA**  
**California State University-Bakersfield, CA**  
**Cooperative Development Grant**

**ABSTRACT**

Bakersfield College (BC) and California State University Bakersfield (CSUB), the two cooperating institutions in this project, are located just 10 miles from each other and share the socio-economic and demographic challenges of the region they serve. The proposed project is titled, *Turning a Gateway into a Pathway to STEM Degrees for Hispanic and Low-income Students in the Southern San Joaquin Valley*.

Goal 1. To provide an engaging and effective STEM learning environment (instruction, services and facilities).

Goal 2. To achieve second level articulation with California State University Bakersfield in all STEM transfer pathways.

Goal 3. To improve the data available to support the continuous improvement of programs and services and to enable more data-based decision-making.

**Measurable Objectives:**

- To increase enrollment in STEM degree programs by 10 percent.
- To increase the basic skills math improvement rate by 12 percent.
- To increase successful course completion in all redesigned STEM courses by 10 percent.
- To double the number of California State University Bakersfield STEM transfers (over 2009 baseline of 57), eliminating the transfer equity gap by 100 percent.
- 2.1 To identify and align 100 percent student learning outcomes within Bakersfield College's STEM curriculum.
- 2.2 Working together, Bakersfield College and California State University Bakersfield will redesign three lower division STEM courses per year.
- 2.3 To develop a model articulation and transfer agreement with California State University Bakersfield for engineering pathway.
- 3.1 To develop database dedicated to tracking STEM students through early pathway milestones.
- 3.2 Working with California State University Bakersfield, to develop inter-segmental capacity to track and compare Bakersfield College STEM transfer students' success rates and milestone achievement through degree completion.

**P031C110101**  
**Mount St Mary's College, CA**  
**El Camino College, CA**  
**Cooperative Arrangement Grant**

### **ABSTRACT**

"Improving STEM Curricula, Support & Articulation for Hispanic, Women & Low-Income Students" Partners

Project Measurable Objectives:

- Objective 1: increase percentage of Summer Jumpstart math students who complete requirements and become math majors.
- Objective 2: increase percentage of students who succeed in STEM gateway courses.
- Objective 3: increase number of STEM majors.
- Objective 4: increase number of Hispanic students who complete cohorts.
- Objective 5: increase number of student research interns who rate their experience positively.
- Objective 6: increase faculty innovation through the development of new curricula.
- Objective 7: increase alignment in five STEM majors.

The cooperative strategies for this application include strengthening the STEM curriculum, improving STEM support, and aligning majors and courses. These strategies are based on data that show students become more motivated and more attracted to STEM fields through field experience. Additionally, it has been determined that students at the feeder schools need more information regarding STEM careers.

**P031C110056**  
**Pasadena City College, CA**  
**California State Polytechnic University, CA**  
**Cooperative Development Grant**

### **ABSTRACT**

The proposed cooperative project-*Developing an Accessible Intersegment STEM Pathway in Environmental Sciences for Underserved Hispanic Students* between two large Hispanic-serving public institutions, Pasadena City College (PCC) and California State Polytechnic University, Pomona (CPP), will implement best practice strategies to develop a much-needed environmental sciences degree pathway in the San Gabriel Valley for local Hispanic and low-income high school students. As the third largest single-campus public community college in the country, PCC provides educational access and degree opportunity to thousands of Hispanic students each year. PCC selected CPP to partner in this project because CPP a regional leader in science, technology, engineering, and mathematics (STEM) equity initiatives, is equally committed to becoming a highly effective Hispanic-serving institution which provides equitable degree completion opportunity in STEM. PCC, the lead institution, will work with CPP to develop a model intersegment STEM pathway to increase participation and ensure equitable degree completion.

**The project objectives are:**

- 1. First year milestones.** By September 30, 2016: **(a)** each environmental science (ES) pathway cohort will report 90 percent first year retention rate with no gaps between Hispanic and non-Hispanic students; and **(b)** 85 percent of environmental science pathway cohort will complete 20 credit hours (including basic skills) in the first year with Hispanic students equitably represented relative to total enrollment.
- 2. Second and third year milestones.** **(a)** 70 percent of each environmental science Pathway Cohort (beginning with 2012-2013) will earn 30 transferrable college credits within two years of enrollment, with Hispanic students equitably represented; **(b)** 60 percent of each environmental science Pathway Cohort (beginning with 2012-2013 cohort) will earn 60 transferrable college credits within three years of enrolling at PCC, with Hispanic students equitably represented relative to total enrollment;
- 3. Transfer.** To maintain a 35 percent transfer rate of full-time, degree-seeking Environmental Sciences majors to CPP (beginning with 2012-2013 cohort), with Hispanic students equitably represented relative to total enrollment (PCC's current transfer rate is 20.2 percent for full-time, first-time degree seekers.);
- 4. Degree Completion.** To maintain at least a 40 percent six-year degree completion rate for each Environmental Science pathway cohort (beginning with the 2012-2018 cohort), with Hispanic students equitably represented;
- 5. Sustainable Enrollment.** To have a fully sustainable Environmental Sciences program (which requires 200 Full-time Equivalents) by increasing enrollment by 50 full-time, degree-seeking students each year (beginning in 2012-2013 cohort) with Hispanic students equitably represented relative to total enrollment.

**P031C110183**

**Rancho Santiago Community College – Santa Ana College, CA**

**Fullerton College, CA**

**California State University – Fullerton, CA**

**Cooperative Development Grant**

**ABSTRACT**

***Encouraging New Graduates and Gaining Expertise in Science, Technology,  
Engineering, and Math (ENGAGE in STEM)***

**Santa Ana College (SAC), Fullerton College (FC), and California State University Fullerton (CSUF)** will engage in a multifaceted effort to: (1) increase the number of Hispanic and other low-income students attaining degrees in STEM fields; (2) develop model transfer and articulation agreements between the institutions; (3) enable more data-based, decision making; and (4) increase the number of math and science teachers.

Utilizing innovative and wide-reaching outreach strategies to ignite interest in STEM, extensive fieldwork and informal science experiences, undergraduate research and internships, and a myriad of support services, a measurable increase in the number of students entering the STEM pipeline will occur. The development of two specific articulated STEM pathways – one in Engineering and the other in Earth Science leading to a teaching credential will be completed. Evidence-based instructional practices to improve student learning and achievement in STEM courses will foster persistence to successfully complete degrees and transfer. The enhancement and expansion of STEM centers and STEM teaching centers at each partner institution will greatly build the capacity of the institutions to identify and support future STEM majors. Significant efforts to improve data collection, communication, and coordination across institutions and across the region utilizing a joint STEM symposium and the Regional Teacher Education Council will greatly contribute to the success of students pursuing STEM majors, careers, and/or K-12 STEM teaching. **ENGAGE in STEM** proposes to make substantial change to address the need for a STEM knowledgeable and prepared workforce, the low transfer rates of Hispanic and other minority students in STEM majors, and the critical shortage of highly-qualified and diverse K-12 teachers (especially for math and science).

**P031C110049**  
**San Bernardino Valley College, CA**  
**California State University, CA**  
**Cooperative Development Grant**

**ABSTRACT**

The San Bernardino Valley College (SBVC) cooperative HSI STEM & Articulation Programs *PASS GO project* in partnership with California State University, San Bernardino (CSUSB) addresses the following Absolute Priorities: 1) Increase the number of Hispanic and other low income students attaining degrees in the fields of science, technology, engineering, or mathematics; and 2) Develop model transfer and articulation agreements between two-year Hispanic-serving institutions and four-year institutions in such fields. The proposed project also addresses the Competitive Preference Priority, by enabling more data based decision-making to improve postsecondary student outcomes in enrollment, persistence, and completion - leading to career success.

The cooperative project will implement two activities: one strengthens support services for minority and low-income STEM students at San Bernardino Valley College and California State University, San Bernardino; and a second strengthens the existing partnership between the two institutions through a formal partnership that will review and enhance existing transfer and articulation agreements for minority and low-income STEM students.

**Activity One** provides learning support services to improve student access, achievement, and advancement in STEM through three components: Learning Community Cohorts, Academic and Career Support Resources, and Outreach to students and their families.

- **Activity One Component 1:** Establishes and expands Learning Community cohorts for Hispanic and low-income students in STEM fields.
- **Activity One Component 2:** Enhances programs and services offered in tutoring, academic/career counseling, and paid internships, along with new programs that address the needs of students in developmental programs such as placement-test workshops, Supplemental Instruction and faculty professional development.
- **Activity One Component 3:** Outreach will inform incoming students and their families as to their choices and opportunities offered in STEM fields prior to their enrollment and will provide a roadmap for their success.

**Activity Two** expands and strengthens the STEM pipeline, building a bridge for San Bernardino Valley College's students to succeed as STEM majors at California State University, San Bernardino.

**P031C110159**

**San Mateo Community College - Cañada College, CA**

**San Francisco State University, CA**

**Los Angeles Pierce College, CA**

**Cooperative Development Grant**

## **ABSTRACT**

Cañada College, San Francisco State University, and Los Angeles Pierce College, with existing successful working relationships are committed to increasing the representation of Hispanics, African Americans, and other minority groups in STEM. This cooperative proposal is entitled California Alliance for the Long-term Strengthening of Transfer Engineering Programs (CALSTEP).

Cañada College, a Hispanic-serving community college in Redwood City, California, is the lead institution in this cooperative HSI STEM and Articulation Programs proposal. Though many of Cañada College's Hispanic 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. San Francisco State University (SFSU), a large, comprehensive multicultural public university, and Los Angeles Pierce College, a Hispanic-serving community college in Woodland Hills, California, are the other collaborators.

The CALSTEP project aims to maximize the likelihood of success among underrepresented and educationally disadvantaged students interested in pursuing careers in STEM fields. The project also aims to strengthen California community college engineering programs, and facilitate the timely transfer of community college students to four-year engineering programs. It builds upon the success of three prior federally funded programs at Cañada: a three-year U.S. Department of Education Minority Science and Engineering Program (MSEIP) cooperative grant, a two-year NSF Innovations in Engineering Education and Curriculum Infrastructure (IEECI) grant, and a three-year NASA Curriculum Improvements Partnership Award for the Integration of Research (CIPAIR) cooperative grant.

The proposed project utilizes a multi-focused approach to increasing the interest, participation, retention, and success of students from traditionally underrepresented groups in STEM. It promotes an understanding and appreciation of STEM careers through innovative outreach activities for middle school, high school, and community college students. It addresses the main barriers to the retention and success of underprepared students through a combination of intensive preparation for college-level work, multiple entry points and accelerated pathways for students into STEM education, and previously proven academic support strategies. The project will impact not only students in the participating institutions but students all over the State by addressing the recent decline of community college engineering programs in California brought about by the increasing diversification of four-year lower-division engineering curriculum and exacerbated by budget cuts, which threaten this critically important engineering education pipeline. It will do so through innovative initiatives like the Summer Engineering Teaching Institute that will assist engineering programs in improving teaching effectiveness and efficiency using technology, and through the Joint Engineering Programs that will promote collaboration among community college engineering programs all over the state to better serve their students. Together with the Model Transfer Curricula that will be developed by the program, the statewide collaborative programs that will be created through CALSTEP can serve as a model for improving STEM education in public institutions of higher education in other states.

**P031C110193**  
**Taft College, CA**  
**University of La Verne, CA**  
**Cooperative Development Grant**

## **ABSTRACT**

Taft College, located in the western Kern County part of the San Joaquin Valley of central California, is a two-year, public Hispanic-serving community college with a critical and difficult mission to attract and increase the number of Hispanics choosing STEM majors while providing increased support to ensure successful outcomes in success, retention, and degree completion. Taft College is the only institution of higher education in a 45-mile radius and the only avenue to education for students in an expansive service area, which is undergoing dramatic demographic and economic change, and which, by most measures is severely underserved educationally.

Through the project, *Developing a Model Pathway to STEM Degree Completion for Hispanic Students through Targeted Outreach, Research-Based Teaching and Learning Reform, and Model Articulation*, Taft College and its partner, the University of La Verne, will combine expertise and resources to address the critical need for well-trained STEM specialists locally and regionally. The economic lifeline for the service area is the energy/oil and agricultural industries that are becoming increasingly dependent on technology and need technology literate employees.

The broad project goals are:

Goal 1: To develop a sustainable STEM pathway through: targeted outreach to K-12 in order to increase student STEM awareness; college-high school collaboration to improve STEM preparation before college; and in-service teacher professional development opportunities in STEM.

Goal 2: To develop a broad inter-segmental pathway from community college- to baccalaureate degrees in STEM fields including STEM specialties in teaching through a best practice “second-level” transfer and articulation model.

Goal 3: To close the achievement gap of Hispanic students in STEM transfer and degree completion rates through curriculum reform and continuous assessment.

The project design is based on well-known national research that identifies obstacles and offers solutions in closing the equity gap of Hispanics in STEM. It proposes services that will improve Hispanic student success, retention, transfer and graduation rates, using National Science Foundation (NSF) supported technology-based reforms in the science, math, and engineering curricula. A comprehensive assessment/evaluation plan will ensure a continuous quality improvement feedback mechanism.



**P031C110025**

**Ventura County Community College – Oxnard College, CA**

**California State University – Channel Islands, CA**

**University of California – Santa Barbara, CA**

**Cooperative Development Grant**

**ABSTRACT**

This proposed cooperative project between Oxnard College, California State University-Channel Islands (CSUCI) and the University of California-Santa Barbara (UCSB) will build upon the 2008 two-year grant awarding to *dramatically expand and systematize*: model transfer and articulation agreements in STEM fields; truly best-practice inter-segmental early-entry pathways to increase the number of Hispanic/Latino and other under-represented low-income students who attain degrees in STEM careers; and continuous quality evaluation and improvement processes enabling more data-based decision making that collects, analyzes and, uses high quality and timely data including data on program participant outcomes in accordance with privacy requirements to improve post-secondary student outcomes relating to enrollment, persistence and completion leading to career success.

Project ASCENSIÓN will achieve this via the implementation of five interlocking strategies:

*Strategy #1 Enlace*: Brings together learning with the social and cultural forces that shape life.

Continuous quality improvement processes that include the development of performance expectations, success indicators and outcome evaluations are integrated into every major ASCENSIÓN activity which includes the correlated factors of student behavior, school and institution factors and, family characteristics.

*Strategy #2 Vistas Del Futuro*: Creates an Engineering Curriculum Pathway and Enhances the new Environmental Studies Curriculum via the instructional integration of STEM disciplines. State-of-the-art instructional technology, social networking concepts and classroom best practices are incorporated.

*Strategy #3 El Guía Mental: The Mental Guide* incorporates a three-tiered peer approach (high school/college student- university student – graduate/industry leader) to tutoring, supplemental instruction, mentoring and advising to enhance STEM awareness, early readiness, student success, retention, transfer and career attainment.

*Strategy #4 CAN DO*: Contextualized Activities Network-Developing Opportunities. The development of STEM learning communities are integrated across and between STEM disciplines to provide focused learning experiences and opportunities for Hispanic and underrepresented students.

*Strategy #5 The HALO Effect*: Helping and Leading Others includes unique STEM activities, role modeling, parent involvement, support services and cooperative college-university bridges to foster and build competitive STEM professionals and LEADERS of the future.

If the majority of our Hispanic/Latino and disadvantaged students are to enter postsecondary education, it must be through the open door of a community college and then transfer to earn a bachelor's degree. ASCENSIÓN increases access, eliminates transfer barriers, incorporates research/industry-based academic experiences and supports data- driven CQI systems.

**P031C110100**

**Otero Junior College, CO**

**Trinidad State Junior College, CO**

**Cooperative Development Grant**

### **ABSTRACT**

Otero Junior College (OJC) is a public, Hispanic-serving institution serving approximately 1,600 students in rural Colorado. OJC is proposing to partner with Trinidad State Junior College (TSJC) in a project to increase enrollment, retention and completion rates with an added emphasis on transfer to four-year institutions. *Semillas de science, technology, engineering, mathematics (STEM) (Seeds of STEM)* will improve and transform the STEM at OJC and TSJC. Students in an 11-county region of Southern Colorado, including 29 high schools, will be served by *Semillas de STEM*.

**Project Goal:** Increase the number of students pursuing careers in STEM related fields.

**Objective 1:** By Sept. 30, 2016, the number of first-time, degree-seeking undergraduates enrolled in STEM fields at OJC and TSJC will increase by 15 percent.

**Objective 2:** By Sept. 30, 2016, the number of first-time, degree-seeking undergraduates retained from freshman year to sophomore year in STEM fields at OJC and TSJC will increase by 20 percent.

**Objective 3:** By Sept. 30, 2016, the number of first-time, degree-seeking undergraduates at OJC and TSJC who graduate in STEM fields within three years of enrollment will increase by 15 percent.

**Objective 4:** By Sept. 30, 2016, OJC and TSJC will implement resources that will enable an increase of 10 percent of students to make a smooth transition to four-year institutions in STEM degrees of study.

**Objective 5:** By Sept. 30, 2016, the federal per student cost for undergraduate degrees in STEM and Articulation Programs at OJC and TSJC will decrease by 15 percent.

**Expected Outcomes:** Comprehensive academic student support for STEM students; Development and implementation of bridge programming; 3,000 students served through STEM outreach activities; At least nine new 100 and 200 level STEM courses in traditional and online formats; Increased enrollment (up 15 percent), retention (up 20 percent); and graduation (up 15 percent); Articulation agreements with at least three regional four-year institutions; An increase in STEM students transferring to four-year institutions.

**P031C110190**  
**Miami Dade College- North Campus, FL**  
**St. Thomas University, FL**  
**Cooperative Development Grant**

**ABSTRACT**

Miami Dade College (MDC) will collaborate with St. Thomas University to establish a Center for Science, Technology, Engineering and Mathematics for Transition, Retention, Advisement, and Completion (STEM-TRAC). The center will attract promising Hispanic and other disadvantaged students in Miami-Dade County, Florida, to STEM studies, ensuring their attainment of a four-year degree through a combination of high-impact strategies.

The project goals are to: (1) increase the number Hispanics and other disadvantaged students in Miami-Dade County attaining degrees in the fields of STEM; and (2) build on prior joint collaborations and existing transfer articulation agreements with St. Thomas University, a four-year university, promoting the attainment of STEM degrees among Hispanics and other disadvantaged students.

To achieve these goals, Center for STEM-TRAC will achieve four measurable outcomes addressing the enrollment, retention, and completion: (1) increase the enrollment of full-time degree seeking Hispanics and other disadvantaged undergraduates enrolled at Miami Dade College by targeting a minimum of 1,500 high school students during the project period, and enrolling 50 percent of those at Miami Dade College; (2) increase the number of returning first-time, full time degree seeking Hispanic and other disadvantaged undergraduates after their first year to 75 percent (Baseline: 720 first-year participants; 540 returning Center for STEM-TRAC participants); (3) increase the number of first-time, full-time degree-seeking Hispanic and other disadvantaged undergraduates enrolled at the two-year Hispanic-serving institution and graduating within three years of enrollment to 60 percent (324 Center for STEM-TRAC participants); and (4) increase the number of first-time, full time degree seeking Hispanic and other disadvantaged undergraduates transferring to four-year institutions by 50 percent (162 Center for STEM-TRAC participants).

After the project period, Miami Dade College will disseminate project evaluation findings and will institutionalize the center as a replicable model for community colleges nationwide.

**P031C110003**  
**New Jersey City University, NJ**  
**Hudson County Community College, NJ**  
**Cooperative Development Grant**

**ABSTRACT**

Hudson County Community College and New Jersey City University (NJCU), located in Jersey City, New Jersey, propose a cooperative arrangement project to address a significant problem—students unable to enter science, technology, engineering, and mathematic (STEM) majors because of failures or slow progress in early mathematics courses. This Project represents a carefully planned attempt to address the loss of Hispanic students from STEM pathways by improving student success in mathematics courses that are the gatekeepers to those career paths. The project will have one overarching goal: to increase the number of Hispanic students who graduate with STEM degrees.

The activity will use three strategies to improve the rate at which students succeed in developmental classes and their ability to transfer and begin STEM majors at NJCU:

1. Improve Transfer Pathways to Increase STEM majors by: a) hiring an On-Site Transfer Counselor, b) aligning the Mathematics courses across institutions, developing dual admission and dual enrollment programs, and c) creating a model articulation program in STEM majors to create a seamless transfer.
2. Create a Comprehensive Developmental Mathematics Program by: a) hiring a Director of Developmental Mathematics at each institution who will coordinate strategies and share data, b) increasing and coordinating credit-based Supplemental Instruction sessions, c) improve developmental mathematics pedagogy to include Project Based Learning, and d) creating an accelerated developmental mathematics sequence to help students move into college level mathematics more quickly.
3. Implementing Technology Innovations in Teaching Mathematics in which faculty will: a) use lecture capturing to improve students' work outside of class, b) incorporate interactive multimedia software during class to improve engagement and understanding, c) increase the use of online course support, and d) attend intensive faculty development sessions and a summer institute in technology techniques and applications.

Project activities will integrate Data-Based Decision Making, assisted by an Assessment Specialist, who will help faculty, and project leaders collect, aggregate and analyze student outcomes data each semester to ensure strategies are working towards meeting the following project objectives:

1. Increase number of students who declare majors in STEM and increase the number of students who transfer into STEM majors.
2. Improve academic performance of students in developmental mathematics by reducing the number of students with D's and F's and improving the retention rate.
3. Improve teaching and learning through technology innovations in mathematics courses, leading to increases in numbers of A's and B's in developmental mathematics courses and increasing the enrollment in college level courses.
4. Collect, analyze, and use high-quality and timely data on program participants and institutional outcomes to improve all services.

**P0311C110033**  
**New Mexico Highlands University, NM**  
**Luna Community College, NM**  
**Cooperative Development Grant**

**ABSTRACT**

New Mexico Highlands University (NMHU) and Luna Community College (LCC) are Hispanic-serving institutions (HSIs) collaborating to provide seamless evidence-based science, technology, engineering, and mathematics (STEM) programs that directly tackle barriers faced by Hispanic students primarily from northern New Mexico. The overarching goal of New Mexico Highlands University's and Luna Community College's joint project *Pathways to Achievement and Student Success (PASS) in STEM* is to increase the number of Hispanic students from northern NM with baccalaureate STEM degrees through a model transfer-articulation agreement and coordinated system of outreach and support.

Three outcome-based objectives are designed to achieve this goal:

Objective 1: Course Alignment, Sequencing and Articulation Agreement. By 2013, NMHU and LCC will establish an alignment and articulation agreement of: (a) STEM courses in LCC's Associate of Science (AS) Degree programs with NMHU's Bachelor of Science degree programs; (b) lower division lab courses; and (c) academic calendars and course scheduling;

Objective 2: Retention through Coordinated STEM Support Services. PASS students at both institutions will retain their enrollment and increase graduation rates in STEM as a result of highly coordinated support services; and

Objective 3: STEM High School Outreach through Supplemental Instructional Leader (SIL) Mentoring/Tutoring. The number of Hispanic students at Robertson and West Las Vegas Schools enrolling at NMHU/ LCC will increase annually as a result of the PASS SIL mentoring/tutoring program.

Quantitative and qualitative analyses will be conducted on PASS objectives, including a Time-Series Analysis from student data gathered three years prior to the project to predict student STEM retention and graduation rates over the five years of the program. This analysis will enable Pathways to Achievement and Student Success (PASS) to accomplish the Competitive Preference Priority of Enabling More Data-Based Decision Making as well as guide the program through implementation and accomplishment of projected outcomes.

**P031C110094**  
**Northern New Mexico College, NM**  
**Santa Fe Community College, NM**  
**University of New Mexico-Los Alamos and Taos, NM**  
**Cooperative Development Grant**

**ABSTRACT**

This proposed HSI STEM & Articulation project for 2011-2016 will establish a sustainable *Northern Rio Grande STEM Collaborative* (NRGSC) that will provide access to high quality STEM education programs for the citizens of north-central New Mexico. The Collaborative has four partner institutions: Northern New Mexico College (a unique four-year, historic HSI with community college programs and mission elements); Santa Fe Community College; and the University of New Mexico two-year branches at Los Alamos and Taos. The NRGSC responds directly and systemically to the region's economic realities: large numbers of residents live in poverty, and the economy over-relies on tourism and service industry jobs, even with proximity to the Los Alamos and Sandia National Laboratories.

The Northern Rio Grande STEM project's sweeping, comprehensive efforts comprises two major strategies:

- Expanding access by: (a) building a regional outreach effort that will inform middle and high school students about the benefits and opportunities presented by STEM education programs; (b) conducting region-wide STEM Summer Bridge Programs for incoming first-year students at each institution; (c) increasing the number and skills of faculty advisors; (d) expanding STEM articulation and transfer efforts among the partner institutions to strengthen the pathways into our STEM Bachelor of Science programs; and (e) expanding retention-related services to STEM students.
- Expanding programmatic infrastructure by: (a) adding key faculty in areas of need at each institution and developing a system for sharing courses and faculty across the institutions; (b) providing STEM faculty with professional development experiences that will improve pedagogy and thereby learning outcomes in STEM fields; and (c) building new distance education capacity (both online and ITV) for reaching students across this far-flung region.

The Project will have measurable and significant outcomes, such as a significant increase in the number of Hispanic and other students entering and succeeding in STEM associates and baccalaureate degrees; and significant increases in the number of students enrolled in and completing STEM courses at all four partner institutions.

**P031C110106**  
**University of New Mexico, NM**  
**Central New Mexico Community College Science, NM**  
**Cooperative Development Grant**

**ABSTRACT**

University of New Mexico (UNM) and Central New Mexico Community College (CNM) have partnered to improve systematic pathways and increase student 2/4 transfer to technical education opportunities that adequately prepare Hispanic and low income students for STEM careers. The impact of this proposal on the successful STEM enrollment, retention, transfer and graduation of Hispanic and low-income students is important to New Mexico. The two institutions are geographically located to serve the majority of the Hispanic and low-income population in the state of New Mexico.

UNM is a public, four-year degree-granting institution located in Albuquerque, New Mexico and is the lead institution in the proposal. Current enrollment is 34,674 students at UNM, which is one of only two research/doctoral-extensive institutions in the country to also be designated as a Hispanic-serving institution. Partnering institution, CNM is the largest post-secondary two-year educational institution in New Mexico. Located within a mile of each other, the two partnering institutions are the most centrally located institutions serving the largest number of Hispanic and low-income students within the state. The potential for this partnership to establish the best model for 2/4 transfer and degree articulation is promising.

Utilizing existing expertise, services, and current research, the STEM UP project will focus on the research findings which state key factors in enhancing services to Hispanic, low-income, and first generation college students. The Pell Institute (2011) *Bridging the Gaps* research report states that creating a “structured pathway, student centered culture, and culturally sensitive leadership” are key to successful 2/4 transfer. Incorporating research findings for success with enhanced focus on STEM degree articulation, the STEM project will assist students in navigating newly created degree articulation agreements. Specialized advisement and student advocates at both institutions will create a *structured pathway*. Secondly, the project will have centers on each campus that house specific STEM services such as advisement, tutoring and peer mentors. The STEM Centers will create a smaller, culturally sensitive learning community within the two very large institutions, with flexible hours and services that will make a highly *student-centered* place of belonging. Finally, the project leadership is composed of *culturally sensitive professionals* who are Hispanic and from similar backgrounds, who truly understand the target population. These measures ensure that the services provided are relevant to the success of Hispanic, low-income students in STEM fields.

The true strength in the proposed STEM UP project is the collaborative approach of CNM and UNM to combine resources and efforts to create both a transfer-going culture at CNM and a transfer-receptive culture at UNM. Services will be offered from one unit across both institutions, resulting in a seamless pathway in student services and support for transfer STEM students. The project’s culturally sensitive leadership will make decisions based on student awareness and data. Data will be collected on impact of services, utilization of services, institutional changes that accommodate students, and success in increasing Hispanic and low-income student enrollment, transfer and graduation in STEM fields. This data will be used for continuous improvements of services and enculturation of services at both institutions.

**P031C110181**

**Inter American University of Puerto Rico – Barranquitas, PR**

**EDP College of Puerto Rico**

**Cooperative Development Grant**

### **ABSTRACT**

The project is titled, *Ensuring Hispanic Students Success in Attaining STEM Careers*. The main goal of this project is to create for the Hispanic student an environment that supports intellectual growth in life sciences, engineering, and computer sciences. This means to provide high quality support services to reduce the failure rate in STEM careers and engage our students in challenging learning experiences.

This project addresses the absolute priorities of the HSI STEM and Articulation Programs by increasing the number of Hispanic students attaining degrees in STEM careers and by this cooperative project which involves developing a transfer and articulation agreement between Inter American University of Puerto Rico Barranquitas Campus (IAUPR-BC) and EDP College of Puerto Rico (EDP). It also meets the competitive preference priority by collecting and analyzing students' performance data as part of the process to promote student success in STEM careers.

The focal points of the proposal are the following: 1) the establishment of an articulation and transfer agreement between Inter American University of Puerto Rico Barranquitas Campus and EDP, 2) increase in 36 percent the number of new students in the Science and Technology Department at Inter American University of Puerto Rico Barranquitas Campus, 3) recruit 45 students in a new associate degree in Biotechnology at EDP, 4) increase to at least 70 percent the retention rate of students from the first to the second year in STEM careers at Inter American University of Puerto Rico Barranquitas Campus and EDP, 5) increase graduation rates in life sciences, engineering, and computer sciences from 21 percent to an average of 30 percent for those students completing their degree in six years, and 6) strengthen curriculum in STEM fields by curriculum articulation, faculty development, and research/problem based learning.



**P031C110195**

**Universidad Politécnica de Puerto Rico, PR  
Instituto Tecnológico de Puerto Rico, PR  
Cooperative Development Grant**

### **ABSTRACT**

Universidad Politécnica de Puerto Rico, (UPPR) and its partner, Instituto Tecnológico de Puerto Rico (ITPR), both Hispanic-serving institutions, propose a cooperative. The project, titled, *Forjando Alianzas para el Éxito Hispano: Forging Alliances for Hispanic Success*, is an extension of the institutions' longstanding commitment to Hispanic, low-income, and other non-traditional student populations, and reflects the compatibility of their programs.

Universidad Politécnica de Puerto Rico, the lead institution and fiscal agent, is a private, non-profit university offering an array of accredited programs. The University is located in the Hato Rey district of San Juan. Instituto Tecnológico de Puerto Rico is the premier public two-year technical college in Puerto Rico, offering a wide variety of engineering technology and other technical programs at four campuses on the main island of Puerto Rico. Together they serve nearly 10,000 Hispanic or Latino students annually; some two-thirds of Universidad Politécnica de Puerto Rico students are eligible for and receiving need-based federal student aid, while more than 90 percent of Instituto Tecnológico de Puerto Rico students do so. The convergence of their curricular interests makes Universidad Politécnica de Puerto Rico and Instituto Tecnológico de Puerto Rico ideal partners for articulation of programs, and a shared commitment to non-traditional and disadvantaged students provides compatibility of philosophy and approach.

Universidad Politécnica de Puerto Rico and Instituto Tecnológico de Puerto Rico propose to address identified problems, gaps and weaknesses through three complementary initiatives:

- (1) Increasing the rate of STEM transfer from Instituto Tecnológico de Puerto Rico to Universidad Politécnica de Puerto Rico through development of a *Connections* program emphasizing improved pre-transfer preparation, articulation of compatible programs, transitional services, and student success initiatives.
- (2) Increasing access to Universidad Politécnica de Puerto Rico engineering programs by developing online and hybrid delivery options for required math and science courses and basic engineering courses that concurrently enrolled Instituto Tecnológico de Puerto Rico students and others can take asynchronously and at distant locations.
- (3) Developing online student and academic support services and improved in-person and online services to increase rates of enrollment, course completion, retention, and graduation.

In undertaking this cooperative project, Universidad Politécnica de Puerto Rico's strong engineering programs and capacity for management of course conversion processes and distance delivery technologies will be indispensable assets. Instituto Tecnológico de Puerto Rico's compatible lower-division technical curricula and geographic reach through its four distributed campus locations make it the ideal partner for this effort.

**P031C110039**

**Alamo Community College District-San Antonio College, TX**

**Sul Ross University, TX**

**Cooperative Development Grant**

### **ABSTRACT**

San Antonio College (SAC) and Sul Ross State University (Sul Ross) propose the *Adelante Tejas (Forward Texas) partnership for South Central and rural Southwest Texas*.

#### **Activities:**

**For Improved Access:** 1) establish at least nine articulation agreements between San Antonio College and Sul Ross; 2) develop new academic and career planning workshops; 3) develop a STEM academic/professional career development “pathfinder” Web module to help students find the right STEM discipline/career; 4) joint San Antonio College-Sul Ross faculty activities; 5) develop research opportunities for San Antonio College students at Sul Ross; 6) develop online and/or hybrid upper-level geology and biology courses for distance delivery to students in San Antonio from Sul Ross; and 6) San Antonio College will provide a distance undergraduate course currently unavailable at Sul Ross due to limited faculty availability to accelerate STEM degree completion at Sul Ross

**For Improved Quality of STEM Education:** 1) conduct faculty professional development workshops and week long Summer Institutes to educate faculty about STEM student advising, new methods of delivering distance education, use of new technology to improve STEM education in the classroom, STEM best practices in teaching, and discipline-specific content update; 2) equip labs at Sul Ross with X-ray equipment; 3) offer faculty stipends to revise curricula for distance delivery, curricular alignment, or enhancement with research/inquiry activities or other best practices; 4) develop a joint Summer Field Study research experience for San Antonio College students at Sul Ross/Big Bend; and 5) increase STEM offerings at both institutions via distance education.

**For Improved Student Support:** 1) provide early academic and career advising to STEM majors in weeks before semesters using out-of-contract faculty stipends; all San Antonio College earth sciences faculty will advise students for the first time; 2) expand the Math Engineering and Science Center, MathSpace, BioSpot and GeoSpot Centers and/or increase the hours of tutoring they offer; 3) build endowments at both institutions.

**P031C110142**  
**Angelo State University**  
**Howard County Junior College**  
**Cooperative Development Grant**

**ABSTRACT**

Angelo State University (ASU) is taking the lead in a west Texas collaborative project with Howard County Junior College District (HC) to increase, by 20 percent over five years, the number of Hispanic students who enroll, transfer and obtain science, technology, engineering, and mathematics (STEM) degrees. The primary service area for ASU and HC focuses on 23 counties in rural west Texas whose regional population is 38 percent Hispanic, with many school districts over 50 percent Hispanic. ASU is the only public four-year institution of higher education within a 100-mile radius of San Angelo, and HC is the only two-year college in the region. In fall 2010, ASU enrolled 6,155 undergraduate students who were 26 percent Hispanic.

The main campus of HC district is 90 miles north of San Angelo and a second HC district campus is located in San Angelo, within seven miles of ASU. Students on the HC district -San Angelo campus near ASU are 42 percent Hispanic. Service areas for ASU and HC overlap geographically, but services to students between the colleges are poorly integrated, and there are widening gaps in postsecondary achievement among students living in the low-income Hispanic communities that are pervasive in West Texas.

Services Overview: Together ASU and HC will work to implement four project components to address the low number of Hispanic and low income students who earn four-year degrees in STEM fields, addressing analyzed deficits at both institutions which are hampering transfer: (1) STEM outreach to K-12, families and the community; (2) Smoothing STEM transfer pathway through increased access, student support, curriculum alignment and articulation; (3) Improve Science and Math Labs via renovation and equipment upgrades; and (4) Improve STEM access through faculty development. Strategies and activities in each of the project components are designed to achieve success in STEM degree completion at both the two-year and four-year level and to open new pathways for transfer.

**P031C110143**  
**El Paso Community College, TX**  
**Texas Tech University, TX**  
**Cooperative Development Grant**

**ABSTRACT**

El Paso Community College (EPCC) and Texas Tech University (TTU) have jointly implemented *2+2 Model Articulation in Architecture* that is unique in the nation for its model articulation practices and emphasis on program development based on local community and student needs.

The 2+2 Articulation in Architecture will develop and expand the program to reach its full potential as a national model for science, technology, engineering, and mathematics (STEM) programs, including taking prescribed actions in order to jointly meet the National Architectural Accrediting Board (NAAB) standards. These standards were not applicable to EPCC in the past, but will be required in order to fulfill the objectives of a national, replicable, 2+2 model for community college and university partnerships in the field of architecture.

This model program will:

- 1) Increase the number of Hispanic and other low income students attaining degrees in the STEM fields; and
- 2) Develop model transfer and articulation agreements between two-year Hispanic serving institutions and four-year institutions in such fields.
- 3) Allow for more data-based decision making.

Specific activities will include expanded advising for architecture students, tutoring and peer mentoring, faculty development, and construction of a joint-use facility for the EPCC and TTU architecture programs. The EPCC and TTU 2+2 architecture program has the potential to alter the profile of professional education in architecture across the state of Texas.

**P031C110128**

**University of St. Thomas, TX**

**Houston Community College, TX**

**Cooperative Development Grant**

### **ABSTRACT**

Founded in 1947, the University of St. Thomas (UST), a designated Hispanic-serving institution (HSI) serving 3,520 students annually, is an independent Catholic university located in downtown Houston, Texas. The cooperative partner institution, Houston Community College System (HCCS), is a public two-year system of six community colleges under one system administration. HCCS, a designated HSI, is the second-largest community college in the US. More than 75,000 students enroll at HCCS every semester. As HSIs, UST and HCCS face academic, institutional and fiscal challenges in meeting the needs of Hispanic and low-income students who wish to pursue STEM education and degree completion.

Student and Faculty Profile: as of fall 2010, the UST undergraduate student headcount was 1,627, with 36percent of enrolled students reporting Hispanic ethnicity. Over 91percent of the full-time faculty hold a terminal degree in their field. UST has 145 full-time faculty and 151 part-time. HCCS has 73,606 students as of fall 2010, with the Hispanic student body totaling 28.8percent. HCCS currently has 897 full-time and 2,698 part time faculty members.

Academic, Fiscal and Institutional Weaknesses at UST / HCCS: enrollment at UST has declined since a high in 2004, leading to a loss in tuition revenues which directly impacts the operating budget. Transfer students rates have remained stagnant for the past five years and graduation rates for HCCS transfer students at UST are only 48percent. During this time of non-funding for enrollment increases, HCCS will experience a \$26 million loss that directly impacts student access. Both institutions must add critically-needed services and programs to increase the retention and completion rates of Hispanic and low-income students in high demand STEM fields.

Project Outcomes: the partners propose three activities to increase the participation, retention, transfer rates and completion of Hispanic and other low-income STEM students:

- 1) Develop a faculty-driven, robust transfer program with new model articulation agreements. This activity includes adding new online tutoring services at UST which align with current services at HCCS, adding a STEM Transfer Coordinator, as well as mentoring and outreach conducted by faculty, mentors and peers to increase student engagement in STEM. A STEM scholarship endowment will be created at both institutions and revenues will be increased through new transfer enrollments, strong retention and external funding;
- 2) Create a new year-round UST / HCCS undergraduate research program. Student learning, retention, and completion will be increased through improved teaching / learning strategies, increased STEM faculty engagement and peer mentoring and tutoring. Five STEM labs at HCCS campuses will be aligned with UST STEM labs to provide a seamless transition to baccalaureate-level coursework, and
- 3) Utilize data-driven strategies to improve student outcomes by adding an assessment coordinator to expand UST assessment services for ongoing assessment of STEM programs, integrating STEM faculty in the process and implement program level assessment strategies in order to improve outcomes related to enrollment, persistence, and completion of STEM degrees.

**P031C110145**  
**University of the Incarnate Word, TX**  
**St. Phillips College, TX**  
**Cooperative Development Grant**

**ABSTRACT**

The overarching purpose of University of the Incarnate Word's project is to carry out activities that increase the number of Hispanic and other low-income students who receive a bachelor's degree in science, technology, engineering, and mathematics (STEM). University of the Incarnate Word's partner in this collaborative arrangement grant is St. Philip's College (SPC), a two-year Hispanic-serving institution (HSI) also located in San Antonio.

This project will accomplish six unified objectives over the course of the project period as well as three activities supported by a series of tasks. One focus of this project will be to improve performance in core STEM courses, which often serve as gatekeepers to progression, and consequently, successful completion of the STEM major.

Many of the project tasks will be to improve student performance in gatekeeper courses through joint faculty development in collaborative learning, an evidenced-based teaching technique. Another task will be reunion and class visits in which faculty at each institution visit classes of their colleagues at the other institution to see best practices in action. In addition, the project partners will create model articulations in STEM via the formation of a joint Articulation Task Force in year one. This group will analyze course content of lower division courses offered at St. Phillips College and improve alignment with upper division courses at University of the Incarnate Word. Modifications to courses will be made by the Task Force, then implemented during year two and evaluated regularly thereafter.

Other major tasks include continuing and expanding Peer-led Assisted Supplemental Learning program to more STEM disciplines to help improve student academic performance. Innovative curriculum development will also be part of this project. Funding will be used to purchase sophisticated micro-computer based technology that students will use to collect and analyze scientific data collected in the field. Equipment and scientific instrument purchases are an important component of this project. These purchases will increase in the number of existing classrooms and laboratories that meet national standards in which Hispanic and low income STEM students can conduct research and receive high-quality training.

Lastly, this project meets the competitive preference priority of enabling data-based decision making. University of the Incarnate Word has powerful new software called Tableau that will allow the project director and project evaluator to conduct ongoing assessments of STEM student enrollment and performance by an array of demographic variables.

**P031C110048**  
**Arizona Western College, AZ**  
**Individual Development Grant**

**ABSTRACT**

*Pipeline to STEM Success* is an innovative endeavor by Arizona Western College (AWC) to increase the number of Hispanic and low-income students attaining science, technology, engineering, and mathematics (STEM) degrees in Southwest Arizona by: (1) inspiring students to engage in STEM discovery and innovation; (2) developing a world-class STEM workforce talent pool; (3) attracting and retaining STEM talent through a dynamic and innovative school environment; and (4) Delivering coordinated, collaborative and cohesive STEM programs. Pipeline is centered on equipping students with ‘21st century skills’ for academic success, such as critical thinking, problem solving, creativity, and communication while broadening the range of high-quality STEM degree options.

This will be achieved by tailoring academic support to meet the needs of underrepresented minority and low-income students, including: supplemental instruction; curriculum redesign and development of innovative courses that utilize the latest technology. Hands-on, real-world experiences will allow students to make connections between courses, disciplines, technology, and the larger world. Also included are outreach and advising support designed to augment existing systems to ensure greater cohort graduation success rates; and state-of-the-art facilities and equipment that will assist students to gain skills to be competitive and academically successful.

The proposal is vital to meeting local community workforce needs, by building an articulation/transfer model that will allow Northern Arizona University Yuma Branch Campus to offer a Bachelor of Applied Science in Industrial Technologies and thus providing access to higher education STEM opportunities in an area that is severely restricted due to geographic, socioeconomic, and academic barriers. It will also engage and equip a new population of students to pursue STEM studies by opening a pipeline to STEM success from applied sciences, through development of enhanced STEM transfer programs and degrees.

Arizona Western College, in Yuma, Arizona is a two-year, publicly supported Hispanic-serving institution that serves nearly 13,000 students annually, with a 53 percent Hispanic student population. The service area is remote and the poverty rate is 43 percent higher than the national average and baccalaureate degree completion rates are extremely low. At the same time, many of these STEM vacancies are filled by individuals from out of the area because a trained work force is not available in Yuma.

**P031C110162**  
**Central Arizona College**  
**Individual Development Grant**

**ABSTRACT**

Central Arizona College is a growing community college and Hispanic-serving institution in Pinal County, Arizona. Central Arizona College draws its enrollment from an impoverished, undereducated area slightly larger than the state of Connecticut (5,300 square miles). Less than 150 miles from the U.S. border with Mexico, Pinal County (population 368,000) is one of the most rapidly growing Hispanic regions in the United States.

This HSI STEM & Articulation Programs project confronts the unacceptably low rates at which Hispanic and other low-income students enroll, persist and succeed in our institution's science, technology, engineering, and mathematic (STEM) academic classes and degree programs. More than half of all our first year STEM students do not return for the second year. The project will also confront the low rates of graduation from our science, technology, engineering, and math programs and transfer to STEM degree programs at Arizona's state universities.

To address these significant problems, we are proposing an activity that:

1. Enhances the transfer pathway for microbiology and biotechnology by making improvements to instruction and curriculum in our biology classes and by providing equipment and supplies that support student engagement and scientific inquiry.
2. Develops a new biology course that will articulate for credit with state universities and transfer to several biology and microbiology courses at these institutions.
3. Implements a comprehensive, coordinated experience for STEM students. This program will involve supplemental instruction, master academic plans, tutoring, additional academic advising, peer mentoring, and summer programming that orientate students to college and prepare them for college life.
4. Provides financial literacy and financial aid seminars and a textbook loan program for science, technology, engineering, and math students.
5. Provides mathematics enrichment and refresher courses that will increase the number of new students going directly to college math level classes for algebra and calculus.
6. Provide summer science classes designed to foster greater interest and enrollment in science, technology, engineering, and math programs.
7. Provides faculty with professional development in instructional pedagogies that are effective with Hispanic and low-income students and that promote scientific inquiry and student engagement.
8. Expands the media capturing (recording) for science and math classes, so that students are able to repeatedly review lecture materials for increased understanding and are better able to access classes.



**P031C110088**  
**Pima Community College, AZ**  
**Individual Development Grant**

**ABSTRACT**

STEM Advising, Career Planning, Transfer program and STEM Facilities Renovation

Pima Community College-West Campus (PCC-West), in Tucson, Arizona, is a two-year, publicly-supported college serving some 13,000 students per semester, with a 35percent Hispanic enrollment (4,484 Hispanic students in Fall 2010) and a large number of low-income students (approximately 9,000). Its service area (Tucson and surrounding Pima County, with a population exceeding 1 million) is approaching a majority Hispanic population.

PCC-West students, particularly Hispanic students, are failing foundational math and other science, technology, engineering, and mathematics (STEM) courses at an alarming rate, with the result that degree completion rates in STEM-related degree programs are extremely low and transfer rates are at minimal levels.

Consequently, PCC-West students are woefully unequipped to enter high-paying jobs in Tucson's multitude of STEM industries, which includes a huge aerospace/defense industry, drawn to the region by two large military bases –Davis Monthan Air Force Base near Tucson and Fort Huachuca in Cochise County. The aerospace industry employs more than 30,000 people through companies such as Raytheon, General Dynamics, and Lockheed. The largest employer in the region - Raytheon Missile Systems - employs 12,500 people in PCC-West's service area alone (*TREO*, 2010). Meanwhile, the region also supports an emerging solar industry, a large analytical instruments/optics industry, and a thriving, nationally-recognized bioscience industry.

PCC-West – a major college entry point for Tucson's Hispanic and low-income students – is determined to improve students' preparation for high-paying jobs in these STEM-related industries. To accomplish this mission, PCC-West will strengthen its STEM curriculum by integrating new, more effective teaching strategies, tutoring, and technologies into the curriculum; strengthen its support for Hispanic and other low-income students by adopting a strong STEM advising, career planning, and transfer program; and articulate key engineering programs with the University of Arizona. The College will also regenerate its STEM facilities (and instructional support) through remodeling projects that will create modern classrooms to support *collaborative, inquiry-based* learning.

The overall goals of the project (over five years) are to decrease the failure rates of Hispanic and students and all students (who are predominantly low-income students) in foundational math and other STEM courses by seven percentage points, to double the number and percentage of Hispanic students and all students who complete STEM related degrees, to double the percentage of Hispanic and all students who transfer to a four-year university, and to complete and implement at least three model articulation agreements and a related transfer program in Engineering with the University of Arizona.

**P031C110074**  
**Allan Hancock College, CA**  
**Individual Development Grant**

**ABSTRACT**

*STEM Select* promotes selecting Allan Hancock College as a viable path toward a baccalaureate, selecting a science, technology, engineering, and mathematics (STEM) field of study, selecting teaching as a career option, and becoming part of a select cohort of students whose success will be supported by faculty and peer mentors. The project creates a model pathway from high school to Allan Hancock College to university. Five institutional strategies of model Hispanic-serving institutions provide the guiding principles shaping the project: community outreach, academic support, use of data in decision-making, faculty development, and establishing transfer pathways.

Enhancing Allan Hancock College's STEM resources and infrastructure will increase student retention. Key community outreach activities include hosting a Summer of Science Camp, a pre-college Math Academy, and on-going Science Night project-based learning events. Academic support will be provided in a new STEM Center with a dedicated STEM counselor and experts providing STEMinars. Faculty Inquiry projects in the classroom will result in pedagogical improvements that engage students and increase persistence.

Establishing transfer pathways between Allan Hancock College and California Polytechnic State University will result in an increased number of Hispanic students who perceive in high school that transferring to a selective university is within their reach and will put an infrastructure in place to diversify California's STEM teaching workforce. In this way, the project addresses the purpose of the HSI STEM & Articulation program to improve and expand Allan Hancock College's capacity to serve Hispanic and low-income students.

Both absolute priorities will be met in Allan Hancock College's proposed initiative. Under *Priority 1*, Allan Hancock College will increase by 20 percent the number of Hispanic and low-income STEM majors who are on the pathway to complete a baccalaureate degree. Under *Priority 2*, Allan Hancock College will partner with California Polytechnic State University to remove institutional obstacles on transfer pathways between high school and Allan Hancock College and between Allan Hancock College and CPSU, resulting in a 10 percent increase in the number of STEM students who transfer each year. The *competitive preference priority* will be met as Allan Hancock College and California Polytechnic State University employ the Center for Urban Education's nationally recognized methods for performance and diagnostic benchmarking to increase Hispanic students' persistence and completion. The goal of the project is to enhance Allan Hancock College's capacity to increase enrollment and transfer opportunities for students and remove the institutional barriers limiting the success of students underrepresented in STEM fields.

**P031C110091**  
**Antelope Valley College, CA**  
**Individual Development Grant**

**ABSTRACT**

Antelope Valley College (AVC) is a public two-year California community college that serves the westernmost region of the great Mojave Desert between the Tehachapi Mountains and the San Gabriel Mountains in a single college district 70 miles northeast of Los Angeles. Antelope Valley College serves over 22,000 students annually with over 65 percent from racial/ethnic minority groups - Hispanics making up the largest group (over 31 percent of enrollment and growing rapidly). The Antelope Valley College Palmdale Center provides the only access to higher education for the predominantly Hispanic community in the area which has traditionally been educationally underserved. However, the Palmdale Center currently offers no science, technology, engineering, and mathematics (STEM) degree programs and therefore cannot meet the workforce needs of the area which reflect a heavy aerospace industry presence. Increasing Hispanic STEM degree completion by developing a more effective pathway, including improved early outreach in a high-need and underserved area and more seamless articulation with California State University, Bakersfield is the primary objective of the proposed project.

**Major Measurable Objectives for completion by September 30, 2016:**

- 1. Achieving Equity in STEM Enrollment.** (a) To enroll 50 Hispanic and low-income students in Antelope Valley College's Early STEM Academy; and (b) To identify 50 first-time, degree-seeking students each year at the Palmdale Center who show intent by obtaining an individualized STEM degree pathway roadmap.
- 2. Achieving Equity in Early Math Success.** (a) To report a 70 percent average pass rate in redesigned remedial math courses; and (b) To reduce the average time students spend in remediation by two semesters through improved early preparation and accelerated/ modularized remedial math.
- 3. Achieving Equity in First Year Retention.** (a) To increase the fall to spring retention rate of STEM Pathway Students by 20 percent; and (b) To increase the fall to fall retention rate of STEM Pathway Students by 20 percent.
- 4. Achieving Equity in Pathway Milestones.** (a) First year milestone: 55 percent of STEM Pathway Students will successfully complete at least 20 hours in the first year after enrollment; (b) Second year milestone: 45 percent of STEM Pathway Students will successfully complete at least 30 transferrable credit hours in their first two years after enrollment; (c) To develop at least 10 research and internship opportunities; and (d) Transfer milestone: To achieve at 35 percent transfer rate of STEM Pathway Students in STEM fields.

**P031C110005**  
**Cabrillo College, CA**  
**Individual Development Grant**

**ABSTRACT**

Cabrillo College, a Hispanic-serving institution in Santa Cruz County (population 262,382) California proposes to significantly scale up and centralize STEM student support services and activities to facilitate broader participation, greater persistence and higher rates of transfer into baccalaureate programs. Nearly one third (32 percent) of county residents are Latino with Cabrillo's Watsonville Center (13 miles from campus) serving Watsonville (population 50,269), a historically diverse (79 percent Latino) community with high unemployment (29.2 percent) and lower socioeconomic status.

The proposed project is building on what works specific to high need low-income and Latino students. Its design has five key components intended to effectively address gaps and weaknesses in STEM facilities and resources to meet the needs of individuals who are Latino, at risk of educational failure and economically disadvantaged: 75 percent low-income and first-generation college; 82 percent first-generation college Latino; 52 percent Latino five-year average math, chemistry and physics success rate; 38 percent Latino persistence rate in STEM programs. The proposed project design and services reflect a multipronged approach most likely to successfully meet the needs of Cabrillo College students.

1. **STEM Summer Bridge Program** highlighting different STEM industries each year, hands-on lab experiences and opportunities to develop an individual degree/transfer plan.
2. **New STEM Center** with stepped up academic support (peer led supplemental instruction and tutoring in math and science) and proactive academic and transfer advising, including developing a transfer plan and receiving financial aid assistance.
3. **Expanded and improved engineering and computer science laboratory** spaces and resources to promote hands-on/total engagement experiences for students.
4. **A model articulation/transfer initiative** involving five four-year transfer institutions to align engineering and computer science courses and develop articulation agreements for three engineering transfer pathways. Transfer guides developed for students and parents.
5. **A comprehensive STEM database** accessible at the administrative, program and instructor level for timely use of STEM student outcomes to assess effectiveness of services and activities and to make evidence-based improvements and decisions.

**P031C110026**

**California State University – Bakersfield, CA  
Individual Development Grant**

**ABSTRACT**

California State University, Bakersfield (CSUB), currently enrolls over 6,000 undergraduates, almost 37 percent of whom are Hispanic. CSUB is the only four-year degree granting campus within a 100 mile radius of its service area which has one of the fastest growing and most economically depressed populations in California. The main campus is located on a 375 acre site, which was donated by the Kern County Land Company to the State of California for the university. California State University, Bakersfield's mission today is shaped by the enormous STEM education needs of service area residents and local industry.

Goal 1: To develop a new, high quality engineering sciences degree program, with two new tracks in biological engineering and engineering management, that is consistent with the principles of modern, more accessible engineering education and meets accreditation standards.

Goal 2: To develop a Center for Collaborative Interdisciplinary Teaching and Research to accelerate the establishment of a modern engineering education program at CSUB; this will produce equitable learning and degree completion.

Goal 3: To develop a model transfer and articulation agreement with California State University-Bakersfield's main partner to establish a seamless intersegment engineering sciences degree pathway.

Objective 1: To triple the number of engineering degree pathway students at California State University- Bakersfield, from 98 in spring 2011 to at least 294, with Hispanic students equitably represented relative to total enrollment.

Objective 2: To report a 40 percent six-year graduation rate in California State University-Bakersfield's engineering degree program, with the degree completion equity gap 100 percent eliminated.

**How Project Addresses Priorities**

(1) To increase the number of Hispanic and other low income students attaining degrees in STEM fields.

(2) To develop model transfer and articulation agreements between two-year Hispanic-serving institutions and four-year institutions.

(3) Enabling More Data-Based Decision-Making. Projects under this priority are designed to collect (or obtain), analyze, and use high-quality and timely data, including data on program participant outcomes, in accordance with privacy requirements, in the following priority area: Improving postsecondary student outcomes relating to enrollment, persistence, and completion and leading to career success. This project is a major step toward meeting the magnitude of local STEM needs, but this is a long term commitment.

**P031C110151**

**California State University – Long Beach, CA  
Individual Development Grant**

### **ABSTRACT**

**Statement of the Problem:** The purpose of the *Promotores de STEM* for the Colleges of Natural Sciences and Math (CNSM) and Engineering (COE) is to ameliorate the lack of highly qualified first generation-educated Latino graduates prepared to engage in graduate degrees in science and engineering disciplines. Latinos have been and continue to be gravely underrepresented in the natural sciences, technology, math, and engineering related disciplines. Only three percent of scientists and engineers in the United States are Latinos, while currently half of California's population under the age of 18 is Latino. Although Latinos represent a growing proportion of college admissions, they continue to lag behind in enrollment and degree completion (Becerra 2010). Entry-level science courses (e.g., chemistry, biology, math and physics) tend to eliminate Latino students from advancement in STEM degrees. In response to this critical educational deficit, and with support from the Hispanic Serving Institution STEM Initiative, the CNSM, COE, and the NCLR/CSULB Center for Latino Community will develop the CSULB HSI STEM program.

**Objectives:** The objective of the CSULB HSI STEM program is to increase the number of under-represented Latino students attaining highly valued degrees in the fields of science, technology, engineering or mathematics, including transfer students from two-year HSI institutions. Building on our past successes and national leadership in student-centered learning, this program intends to increase the number of well-trained scientists and engineers needed to serve our nation and world. With a focus on student success measured by retention, progress toward degree, and graduation, CSULB will further cultivate a campus environment that is student-centered, service-oriented, data-driven and globally engaged.

**Methodology:** The methods utilized in the CSULB HSI STEM program are: 1) building upon a successful CSULB peer *promotores de educación* model to establish *Promotores de STEM* for the CNSM and COE; 2) adapting our current faculty development programming in culturally responsive pedagogy to STEM specific disciplines; 3) engaging Latino STEM students in summer programs, annual advising, participation in learning communities, supplemental instruction and tutoring; 4) providing transfer Latino students with an understanding of and appreciation of research experiences that assist in leading to careers in STEM fields; 5) introducing STEM students to a research experience and the process of discovery; and 6) connecting them to a faculty mentor and other students in their major and creating a community of engaged learners.

**Ability to Implement the Project:** CSULB is among the nation's top 10 annually in conferring bachelor's degrees to students of color and fourth in the nation for awarding mathematics and statistics graduate degrees to minority students, according to *Diverse Issues in Higher Education* (2010). We have assembled a university-wide, exemplary bicultural and bilingual project team, whose members have a clear understanding of the methods, university resources, and knowledge of how to successfully implement strategies that fit the needs of Latino students. Our nationally recognized Long Beach Education Partnership comprised of Long Beach Unified School District, Long Beach City College, and California State University - Long Beach (CSULB), provides the supportive framework for increasing the number of Hispanic and other low-income students to attain degrees in science, technology, engineering, and math disciplines. Furthermore, the articulation agreements that the university has in place will provide the springboard for enhancing services provided to Latino students.

## **P031C110121**

### **California State University – Monterey Bay, CA Individual Development Grant**

#### **ABSTRACT**

California State University, Monterey Bay (CSUMB) is a young and growing Hispanic-serving institution with an academic mission to help prepare students, especially those from under-served populations with the knowledge and skills necessary to build meaningful and successful lives. From its vision to its operations, CSUMB is organized specifically to foster the identification, recruitment, and success of Hispanic, and other underrepresented and low-income undergraduate students.

This project, proposed under the U.S. Department of Education's HSI STEM & Articulation Program, will address three overarching goals: 1) Increase the number of Hispanic and low-income science, technology, engineering, and mathematics (STEM) students transferring from Hispanic-serving community colleges to CSUMB; 2) Increase the number of Hispanic and low-income students attaining Bachelor of Science degrees from CSUMB in STEM fields; and 3) Employ Data-Based Decision-Making to inform decisions, assess performance, and provide effective feedback for continuous improvement and production of high quality products and services. These goals will be measured against a robust set of performance indicators related to student transfer rates, enrollment, persistence, retention, and graduation.

This program capitalizes on CSUMB's new and growing STEM majors and minors. Within the five-year scope of the project the university will launch a new B.S. degree in Marine Science, develop new minors in Chemistry and Statistics, fortify young majors in Biology and Computer Science, and restructure its Environmental Science, Technology & Policy B.S. degree. Increases in STEM transfer rates will be achieved through a combination of: stronger connections between CSUMB and HSI community colleges, institutional and process improvements for articulation and transfer, and stronger, more immediate links between transfer students and CSUMB's faculty, students, and programs. Increases in Hispanic and low-income STEM student performance, retention, and resulting graduation rates will be achieved through:

- 1. Extensive curriculum development and enhancements to the new STEM majors* that utilize the latest technology and teach through hands-on, inquiry-based, real-world experiences.
- 2. Tutoring support and Course Assistants* that emphasize group-work, problem solving, and critical thinking to increase student success and foster a sense of community within the STEM majors.
- 3. STEM faculty development* to improve writing instruction and assessment in STEM courses.
- 4. Student enrichment* that allows students to make connections between courses, disciplines, and the profession, and enables students to contextualize their learning and demonstrate subject mastery.

The impact of these activities goes beyond individual students, courses, and faculty to the level of institutional change. The project presents a unique opportunity to grow and enhance our young and vibrant STEM programs at CSUMB, increase the number of Hispanic and low income students pursuing productive leadership careers in STEM disciplines, and make a profound and lasting institutional impact that will continue long beyond the scope of the grant.

**P031C110164**  
**Cerritos College, CA**  
**Individual Development Grant**

**ABSTRACT**

Cerritos College will pilot a program of associates of arts degree attainment and university STEM transfer, concentrating on the high-need areas of Computer Science and Environmental Science. These areas offer rewarding career opportunities, but the region's Hispanics remain underrepresented in the workforce due to barriers of math achievement, educational pathways, and a weak educational pipeline.

Cerritos College will address: the absolute and competitive preference priorities of increased degree attainment and transfer by developing science, technology, engineering and mathematics (STEM) articulation agreements with universities and using project data to enable decision making for future pro-grams/student support; the "math barrier" by improving the performance of students who test below college level in math who achieve transfer-level in two years, and increase success in developmental courses; weakness in articulation by aligning courses and programs in Computer Science (including streamlining existing degrees to reduce completion time), and develop/articulate an Environmental Science associates of arts, including articulated research/ field experiences; and deficiencies in the pipeline and institutional support structures by enhancing outreach to high schools; create a Bridge Program, develop academic support services in the Student Success Cerritos College Center; provide case management transfer advising for STEM students.

By 2016, we anticipate significant increases of Hispanic students awarded a STEM associate of arts, and transferring in science, technology, engineering and math to a university; and in success rates by Hispanic students in key gate-way math courses. The project will also result in the identification of best practices for institutionalization and that will and informs future efforts to serve Hispanics and other underrepresented students.



**P031C110019**  
**Citrus Community College, CA**  
**Individual Development Grant**

**ABSTRACT**

Citrus College (Citrus) Glendora, California located in the east side of the greater Los Angeles area is a two-year single district public community college. The project is titled, ***R. A. C. E. To Science, Technology, Engineering, Mathematics (Rise Above Challenges Exponentially)***.

To increase the number of Hispanic and other low income students attaining degrees and/or transferring in the fields of science, technology, engineering, and mathematics (STEM), Citrus proposes to implement three components in the project: Get Ready! – Strengthening pre-collegiate preparation in STEM and data-based decision making through effective student tracking; Get Set! – Enhanced academic services to improve quality of teaching and learning through Faculty Inquiry Groups, STEM Learning Communities and Supplemental Instruction, and enhanced student services through Peer-to-Peer mentoring and STEM Counseling; and Go! – Improving articulation with four-year universities, developing a new engineering degree, and student research opportunities in STEM.

Sample key outcomes include: a) increase the number of students declaring STEM; b) transition students from developmental to college-level math and science; c) increase students completing transfer-level math and science courses; d) increase the number of students completing associates degrees in STEM and transferring in STEM fields; and e) increasing the number of articulation agreements to create a seamless transition to the four-year universities.

**P031C110037**  
**Contra Costa College, CA**  
**Individual Development Grant**

**ABSTRACT**

Contra Costa College (CCC) proposes CCC Link, which is a comprehensive approach to substantially reducing the achievement gap in college completion and transfer rates among Hispanic and low-income students in science, technology, engineering, and mathematics (STEM) fields in the CCC service area. The proposed approach answers absolute priorities #1 (increase the number of Hispanic and low-income students attaining STEM degrees), #2 (develop model transfer and articulation agreements) and the competitive priority of implementing effective more data-based decision making.

The CCC Link comprehensive approach consists of:

- 1) A STEM Engagement Pipeline that will promote STEM education and career options to Hispanic and low-income secondary students from the CCC service area;
- 2) Assessment, Engagement and Support (AES) activities that will provide comprehensive support to target group students who are college ready, and, also to those who are testing one level below college ready;
- 3) A Transfer Pathway that will envelop college ready Hispanic-serving institutions STEM scholars in a comprehensive student support program including mentoring, supplemental instruction, and increased breadth of academic experience prior to transferring;
- 4) Augmentation of articulation agreements between CCC and Hispanic-serving four-year universities with particular focus on STEM transfer students; and
- 5) Data Utilization and Evaluation on student performance to inform course assignments, supportive services (e.g., tutoring, mentoring, supplemental instruction), and midcourse program improvements.

The CCC Link pipeline will: 1) substantially improve our collective ability to attract and retain Hispanic and low-income students in the local community in rigorous STEM academic programs; and 2) prepare them well for transfer leading to bachelor degrees in STEM fields.

**P031C110175**  
**Crafton Hills College, CA**  
**Individual Development Grant**

**ABSTRACT**

Crafton Hills College proposes to more fully support the success of Hispanic and other low-income students through the creation of clear pathways through which Hispanic students attain degrees in the fields of science, technology, engineering, and mathematics (STEM). This project will strengthen articulation by developing model STEM articulation agreements between Crafton Hills College, a two-year Hispanic-serving institution (HSI), and four-year institutions. A STEM Transfer Services Coordinator will be hired through this project and become permanent at Crafton Hills College by the end of the project, connecting students with existing articulated courses and assisting the Crafton Hills College Articulation Officer in developing additional agreements. A STEM Research Analyst will be integral to the project to enable data-based decision making. Finally, updated courses, programs, equipment and professional development will transform Crafton Hills College from lagging to leading STEM efforts among two-year HSIs in the Inland Empire.

Crafton Hills College is in a unique position to increase the number of Hispanic students attaining STEM degrees. A local bond approved by voters and supported by the college's administration, faculty and staff has begun to address the gap between the 29 percent of Crafton Hills College students identifying themselves as Hispanic and the 47 percent of pre-collegiate Hispanic students in San Bernardino County. A newly-restructured Office of Research and Planning has made great strides in providing data necessary to guide the college in decision-making; however, there is still a great need to attract and prepare STEM students, especially among Hispanic students. Reaching into secondary and elementary schools in the Crafton Hills College service area to increase STEM awareness and preparation will help address the need. This project will also attract and retain more college students by modernizing Crafton Hills College course offerings, programs, equipment, and teaching strategies in STEM. Up-to-date technology, opportunities for student research and solid articulation with four-year institutions will prepare Crafton Hills College students for the next step - transfer to a STEM major at a four-year institution.

Project goals are to significantly increase the number of Hispanic students receiving degrees in STEM and transferring to four-year colleges and universities; increasing the capacity of Crafton Hills College STEM faculty to remain current in their respective fields; and increasing data-based decision-making in STEM fields of study. Policy and practices at Crafton Hills College continue to be influenced by data; this project has its origin in research and represents the most effective strategies to address the need to increase the number of Hispanic students.

**P031C110166**

**El Camino Community College District, CA  
Individual Development Grant**

**ABSTRACT**

El Camino Community College is a large, public two-year community college in the urban South Bay region of Los Angeles County. In fall 2010, it served 24,775 students, 9,291 (38 percent) of whom self-declared Hispanic ethnicity, and employed 330 full-time and 512 part-time faculty.

Deficits to be Addressed: Analysis of factors at El Camino College contributing to the gap in transfer of Hispanic students in science, technology, engineering and mathematics (STEM) fields include: a) Students arrive at El Camino College without the needed academic preparation and academic habits for success in STEM programs; b) Informational and advising services for STEM career planning, STEM transfer support, internships and work experience is fragmented; c) Gaps exist in transfer articulation of emerging curriculum; d) Academic and learning support for students in STEM disciplines needs strengthening and continued development; e) There have been too few scholarships and program support dollars targeting students preparing for careers in science, technology, engineering and math fields.

Responses in Application: El Camino proposes researched best practice strategies to achieve the following goal areas, which respond directly to the needs of the funding program's target population (Hispanic and low-income students) and measure success in implementing strategies to overcome gaps and deficiencies.

1. Increase the numbers of STEM degrees awarded (with an emphasis on STEM degrees awarded to Hispanic students); and increase transfer of all students in STEM, with an emphasis on increasing transfers of Hispanic students in STEM disciplines.
2. Develop and articulate agreements for transfer of technical programs to four-year institutions and address any other course or program articulation gaps for STEM transfer.
3. With a focus on students' academic success, centralize, expand and strengthen academic and student support services for STEM students into a new STEM Center. Also, strengthen ties to STEM industries and agencies, for mentors and speakers, internship placements and scholarships.
4. Continue a strong faculty development program to support professional skills updating of science, math, and technology faculty and counselors.
5. Increase effectiveness and depth of outreach activities to community and Hispanic feeder high schools to raise awareness of STEM careers and improve academic readiness of students entering STEM courses and programs at El Camino.

**P031C110006**  
**Glendale Community College, CA**  
**Individual Development Grant**

**ABSTRACT**

Glendale Community College, a large public community college serving the greater Los Angeles area, will build on a solid foundation of research and evidence to implement a fully-integrated, coordinated basic skills program with the characteristics now recognized to have the most potential to improve access to science, technology, engineering, and mathematic (STEM) for Hispanic and other low-income students. The proposed project is titled, *“Opening the Gateway to STEM Degrees for Hispanic and Other Underprepared Students.”*

Glendale Community College’s basic skills program is the most significant institutional barrier to degree completion for Hispanic students, all of whom are potential STEM transfer students. Glendale Community College Hispanic students placed in basic skills courses now are much less likely to succeed than other Glendale Community College students. The improved basic skills program to be developed through this project is tailored to meet the needs of Hispanic students who are still not succeeding equitably at Glendale Community College and who critically need to complete college degrees in STEM. The service area has enormous need for a workforce with degrees in STEM and provides many career opportunities in these areas for Hispanic students who complete degrees. Glendale Community College has many gaps in addressing this need.

The project goals and the college’s current mission and goals are fully consistent with HSI STEM & Articulation program priorities.

**Priority 1:** Increase the number of Hispanic and low-income students attaining STEM degrees. The first central project goal is to improve the academic success and degree completion of Glendale Community College’s Hispanic students, focusing on the first major barrier to their degree completion – the college basic skills program. **Priority 2:** Enabling more data-based decision making in projects designed to improve postsecondary student outcomes. The second central project goal is to develop a basic skills program research capability and evaluation system to support continuous improvement of the new program in meeting Glendale Community College mission and goals. **Priority 3:** Develop a model transfer and articulation agreement in STEM fields. The third central goal is to develop a model articulation agreement with local transfer universities to strengthen outreach and improve student readiness for college STEM degree completion through intersegment collaboration.

**P031C110096**  
**Los Angeles Harbor College, CA**  
**Individual Development Grant**

**ABSTRACT**

Los Angeles Harbor College (LAHC) is a Hispanic-serving, comprehensive, two-year public community college offering a broad spectrum of transfer, career-technical, and community services programs. The over 10,000 students (47.3 percent Hispanic, 39.8 percent low income) who enroll each semester in credit courses reflect the diverse ethnic composition of the communities served by the college. In fact, 80 percent of the households in the college's primary service area are minority. By 2017, 82 percent will be minority and 60 percent will be Hispanic.

Significant opportunities for individuals with college educations exist in our service area. Regional job growth in science, technology, engineering, and mathematics (STEM) fields is projected to be high over the next decade. However, incoming students assess very low in Math, often four to five levels below the first transfer-level course (57 percent of all students, 63 percent of Latino), and many cannot pass the classes into which they are placed. In fact, less than four percent of those who start at the lowest levels of math ever enroll in a transfer-level course. Consequently, students are failing to enroll in and complete the transferable math classes required for any STEM major. Predictably, then, STEM courses and programs at Los Angeles Harbor College have low enrollments (less than four percent of students major in science, technology, engineering, mathematics fields), low success rates (43-56 percent), and very few graduates (less than two percent of graduates).

To become the conduit to degrees in high-demand STEM fields for majority Hispanic service area residents who need and want to begin at the community college level, however, we must reduce the gaps that exist in services and infrastructure and increase our ability to address existing opportunities to increase student participation and success in STEM fields. These gaps include the following: ineffective Math Assessment and Basic Skills/ Foundation Math curricula; inadequate support for STEM enrollments and majors; insufficient equipment, technology, and training to support success; generic transfer articulations; and limited access to high-quality, timely data to guide decision making.

The proposed Harbor College *STEM Passport Academy* will become the vehicle for transforming STEM education at Los Angeles Harbor College, attracting students to STEM majors, increasing their ability and motivation to succeed in and complete STEM degrees, and ensuring their preparedness for transfer to four-year STEM degrees.

**P031C110097**  
**Los Angeles Mission College, CA**  
**Individual Development Grant**

**ABSTRACT**

Los Angeles Mission College (Mission) is a public, two-year community college located in the Northeast San Fernando Valley of Los Angeles, California and serves 10,275 students of whom 71 percent are Hispanic. Mission has high numbers of academically under-prepared Hispanic students, the lowest transfer rate of all the Los Angeles Community Colleges and one of the lowest in the state. Over the past decade, the College has served an increasing influx of students with diverse needs that severely test its ability to reach and maintain the levels of student retention, progression and program completion that it strives to achieve, especially in the area of science, technology, engineering, and mathematics (STEM). Historically, the majority of Mission students have been low-income and under-prepared for college-level coursework.

The Project—*Improving STEM Success and Access for Hispanic Students at Los Angeles Mission College*—at Mission will establish a comprehensive STEM Center combining academic and student support services. The Center will serve as the hub for faculty and students, strengthening academic services by: 1) expanding tutoring, math workshops and summer bridge programs for STEM students; 2) supporting curriculum development in math, life science, physical science and computer science; 3) renovating the computer science lab and upgrading technology, 4) offering STEM Summer Academy to incoming STEM majors, and 5) expanding and formalizing undergraduate research program. The STEM Center will also build capacity in student support services for potential and current STEM students. These services will include: 1) incorporating STEM specific outreach strategies in the feeder schools and community; and 2) developing STEM transfer awareness and articulation through the hiring of a STEM Transfer and Articulation Specialist.

Key measures of success include: a) increased number of STEM degrees awarded; b) increased number of technology infused courses across STEM disciplines; c) increased STEM articulation agreements; d) increased retention and transfer rates; and e) increased Hispanic graduation, degree attainment, and transfer rates.

**This proposal addresses both competitive priorities:** 1) Presents high quality strategies to increase the number of Hispanic and low-income students attaining degrees in fields 2) Implements development of transfer and articulation agreements in STEM fields between a two-year Hispanic-Serving Institution (L.A Mission College) and four-year universities within the University of California and California State University systems.

**P031C110014**  
**Los Angeles Valley College, CA**  
**Individual Development Grant**

**ABSTRACT**

Los Angeles Valley College (LAVC), an open-door Hispanic Serving Institution and comprehensive, public, two-year community college, serves 19,888 students, of whom 8,642 are Latino (41 percent of enrollment, Fall 2010) from some of the poorest communities in Los Angeles County's San Fernando Valley. Residents across Los Angeles Valley College's struggling service area look to the College for access to programs of study leading to improved socioeconomic stability. Increasingly, these opportunities are in science, technology, engineering, and mathematics (STEM) fields, where career options – particularly for Latino professionals – are growing rapidly. In Los Angeles, baccalaureate degree holders in STEM fields can expect job growth of 47 percent in technology-related fields, 18 percent in life sciences, and 28 percent in engineering fields.

However, Valley's low STEM degree completion (5 percent) and transfer rates (1.4 percent of completers), particularly among Latino students (18 science, technology, engineering, and mathematics graduates, zero transfers), indicate that few students will ever realize the promise of these lucrative, stable careers. At the root of Los Angeles Valley College's low STEM transfer is our students' academic under-preparation for mathematics courses that are foundational to STEM baccalaureate degree completion. For these students math can become a nearly insurmountable obstacle, rather than a gateway, to baccalaureate degree programs leading to promising STEM professions.

However, institutional gaps and weaknesses prevent us from meeting the extensive needs of the 5,000+ students who take math courses at Los Angeles Valley College each semester, not to mention those who simply choose not to enroll in math and math-intensive STEM courses: traditional instructional methods and formats for mathematics; extremely limited support for mathematics students; overcrowded, minimally equipped facilities; very limited funding for professional development.

Los Angeles Valley College's proposed project, Accelerated Pathways to STEM, is designed to: (1) decrease student time in the mathematics pipeline; (2) increase student interest, success, and confidence in STEM related fields, particularly for Latino and/or low-income students; (3) develop model articulation agreements with our primary transfer institutions, and (4) use high-quality, timely data to improve participant outcomes, in order to increase enrollments and completions in STEM degrees and transfer to four-year institutions.



**P031C110138**  
**Los Medanos College, CA**  
**Individual Development Grant**

**ABSTRACT**

At Los Medanos College, we have a large gap between our students who hope to transfer (560 students) in science, technology, engineering, and mathematics (STEM) and those who actually do (45 college-wide, 9 Hispanic). *The STEM Transfer Velocidad* is a comprehensive initiative which will bridge this gap, creating systemic change at LMC in which STEM transfer is a high institutional priority. Principles from California's Transfer Velocity Project weave through the four components to create a 2+2+2 sustainable pipeline. These principles are strong linkages with community and families; high quality programs and instruction based on proven models of excellence; high levels of student, faculty and staff engagement and support; and high levels of professional development based on effective assessment.

Component One: *College Readiness for High School STEM Students* – Establishing the Pipeline, focuses on establishing strong connections with Hispanic STEM focused students, their families and their preparation in high schools.

Component Two: *Transfer Readiness* – Accelerating the Pipeline, will provide Hispanic and other low-income students with programs that support and accelerate their STEM transfer.

Component Three: *Articulation Readiness* – Solidifying the Pipeline, will articulate and monitor major pathways for STEM transfers with feeder four-year universities.

Component Four: *Institutional Readiness* – Assessing & Improving the Pipeline, will create and sustain a STEM focused assessment and transfer culture which makes informed, data-driven and equity-focused decisions with its heart in learning and improved outcomes for students.

**P031C110107**  
**Modesto Junior College, CA**  
**Individual Development Grant**

**ABSTRACT**

Modesto Junior College seeks to increase the number of Hispanic and other low-income students who excel in college mathematics and science programs and articulate to four-year universities in a science, technology, engineering, and mathematics (STEM) field through the establishment of the *STEM Learning Connections* project which establishes a science and mathematics learning hub, provides innovative learning resources and support, and creates an articulation model that includes counselor and faculty advising. Project goals address both program absolute priorities and the competitive priority.

This project will provide critically-needed additional support services to Hispanic students preparing for STEM majors through integration of four strategies:

- 1) STEM Support Services: *Establish a 21st Century STEM Learning Center.* A technology-enabled learning environment will support enhanced tutoring, group instruction, STEM workshops, and a summer “math jam”.
- 2) STEM Advisory and Articulation: *Implement a course to course and faculty/counselor advisory and articulation model.* Faculty and Counselors will be trained in effective STEM advising and increase the number of STEM articulations with four-year universities.
- 3) STEM Instructional Delivery Improvement: *Enhance curriculum and instructional delivery* to align math and science courses with 4-year universities and integrate technology-enabled learning into STEM courses.
- 4) STEM Program Evaluation Model: *Build a data-based decision-making model to gather, analyze, evaluate, and improve STEM programs.* STEM programs will be evaluated by developing tools and processes for faculty and administrators to evaluate outcomes and innovative instructional methods.

**P031C110177**  
**Mt. San Jacinto Community College District, CA**  
**Individual Development Grant**

**ABSTRACT**

Mount San Jacinto College is a public, Hispanic-serving, two-year degree granting community college in Riverside County, California with a fall 2010 unduplicated headcount enrollment of 17,583 and a Hispanic student population of 5,187 (29.5 percent). Mount San Jacinto College has four sites that are located in the communities of San Jacinto, Menifee, Banning, and Temecula. Mount San Jacinto College Hispanic students are less likely than non-Hispanic students to actively participate in science, technology, engineering and mathematics (STEM) degree programs (25 percent), less likely to complete a STEM transfer-level course (66 percent), have lower grade point averages (2.58) in STEM courses, and are more likely to withdraw from STEM classes. Only 90 Hispanic students out of 389 students transferred to a four-year institution in fall 2009, and out of the 371 associate degrees awarded to Hispanics, only twelve (12) students received a STEM degree.

The activities of the proposed project are organized into two major components: (1) ***STEM Instructional Support*** and (2) ***STEM Student Success***. Mount San Jacinto College is adopting a holistic approach to optimize: 1) the percentage of Hispanic students receiving STEM degrees and/or transferring from two-year to four-year institutions, 2) increasing student success and retention rates in transfer-level STEM courses, 3) improving the completion of student education plans, and 4) institutionalizing the use of student learning outcomes to make programmatic improvements. Each component focuses on a comprehensive effort to affect the goal of increasing student success by improving retention and completion of educational goals – in particular the success of Hispanic and underprepared students.

*STEM Instructional Support*: will include STEM professional development and educational training for Mount San Jacinto College faculty and local K-12 teachers and implementation of a STEM Teaching and Learning Academy. *STEM Student Success*: will strengthen learning assistance through advising/counseling case management, completion and standardization of student education plans, development of a STEM early alert STEM for at-risk students, and outreach for Hispanic and underprepared students as well as student success workshops, seminars, STEM Institutes- Summer Bridge program, Math Jams, and STEM major/career fair. Appropriately trained staff will ensure that students receive professional guidance in the identification of educational goals, appropriate course placement, and referrals to supplemental assistance with academic or personal challenges.

**P031C110120**  
**Napa Valley College, CA**  
**Individual Development Grant**

**ABSTRACT**

Napa Valley College is a comprehensive, public community college that serves the residents of semi-rural Napa County, California. Located 50 miles northeast of San Francisco, Napa Valley College is situated just south of downtown Napa, the largest city in the county. In fall 2009, Napa Valley College enrolled a total of 7,414 credit students.

The demand for science, technology, engineering, and mathematics (STEM) workers in California, especially in the neighboring San Francisco Bay Area, is among the highest in the nation. Napa Valley College needs to overhaul its STEM programs to provide high quality education necessary to meet these needs. Napa Valley College's lab facilities are nearly 50 years old, and the equipment and technology is not up-to-date. As a result, students are not receiving an educational experience comparable to that found in lower division courses at four-year institutions.

To address the identified educational needs of Hispanic and other low income students Napa Valley College proposes a project that will: 1) increase by 100 percent the number of STEM degrees awarded to Hispanic students, 2) increase by 100 percent the number of Hispanic students transferring to four year institutions declaring a STEM major, and 3) collect, analyze and use high-quality and timely data to improve student outcomes relating to enrollment, persistence, and completion leading to career success.

Napa Valley College has developed an ambitious plan to meet the full range of student needs, from those with weak math skills to those who are advanced science majors. Project activities are structured around four strategies that promote student success: 1) faculty development opportunities, 2) development and improvement of academic programs, 3) acquisition of equipment for strengthening academic programs, and 4) development of STEM specific student services. The project includes activities such as learning communities, supplemental instruction, bilingual STEM counseling and community outreach. Napa Valley College has already demonstrated success with similar approaches in its Math Engineering Science Achievement and Puente programs.

**P031C110065**  
**Notre Dame De Namur, CA**  
**Individual Development Grant**

**ABSTRACT**

To accomplish the overall programmatic goals of the Department of Education's HSI STEM & Articulation Programs, Notre Dame de Namur University (NDNU) proposes the ***Building a Pipeline to STEM Success at Notre Dame de Namur*** project, one that promises to result in significant increases in educational outcomes for Hispanic and other low-income students and to create an important model for science, technology, engineering, and mathematics (STEM) focused articulation programs between two-year Hispanic-serving institutions and four-year institutions.

The *Building a Pipeline* project will also fulfill the stated competitive preference priority: to "collect, analyze, and use high-quality and timely data in . . . improving postsecondary student outcomes relating to enrollment, persistence, and completion and leading to career success." *Building a Pipeline* project goals and activities include the following:

**Goal 1:** Increase the number of Hispanic and other low-income students attaining degrees in the STEM fields at NDNU leading to career success.

**Activities:** Increase enrollment, retention, and degree completion rates of Hispanic and other low-income students in STEM by providing: (1) academic support for students (including STEM tutorials, supplemental instruction in STEM gateway courses, library instruction/information literacy, and library materials), (2) professional development for instructors STEM pedagogies, differentiated instruction, and cultural differences), (3) building identity and career paths (faculty-student mentoring , a STEM professionals speaker series, library internships, hands-on research at NDNU, and guidance on applying summer research internships), and financial support (endowed scholarships for Hispanic and low-income students majoring in STEM fields).

**Goal 2:** Create model transfer and articulation agreements between NDNU and two-year HSIs.

**Activities:** Use existing NDNU models of transfer and articulation agreements, based on best practices and processes, to create and sustain new model transfer and articulation agreements with local two-year HSIs.

**Goal 3:** Collect, analyze, and use high-quality and timely data in improving Hispanic and other low-income NDNU students' educational outcomes related to enrollment, persistence, and completion leading to career success.

**Activities:** Data collection and analysis for purposes of project evaluation and institutional improvement in services to Hispanic and low-income students in STEM.

**P031110146**

**Palomar Community College District, CA  
Individual Development Grant**

**ABSTRACT**

Palomar Community College is public postsecondary institution located in North San Diego County. Palomar serves over 28,000 students each semester, of which 47 percent are ethnic and racial minorities and 34 percent are Latino. The number of underrepresented students who declare a science, technology, engineering, and mathematics (STEM) degree is small and for those that do, the probability of successfully earning a STEM bachelor's degree is nonexistent. In the past, the college has focused activities to support STEM student success by addressing the needs of students in transfer-level STEM courses. Most (84 percent) entering HLI STEM students begin Palomar underprepared, especially in math and only seven percent make it through the math sequence. In order for Palomar (or any other postsecondary institution) to increase the number of Latinos earning a STEM bachelor's degree, the lack of student success in pre-collegiate mathematics, reading, and writing must be addressed.

Palomar identified the following project goals: (1) Increase the number of HLI students who participate in and successfully navigate the STEM pathway from start to transfer; (2) Increase HLI STEM student success and completion rates in pre-collegiate mathematics and other basic skills courses. (3) Improve HLI STEM student success in transfer-level courses (4) Improve HLI STEM student retention, persistence and success by expanding professional development opportunities for all faculty/staff to enhance the quality of academic and student services. The college identified four interwoven strategies to achieve its goals.

- Strategy #1: Align Outreach, Guidance, Support and Transfer Services (Goal #1). Coordinate processes for conducting STEM outreach and follow-up that provides students a structured pathway and ongoing follow-up. Develop an HLI STEM Student Mentor Program, implement an automated academic advising, and create and expand Transfer Admission Guarantee programs with CSUSM and UCSD.
- Strategy #2: Pre-Collegiate and Transfer STEM Curriculum Redesign (Goals #2 & #3). Create a developmental mathematics immersion program that focuses on student success, and decreases time to completion of math sequences. Implement STEM learning communities; modularize pre-algebra curriculum; and build applied math, reading, and writing modules for science courses.
- Strategy #3: Improve Technology and Infrastructure (Goals #2 and #3). Update the Math Learning Center; imbed computerized adaptive tutoring in math classes, update labs and equipment, especially those related to the proposed biotechnology TAG agreement.
- Strategy #4: Pedagogy and Professional Development (Goal #4). Implement interdisciplinary professional development programs, including a STEM academy for collaborative teaching. Resources were applied to increasing the college's capacity for making evidence-based decisions and objectives and outcomes defined with identified baselines. The outcomes focus on HLI students and include the percentage of students entering the STEM pathway, the percentage of students successfully completing pre-collegiate courses and transfer-level STEM courses, and the percentage of students transferring to a four-year university.

**P031C110136**  
**Reedley College, CA**  
**Individual Development Grant**

**ASBTRACT**

Reedley College, an associate degree-granting institution of State Center Community College District (SCCCD), is located in the small, rural community of Reedley in Fresno County, California, 30 miles southeast of the city of Fresno. *Fall 2010 enrollment was 6,991 of which Latinos comprised a significant 60 percent (4,208).* Reedley College is fully accredited by the Western Association of Schools and Colleges (WASC) and governed by the State Center Community District. Reedley College offers 35 associate degrees, 65 vocational certificates and prepares students for transfer. Reedley College programs and courses are organized into three divisions.

The program goal is to increase Hispanic student enrollment in science, technology, engineering, and mathematics (STEM) courses; and ultimately for them to transfer to universities and graduate in a science, technology, engineering and math related field. Goal 1: Increase the number of Reedley College students who are awarded degrees in STEM fields. Goal 2: Increase STEM degrees being earned by Hispanic students. Goal 3: Increase the number of Reedley College students and Reedley College Hispanic transferring in STEM fields. Goal 4: Develop new transfer programs in emerging STEM fields and articulate curriculum with four-year colleges and universities. To accomplish this, Reedley College HSI STEM grant proposal focuses on:

- 1) **New STEM Program Development and Articulation for Transfer:** Articulation processes will involve review of course outlines, programs of study, comparable courses and programs throughout the state. This review will be followed by investigation of Career Pathways templates and transfer career pathways design.
- 2) **Strengthening of Existing STEM Programs and Labs & Improving Articulation:** Reedley College science labs currently do not adequately prepare students for the next level of science courses. Reedley College proposes to improve labs in: *Agriculture, Biology and Chemistry.*
- 3) **Academic and Student Services Support for science, technology, engineering and math:** Strengthening of the Math Study Center and implementing best practices for learning support, the Transfer Center's *Alianza de Transferencia* (Transfer Alliance Program) program is supported by a bilingual Transfer Counselor, Faculty & staff training on inclusiveness and diversity, as well as best practices and new approaches for increased student engagement in laboratory and science learning.
- 4) **STEM Outreach to Hispanic Communities and Feeder Schools:** To attract students into sciences and engineering, we will create a *bilingual* "Parents as Partners" program (*Padres Como Companeros*) under a Title V grant, into which we will now integrate information on STEM careers and college readiness, hire an internship coordinator and conduct other.
- 5) **Enabling More Data-based Decision-Making *Competitive priority:*** Automating the extraction and formatting of data queries and reports via *Student Analytics* from iStrategy Solutions.

**P031C110035**

**Riverside Community College District – Moreno Valley College, CA  
Individual Development Grant**

**ABSTRACT**

Moreno Valley College (MVC) of Riverside Community College District, located in the city of Moreno Valley in Southern California's Inland Empire region, is a designated Hispanic-serving institution, two-year public comprehensive community college. Populations served by Moreno Valley College are concentrated in Riverside and San Bernardino Counties. The two counties are home to more than four million people, including large proportions of Hispanic and low-income residents. Moreno Valley College's primary service area has more than 45 percent Hispanic residents. Fewer than 17 percent of residents have bachelor's degrees and 12 percent live below poverty.

Faced with science, technology, engineering, and mathematic (STEM) enrollment and persistence trends that indicate Hispanic and other low income students are not receiving the academic and support services needed for success, MVC proposes Project TAP (Technology Access Program) to expand STEM curriculum and learning support services that address the growing needs of students. To improve completion and transfer rates in STEM fields of study, it is imperative that the institution increase and improve academic and support services to provide high quality and effective programs for Hispanic and other low-income students. MVC is seeking funding to implement the latest advances in technology to support a virtualized environment. In carrying out this activity, orchestrating today's STEM technologies through virtual motion, MVC has the opportunity to deliver virtual educational technologies, driving innovation and creativity in support of increasing STEM completion, persistence, graduation and transfer rates. This is a single, multidisciplinary activity that represents an aggressive approach to institutional change, specifically addressing improvements in STEM academics and services through virtual educational technologies.

Building on research and literature including best practices, MVC will refine, expand, enhance, and integrate a series of academic and support service technology projects. The project expands and enhances MVC's STEM Student SUCCESS Center integrating a state-of-the-art Technology Center and a mobile Innovation Learning Center. Both designed to provide students the opportunity to explore and engage in STEM resources, courses and programs: virtual labs; mobile applications; academic support services; experience project-based learning, hands-on and interactive activities; multimedia experiences. The mobile Innovation Learning Center brings technologies and labs to the community MVC serves. Counselors and staff will provide students with comprehensive support services including case management counseling and career and transfer pathways.



**P031C110002**

**Riverside Community College – Norco Campus, CA  
Individual Development Grant**

**ABSTRACT**

Norco College (Riverside Community College/Norco Campus, founded 1991) is an open-door, two-year, Hispanic-Serving Institution located in Riverside County, California. Riverside County (population 2.1 million) has exploded by over 37 percent since 2000 with Hispanic population growth accounting for 67 percent (400,000 individuals). The county is part of the greater “Inland Empire” of Southern California, noted for advanced technology-based enterprises and rapidly expanding opportunities in alternative energy, engineering technology, and sustainable engineering, estimated to create over 6,000 jobs over the next five years.

Participation in emerging science, technology, engineering, and mathematics (STEM) fields is dependent on educational attainment. However, Hispanic educational achievement is not keeping pace with this demand: only eight percent of Hispanic adults in the service area hold a bachelor’s degree, compared to 21 percent of adults overall. Consequently, Hispanic per capita income is only two-thirds of the overall service area figure of \$22,827. While more Hispanic students in the area are enrolling in college, data from area high schools demonstrate that many underperform in mathematics, and, when they do enter college, they enter underprepared to succeed in core courses required for STEM degrees.

Norco College has a mandated responsibility under California State Law to prepare its students for transfer to the region’s three public universities, but gaps in pre-engineering curricula, facilities, and equipment are preventing us from fulfilling this responsibility at the highest level.

Norco’s proposed project, *Un Sendero Luminoso*, responds to these deficiencies in three ways. (1) Working collaboratively with faculty from the region’s three public universities, we will redesign curricula to create a rigorous, culturally responsive pre-engineering associate degree for direct transfer, along with four pre-engineering degree options in alternative energy, engineering technology, and sustainable engineering. (2) Student success for Hispanic and disadvantaged learners will be developed through adoption of the MESA (Mathematics, Engineering and Science Achievement) program; 100 percent of California Community College student participants on other campuses which have adopted this program successfully transferred to a four-year institution, 60 percent of these in a STEM major. We will address college preparedness through expanded outreach that supports students in completion of college algebra and trigonometry during high school. (4) We will develop a centralized STEM Learning Center that includes dedicated open labs, tutoring, technology/software, career advising and counseling, and transfer activities.

**P031C110132**

**Sab Joaquin Delta Community College, CA  
Individual Development Grant**

**ABSTRACT**

San Joaquin Delta Community College District seeks \$3.8 million in funds to establish the Delta science, technology, engineering, and mathematics (STEM) Academy. The College is situated in the city of Stockton in the Central Valley of California. The community features high poverty and unemployment levels (currently 18.7 percent) and has been one of the cities hardest hit by the banking and mortgage foreclosure crisis (currently third in the nation in homes facing foreclosure). Low income families and Hispanics make up disproportionately large shares of the residents facing economic and housing troubles, and roughly 60 percent of the College's students qualify for complete tuition fee waivers because of their economic circumstances. The College has had some success in providing avenues for low income students to move toward high-paying STEM careers, but state budget cuts have hampered the College's ability to provide a broad set of services to students and technology in many learning spaces is well below the standards found at four year universities.

The Delta College STEM Academy seeks to increase the number of Hispanic and low income students who complete STEM degrees or transfer programs. The Academy is designed to address four key elements that foster student success: 1) the use of peer learning communities made up of diverse groups; 2) support services like tutoring, mentoring experiences and supplemental instruction that ensure students succeed and sustain their interest in STEM careers; 3) intensive case management designed to keep students focused on their educational goals and guide students in a deliberate manner toward milestone achievement; and 4) modern learning environments that use up-to-date lab equipment and technology to enhance learning. The grant funds will help improve learning spaces and provide key support services to students as they make their way through STEM certificate and degree programs, with a goal of boosting successful STEM course completions by five percent and transfers by 40 percent over a five-year period.

**P031C110153**  
**Santa Barbara City College, CA**  
**Individual Development Grant**

### **ABSTRACT**

**ACTIVITY: Science, Technology, Engineering, and Mathematics (STEM) Science Transfer Program (STP) (\$4,096,117 over five years)**

Strategies will increase the number of Hispanic and low income students that enter STEM majors, complete STEM associate degrees and transfer requirements, and successfully transition to a four-year university in a STEM discipline in two to three years. The STP provides clearly defined and highly structured pathways from basic skills to associate degree, to transfer in STEM disciplines. Project outcomes for Hispanic and low income students include a 25 percent increase in enrollment in STEM majors, a 100 percent increase in STEM degree completion rates, and 36percent increase in transfer rates.

**Component One: Progression from Basic Skills to College-level Courses to Degree Completion and Transfer in STEM majors** through activities to support Accelerated Learning Communities contextualized for STEM students in need of basic skill remediation to include highly structured general education and major STEM courses to complete STEM degree and transfer objectives in two years, and strategies to increase the number of articulation agreements in STEM majors at four-year universities

**Component Two: Develop Strategies to Strengthen Academic and Support Services** to better serve underrepresented STEM students to include a new *STEM Pathways Tracking System*, development of STEM Curriculum Pathways, integration of academic and student support services into STEM Learning Communities, intensive orientation/ counseling, and in depth Faculty and Staff Development. Access to financial and technology literacy skills for underrepresented students, is woven throughout.

**Component Three: Increasing Resource Development Capacity to Better Serve Underrepresented Students** To reduce the federal cost for undergraduate degree attainment in STEM degree and articulated programs by strengthening the fiscal stability of the College and building the capacity to provide enhanced services and programs.

**P031C110078**  
**Taft College, CA**  
**Individual Development Grant**

**ABSTRACT**

Taft College (Taft) serves one of the highest need and educationally underserved areas in America. Bachelor's degree attainment in the service area is the lowest in the country (13.5 percent compared to California (26.6 percent) and the United States. (24.4 percent)). The region served by Taft is steeped in industries that have expanding needs for qualified, local science, technology, engineering, and mathematic (STEM) graduates, but less than one percent of the residents have earned STEM degrees. Currently there exists a cycle where industries cannot grow without an educated local workforce and growth is needed for economic recovery. Engineers are critically needed. Until recently, this area did not have any accessible engineering degree opportunities for the large population living in the area. Because of exploding local and regional need for engineers, California State University-Bakersfield (CSUB) recently began its first engineering program in Computer Engineering. Taft students need access to this degree opportunity, but the college does not have a pre-engineering program. The purpose of the proposed project, *Opening the Pipeline to Computer Engineering Degrees for Underserved Students in the Southern San Joaquin Valley*, is to build a much needed, scaffold pipeline from local high schools through Taft to engineering degree completion at CSUB.

Goal 1 Objectives: (a) To enroll 50 Hispanic and low-income high school students in Taft's Early Start dual credit program; and (b) To identify 30 first-time, degree-seeking students each year who show intent in engineering by obtaining an individualized degree pathway roadmap and enroll accordingly; (c) To reduce the average time students spend in remediation by two semesters through improved early preparation and accelerated/ modularized remedial math format.

Goal 2: To develop a pre-engineering program that is equivalent to the first two years of an accredited computer engineering program.

Goal 2 Objectives: (a) First year milestone: five percent of Pre-engineering students will successfully complete at least 20 hours in the first year after enrollment; (b) Second year milestone: 45 percent of Pre-engineering students will successfully complete at least 30 transferrable credit hours in their first two years after enrollment.

Goal 3: To develop a fully seamless engineering degree pathway for Taft students through collaboration with CSUB.

Goal 3 Objectives: (a) Transfer milestone: To achieve at 35 percent transfer rate of Pre-engineering students, with students seamlessly transferring all earned credits towards degree completion; and (b) To 100 percent complete a model articulation and transfer agreement in computer engineering with CSUB which support seamless transfer and timely degree completion of Taft students.

**P031C110131**  
**University of California – Riverside, CA**  
**Individual Development Grant**

**ABSTRACT**

The University of California, Riverside, is one of America's most diverse research-intensive Hispanic-serving institutions, and over the past two years we have made significant strides in placing more community college students on the path toward bachelor's degrees and advanced degrees in science, technology, engineering, and mathematics. This project will institute refinements to the initiatives from our previous efforts to enhance the effectiveness of our initiatives and continue to expand the pipeline despite severe budget pressures on public institutions of higher education in California.

The plan has two major activity areas: pre-matriculation and transfer support and student success. Pre-matriculation and transfer support initiatives will engage in course articulation, advising outreach, and design projects that expose community college students to hands-on research opportunities, which inspire them to pursue higher studies. Transition activities also will include summer bridge programs, transition counseling, mentoring, and participation in science, technology, engineering, and mathematics (STEM) clubs. Student success activities will include academic support, STEM clubs, mentoring, and, significantly, paid research opportunities. These paid opportunities, which are provided to students who are transferring or have transferred to a four-year institution, provide needed funds to the students, build confidence, establish relationships with faculty and other students, and inspire an excitement about STEM learning.

**P031C110043**  
**Adams State College, CO**  
**Individual Development Grant**

**ABSTRACT**

Adams State College (ASC) is located in the San Luis Valley (SLV; population 47,950), a vast, geographically isolated rural area and the most economically depressed region in Colorado. ASC was founded to improve access to education and opportunity for the residents of the region—where 33 percent of the population lives in poverty and the fewer than 25 percent of the adults over 24 hold a bachelor’s degree. Nearly one half of ASC’s students are from the San Luis Valley, whose population is 41 percent Hispanic. ASC’s high-quality yet affordable education draws many low-income (71 percent) as well as Hispanic (29.2 percent) students. Overall student enrollment at ASC has increased on an average of 7 percent in the past few years, yet the small portion (14.6 percent) that enters as science, technology, engineering, and mathematics (STEM) majors is not keeping pace. Although Hispanic student enrollment in STEM at ASC has increased slightly to 18.4 percent of STEM majors in recent years, the number is small (31), and the six-year graduation rate is exceedingly low—only 26.8 percent for cohorts beginning in 2001-04, resulting in only five Hispanic STEM graduates per year.

ASC project, *Increasing Student Engagement and Success in STEM (ISES STEM)* is focused on a central goal: to increase and support the number of Hispanic and low-income students majoring in STEM and completing STEM degrees. Based on benchmark models and best practices, over the five-year grant period Adams State College aims to increase the STEM degrees it awards annually by 50 percent and to triple STEM degrees awarded to Hispanic students. To achieve this goal and address barriers to student achievement in STEM at ASC — low initial enrollments, low persistence and graduation rates, and the related need for increased student engagement— ASC proposes three corresponding strategies. These capacity building components aimed at promoting student success in STEM are:

- 1) Outreach- fosters interest in STEM careers and postsecondary education through a summer STEM academy, astronomy-based lecture series, and equipment upgrades to key facilities;
- 2) Academic Support- includes a new STEM Tutoring Center in ASC’s math and sciences building;
- 3) Engagement- promotes persistence and degree completion by building student commitment to STEM.

**P031C110010**  
**Colorado State University – Pueblo, CO**  
**Individual Development Grant**

**ABSTRACT**

Colorado State University-Pueblo, (CSU-P) is a public, four-year, Hispanic-serving institution, located in Pueblo, Colorado, with an annual combined enrollment of 5,145 students, 1,288 (25 percent) of whom are Hispanic. Since 2005, Colorado State University-Pueblo has experienced a 53 percent increase in new freshmen, with 79 percent more Hispanic new freshmen and 90 percent more Hispanic freshmen entering science, technology, engineering, and mathematics (STEM) programs.

Colorado State University-Pueblo's mandated service area encompasses Colorado's most economically-depressed areas; 22.8 percent of Pueblo residents (26.7 percent Hispanic) live in poverty, compared to 9.3 percent in Colorado and 14.3 percent nationally. Historically, Hispanic residents worked in agriculture, as farmers, tradesmen and laborers; consequently, Hispanic and low-income students are often in a vulnerable position as families strive to transition from generations in agriculture or manufacturing to new professions. Nearly half of CSU-P's Hispanic students (46 percent) are first generation college students, urgently seeking opportunity, economic stability, and a way out of poverty.

Opportunity abounds in today's STEM fields, as Colorado takes the lead in green job creation. In the Colorado State University-Pueblo service area, jobs in STEM fields are expected to increase from 5.5 percent to 23.8 percent; in Colorado, 32.7 percent of jobs will be in science and engineering fields, up from the current 10.8 percent (Headwater Economics, 2010).

Colorado State University-Pueblo's proposed project, PROPEL (Providing Opportunities to Excel), is designed to address the needs of Hispanic and low income students who are succeeding and graduating at half the rate of other CSU-P students. We will improve our capacity to retain and support students in STEM fields through: (1) PROPEL (Providing Opportunities to Excel) Center academic support services for STEM majors; (2) sustainable systems service learning and undergraduate research in Math, Biology, Chemistry, Physics, and Engineering; (3) the Summer Academic Forgiveness Education (SAFE) course recovery program; (4) faculty development in sustainability, service learning, and instructional technologies; and (5) articulation workshops with Pueblo Community College leading to a model articulation agreement.

Overall anticipated results will be to increase the number of STEM graduates (Absolute Priority #1) and to develop a model articulation agreement with Pueblo Community College (Absolute Priority #2).

**P031C110029**  
**Otero Junior College, CO**  
**Individual Development Grant**

**ABSTRACT**

Otero Junior College's Hispanic-serving Institutions (HSI) Science, Technology, Engineering, and Mathematics (STEM) and Articulation Programs project, "Success in STEM," is designed to assist the college in increasing the number of students seeking degrees in STEM fields. Specific project components will enable Otero Junior College to improve its associate degree programs in math, science and technology while working to develop model transfer agreements with four-year institutions. The specifics of the project were developed with the help of a detailed self-study, outside input and the use of current statistics and research into best practices.

Four project components have been identified to address the needs of our target population, the Hispanic and disadvantaged students in Otero Junior College's service area. These components are:

1. **Services:** Encourage retention through the development of activities such as outreach, remediation, tutoring, development of new STEM courses and a summer bridge program.
2. **Resources:** Increase student opportunities in STEM through the improvement of technology, facilities, equipment and professional development.
3. **Articulation:** Create model transfer and articulation agreements with four-year institutions to encourage students to pursue extended study in STEM fields and develop on-campus support for these transfer students.
4. **Data Collection:** Create a model of data collection, including designing new collection processes, analyzing data and using it to improve STEM programs at Otero Junior College.

Success in STEM will have significant impact, including: an increase in the number of STEM enrolled students at Otero Junior College, an increase in students who are benefiting from outreach activities, an increase in retention among STEM students and an increase in the number of students who are successfully transferring to four-year institutions in STEM. Tools being put into place through this grant that will assist in its success include additional direct-to-student services, the development of new STEM courses, increased professional development opportunities for faculty and improved on-campus technology designed to support higher technology courses.



**P031C110163**  
**Trinidad State Junior College, CO**  
**Individual Development Grant**

**ABSTRACT**

Trinidad State Junior College, the oldest community college in Colorado, is a public, Hispanic-Serving Institution (HSI) serving approximately 1,900 students in rural Colorado. Trinidad State Junior College is proposing a HSI Science, Technology, Engineering, and Mathematic (STEM) & Articulation Program project to increase enrollment, retention and completion rates with an added emphasis on transfer to four-year institutions. **Invertir en STEM! (*Invest in STEM*)** will improve and transform the science, technology and mathematics programs at Trinidad State Junior College. Students in an eight-county region of southern Colorado, including 20 high schools, will be served by *Invertir en STEM!* Trinidad State Junior College will develop formal articulation agreements with at least three four-year institutions in southern Colorado, including but not limited to: Colorado State University - Pueblo, University of Colorado – Colorado Springs and Adams State College.

Project Goal: Increase the number of students pursuing careers in science, technology, engineering and math-related fields.

Objective 1: By Sept. 30, 2016, the number of first-time, degree-seeking undergraduates enrolled in STEM fields at Trinidad State Junior College will increase by 15 percent.

Objective 2: By Sept. 30, 2016, the number of first-time, degree-seeking undergraduates retained from freshman year to sophomore year in STEM fields will increase by 18 percent.

Objective 3: By Sept. 30, 2016, the number of first-time, degree-seeking undergraduates at Trinidad State Junior College who graduate in STEM fields within three years of enrollment will increase by 15 percent .

Objective 4: By Sept. 30, 2016, the Trinidad State Junior College transfer rate for STEM students moving on to a four-year institution will increase by 10 percent.

Objective 5: By Sept. 30, 2016, the federal per student cost for undergraduate degrees in STEM and Articulation Programs at Trinidad State Junior College will decrease by 12 percent.

**Expected Outcomes:** *Invertir en STEM!* will produce clear outcomes, including:

Comprehensive academic support for STEM students; Development and implementation of bridge programming; 1,500 students served through STEM outreach activities; At least four new 100 and 200 level STEM courses in traditional and online formats; Increased enrollment (up 15 percent), retention (up 18 percent); and graduation (up 15 percent); Articulation agreements with at least three regional four-year institutions; and an increase in STEM students transferring to four-year institutions.

**P031C110063**

**Hillsborough Community College – Dale Mabry, FL  
Individual Development Grant**

### **ABSTRACT**

Hillsborough Community College - Dale Mabry is part of the Hillsborough Community College (HCC) District in Tampa, Florida, and a two-year, public, comprehensive, Hispanic-serving institution in the heart of Tampa's Hispanic community. Unlike more affluent coastal neighborhoods, this area is severely disadvantaged: compared to Caucasians, Hispanic families have three times the incidence of poverty and half the per capita incomes and bachelor's completions. Yet Tampa offers tremendous opportunity, notably in science, technology, engineering, and mathematics (STEM), and a greater percentage of Hillsborough County's bachelor-degreed Hispanics hold science, engineering, and related degrees than Caucasians (41 percent vs. 39 percent, Census 2009).

Recognizing this opportunity, Hillsborough Community College -Dale Mabry's student body has grown to more than 14,000 per year, with 56 percent minority, 28 percent Hispanic, and a majority of low-income students. Hillsborough Community College -Dale Mabry is committed to preparing more Hispanic and low-income residents for careers in STEM, but gaps in our programming limit access and result in poor achievement: many would-be enrollees find their classes filled, and among students who do enroll, an average of 36 percent fail key math, life sciences, chemistry, and physics courses; some failure rates are as high as 68 percent. Only 12 percent of transfer-directed students graduate and only 16 percent transfer for bachelor's degrees within three years of enrollment. Gaps include inadequate access through limited distance education and on-campus STEM facilities, ineffective STEM instruction, and insufficient academic planning, advising, and transfer support.

Hillsborough Community College -Dale Mabry therefore proposes the project titled ***Expanding STEM Access and Success***. The project will increase the number of STEM courses offered in distance formats, improve the effectiveness of instruction in key classroom and existing distance courses, and develop effective STEM planning, advising, and transfer support services. A Biology Lab, STEM Success Center, and STEM Transfer Center will be renovated, and current instrumentation will be installed in STEM classrooms and labs. The project also includes creating a model articulation plan with the University of South Florida, our transfer students' primary destination, and University of South Florida supports joint faculty work toward more closely aligned curricula and standards and collaborative faculty development to improve instruction and student progress.

**P031C110011**

**Miami Dade College- North Campus, FL  
Individual Development Grant**

### **ABSTRACT**

Miami Dade College North Campus (MDC) proposes to establish the *STEM Ladder to Student Success* project to increase enrollment of Hispanic and other low-income minorities attaining science, technology, engineering and mathematics (STEM) degrees. This educational program will attract promising Hispanic and other low-income students in Miami-Dade County to STEM studies, ensuring their transition from high school through the first two years of college, and transfer to four-year colleges and universities. High impact practices will be incorporated into the program design in order to proactively engage students and ensure a successful STEM learning experience. To fulfill this mission, STEM Ladder has established the following goals:

1. To increase the number of Hispanic and other low-income students attaining degrees in the fields of STEM.
2. To develop mentoring and advising networks to assist students and faculty from area high school and Miami Dade College North Campus North Campus.
3. To develop model transfer and articulation agreements between Miami Dade College and four year colleges and universities in the above fields.
4. To Track students in STEM disciplines that connects high school students to post-secondary STEM majors, through two-year experience, to a four-year institution, graduation and career access.

Miami Dade College North Campus's STEM Ladder will offer participants innovative approaches to STEM education through high-impact practices that will be incorporated into the program. High school summer camps, summer research institutes, interdisciplinary teaching (Learning Communities), service learning, and undergraduate research internships at four-year institutions will lead Hispanic and low-income students to achieve STEM degrees.

**P031C110157**

**Northeastern Illinois University, IL  
Individual Development Grant**

### **ABSTRACT**

Northeastern Illinois University (NEIU), the only four-year Hispanic-serving institution (HSI) in the Midwest, proposes to improve and enhance the preparation of Hispanic and low-income (LI) students for biomedical and environmental health science careers, to create a seamless transition from two-year HSIs into science, technology, engineering, and mathematics (STEM) majors at NEIU, and to improve degree attainment of Hispanic and LI students, by using high quality, timely data in our decision making.

**The overall goal of the project** is to improve and enhance the preparation of Hispanic and LI students for biomedical and environmental health science careers. The proposed project will:

- expand and enhance courses related to biomedical and environmental health sciences, including the addition of a cadaver lab
- provide students with faculty-mentored research opportunities
- establish articulation agreements in STEM fields with area two-year HSIs
- provide support to Hispanic and LI students in NEIU's calculus sequence by implementing an Emerging Scholars Program (ESP)

In addition, NEIU will use high-quality and timely data in our decision making processes to serve the needs of the project as well as the needs of students at risk of educational failure. To make data-driven decisions regarding appropriate interventions for students at risk of educational failure, NEIU's Office of Institutional Research will use the College Student Inventory (CSI), an instrument under the Noel Levitz Retention Management System, as a means of informing decisions around retention efforts. This assessment provides data to make interventions more meaningful and relevant before a student has made a decision to stay or leave.

The ESP, an enrichment program at the level of Pre-Calculus, Calculus I, and Calculus II, at NEIU is based upon the model developed by Uri Treisman at the University of California, Berkeley in the 1980's. This high-achieving program will improve the persistence and performance rates of historically underrepresented students in mathematics (e.g., first-generation college students, Latinos/as, LI students). The laboratory improvements in the proposal will allow NEIU to add new and enhance existing courses in biomedical and environmental health sciences, meeting the needs of these growing, high-demand fields. Articulation agreements in STEM fields will be made with all ten area two-year HSIs.

As a result of the project, we anticipate: a 10percent increase per year of the Hispanic and LI students who successfully complete the calculus sequence; a 85percent increase of the Hispanic and LI students receiving STEM-related bachelor's degrees; the creation of 28 articulation agreements in STEM fields with two-year HSIs; and a 50 percent increase over the grant period of students transferring from two-year HSIs into NEIU STEM programs.

**P031C110032**  
**Seward County Community College, KS**  
**Individual Development Grant**

**ABSTRACT**

Seward County Community College/Area Technical School (SCCC/ATS) is located in Liberal, Kansas, and serves a sixteen-county, multi-state area comprising southwest Kansas, southeast Colorado, and the Oklahoma and Texas panhandles. This vast rural area (population 107,889) is characterized by high individual poverty rates (more than 17 percent) and low educational attainment (only 13 percent with bachelor's degrees. SCCC/ATS's fall 2011 enrollment was 27.5 percent Hispanic. With the Liberal school district's enrollment now 72.3 percent Hispanic, SCCC/ATS will continue to be a Hispanic-serving institution and must address the issues that limit the ability to offer Hispanic and low-income students access to high-quality programs that will prepare them for employment in highly-technical fields where the best employment opportunities lie. Pervasive deficiencies in mathematics that constitute a barrier to student success in science, technology, engineering, and mathematics (STEM) fields must also be addressed.

With state funds to support higher education declining and local funds stagnant, institutional funds are inadequate for the high start-up costs associated with highly technical programs. SCCC/ATS must, therefore, seek external funding to construct and renovate space, purchase equipment, and hire staff to develop new high-demand programs in Sustainable Agriculture Resources and Food Safety and Science, along with updating and strengthening the existing Engineering program.

These and other technical programs must also address the needs of time- and place-bound students by adding a distance learning classroom and providing faculty with professional development in distance education pedagogies. Problems with success in math will be addressed by creation of Learning Communities tied to developmental math and by establishing a new Math Lab offering computerized assistance and staffed by a qualified math instructor. To increase success of English as a Second Language (ESL) students in math and science courses, a new Bilingual STEM Assistance Specialist will develop ESL modules on math/science concepts and vocabulary and will also mentor those students.

A new Transfer Coordinator will lead the process of developing model articulation and transfer agreements with Kansas State University, Fort Hays State University, and at least one other Kansas university. In addition, SCCC/ATS and Kansas State will cooperate in developing new summer programs. One will expose local high school students to science and opportunities for STEM careers. The other, open to SCCC/ATS students, will engage them in research and internship opportunities related to both new programs.

**P031C110079**  
**Bergen Community College, NJ**  
**Individual Development Grant**

**ABSTRACT**

Bergen Community College's Hispanic-serving institution science, technology, engineering, and mathematics (STEM) proposal has been designed to prepare STEM students to fulfill the urgent and growing need for STEM professionals in a competitive and global workplace. This application has been constructed to address weaknesses in the STEM programs at Bergen Community College (BCC) that contribute to low enrollment, graduation, and transfer rates among its STEM and STEM Education students. The project has three goals:

- (1) To increase the recruitment and persistence of STEM and STEM Education students;*
- (2) To improve the graduation and transfer rates for students enrolled in STEM and STEM Education programs; and*
- (3) To enable more data-based decision making that informs and improves student outcomes, program development and articulation.*

To achieve these goals, the STEM GPS Project will create a STEM Learning Community (SLC) that will support BCC students in identifying pathways as they pursue their STEM academic and career goals. It will create programs, relationships and programs that promote interaction, connection, and encouragement of STEM students at BCC. STEM GPS will employ three strategies to create the SLC:

**Strategy One: Improving Academic Programs and Establishing Articulation Agreements** will revise and/or create new STEM and STEM Education courses and programs that promote active learning. Course sequences in each STEM program will be analyzed and better aligned. BCC will develop articulation agreements with New Jersey Institute of Technology, which will serve as a model for other four-year institutions.

**Strategy Two: Enhancing Student Support Services and Data Collection** will provide academic, career and transfer student support services that are critical to the SLC. This will include professional tutors; success preparation courses; faculty mentor-student relationships; STEM career counseling; and offering STEM internships. This strategy will also utilize a STEM database – the Student Early Alert System – which will be used to inform and improve student outcomes, program development and articulation.

**Strategy Three: Developing STEM Faculty and Facilities** will establish the foundation for the SLC – STEM Cadre and the Hispanic Bilingual Instruction Fellow in STEM (HISTEM). STEM Cadre will organize the SLC and lead the transformation of STEM instruction to an inquiry based learning approach. The HISTEM will coordinate tutoring and other support services. This strategy will also create the spaces for faculty and peer interaction, namely the STEM Learning Center and Center for Inquiry-Based Learning.

By the completion of the project, BCC will realize annual increases of 20 percent in enrollment and 50 percent in graduation and transfer rates.

**P031C110067**  
**New Jersey City University, NJ**  
**Individual Development Grant**

**ABSTRACT**

New Jersey City University (NJCU), located in Jersey City, is New Jersey's only four-year public Hispanic-serving institution. NJCU enrolled over 6000 undergraduate students and approximately 2000 graduate students in fall 2010. This student population largely consists of individuals belonging to minority groups underrepresented in the sciences (35 percent Hispanic, 21 percent African-American), 88 percent receive financial aid, and 61 percent are female. Slightly more than half of all students admitted to NJCU's undergraduate programs are transfer students, and approximately 60 percent of those enter with associate's degrees from nearby community colleges. These students aspire to complete baccalaureate degrees at NJCU, but adjust to university-level science studies with difficulty and experience a low rate of success, compared with other student cohorts.

The proposed project is titled, *Closing the Completion Gap for Hispanic-Serving Institution Community-College Graduates at a Public Hispanic-Serving Baccalaureate Institution*. The goals of this project are to: 1) Increase the number of Science majors at NJCU; and 2) improve the persistence, retention and graduation rates of Science majors at NJCU. These goals will be achieved through the implementation of the following two activities:

**Activity One: Increasing enrollment through capacity-building within NJCU's Science major programs.** NJCU will increase its capacity to educate incoming "completer" students through: 1) increased and improved capacity for teaching laboratory sciences; 2) curricular revision and alignment, both across the NJCU Science departments and with the "feeder" community colleges; and 3) standardization and dissemination of Science department Websites.

**Activity 2: Improving persistence, retention and graduation among Science majors at New Jersey City University.** Through: 1) cohort-tracking of "completer" students with the Student Early Alert System© (SEAS); 2) supplemental instruction for "completers" in upper-level Science courses; 3) Science-specific advisement for entering "completer" students; and 4) opportunities for "completers" to participate in mentored research and scientific meetings. NJCU will improve retention and graduation rates of Science major "completer" students. The Student Early Alert System, an innovative and powerful student tracking system developed specifically for NJCU, will be used to track the progress of all "completers" within Science courses and Supplemental Instruction, and to communicate academic progress issues with "completers" on an ongoing, formative basis. Improved student success and persistence will increase the number of students who remain in and eventually complete Science programs at NJCU.

**P031C110123**  
**Passaic County Community College, NJ**  
**Individual Development Grant**

**ABSTRACT**

Passaic County Community College is the only two-year, public, open admissions institution in Paterson, the third largest city in New Jersey. Accredited by the Middle States Association of Colleges and Schools, Passaic County Community College serves over 10,000 students, a predominantly low-income, Hispanic and minority student population. Facing low enrollment, completion, and transfer rates in its science, technology, engineering, and mathematics (STEM) transfer degree programs (Computer Information System), the College has established a partnership committed to moving students along key transition points in the STEM pipeline, beginning in high school and continuing through the Bachelor's degree. The project partners include two local school districts serving primarily Hispanic and low-income students and five colleges and universities in Northern New Jersey.

To improve student success, the Project will implement three essential components: 1) a pre-college outreach component that involves high school, developmental, and English as a Second Language (ESL) students in hands-on collaborative learning activities to better prepare them for postsecondary science, technology, engineering and math education; 2) a STEM improvement effort on the Passaic County Community College campus that engages students in their STEM learning and provides them with the academic and personal support needed to persist, especially in that critical first year of study; and 3) an initiative to facilitate student transfer to the university by aligning curriculum in STEM disciplines across the various levels of education, guiding students from high school to the community college to the university.

By the end of the five-year period, the Project will increase by 25 percentage points the fall-to-fall persistence rate of first-year science, technology, engineering and math students and by 20 percentage points the number of STEM majors that graduate and transfer to a college or university within three years of initial enrollment. By 2017, the Project will be serving more than 3,000 high school and college students per year, the majority of whom will be Hispanic.



**P031C110114**  
**Eastern New Mexico University, NM**  
**Individual Development Grant**

**ABSTRACT**

Eastern New Mexico University's proposed project is to increase enrollment, retention, academic success, and graduation in science, technology, engineering, and mathematics (STEM) programs, and to improve opportunities for Hispanic and low-income students to participate and succeed in STEM programs by extending access and developing instruction and service improvements. Eastern New Mexico University is a public, comprehensive four-year and graduate institution.

Over the five years of the project, Eastern New Mexico University will undertake the following initiatives in pursuit of increased STEM enrollment, success, and program completion.

1. Development of Outreach Services to Increase STEM Awareness and Preparedness of Entering Freshman and Transfer Students. In this initiative, Eastern New Mexico University develops and pilots summer bridge programs, pre-assessment of academic skills and abatement of deficiencies; and information concerning STEM career opportunities, educational and financial resources. Services are developed to help freshman and transfer students make a successful transition to postsecondary STEM study.
2. Development of Services to Increase STEM Student Success. New services include supplemental instruction and learning communities addressing common STEM "barrier" courses, math curriculum enhancement, and STEM career exploration activities. Faculty professional development activities will assist faculty members in addressing issues of engagement and high withdrawal/failure rates in large lecture sections of common STEM major required courses.
3. Development of Activities to Increase Engagement in STEM as a Career. This initiative undertakes to engage students in serious commitment to STEM as a career choice, through increased hands-on learning, professional development activities for STEM students, and development of a program of undergraduate research. This initiative is intended to result in increased readiness for employment in STEM fields and increased pursuit of advanced degrees. The project specifically addresses issues of equitable participation and success and includes strategies for increasing enrollment, retention, and success on the part of Hispanic, low income, and other populations traditionally underrepresented in STEM education and careers.

**P031C110036**  
**Mesaland Community College, NM**  
**Individual Development Grant**

**ABSTRACT**

Mesalands Community College (MCC), a Hispanic-serving institution, serves a sprawling four-county area in central New Mexico and delivers science, technology, engineering, and mathematics (STEM) programs to meet the needs of the region. An exemplary program in alternative energy technology draws students both regionally and nationally. Through its academic transfer programs and extensive dual enrollment programs, MCC also prepares students for pursuit of baccalaureate degrees in STEM fields.

The region has experienced the economic distress common to many rural areas, as evident in a high rate of poverty. Approximately 20 percent of individuals in the immediate area live below the poverty line. Symptomatic of the economic distress experienced by many residents are high rates of unemployment, and low rates of high school graduation and low levels of postsecondary educational attainment. These characteristics translate into challenges of access to postsecondary education, academic under preparedness, and low student retention and success.

Based on a planning process involving MCC faculty members and academic and administrative leaders, MCC identified gaps and deficiencies in: (1) services to strengthen basic skill deficiencies and support successful outcomes; (2) capacity to extend needed access to instruction and services; (3) laboratory facilities; and (4) services supporting transfer success. MCC has designed a project to address the deficiencies through these initiatives:

1. Improving Capacity and Quality in Math, Science, and Technology Education. This involves updating and expanding laboratory facilities on the campus, developing and revising needed courses, and providing equipment and faculty training to support the integration of technology to improve teaching and learning through such innovations as Web-based simulations and study and review materials.
2. Improving Student Access and Success in STEM Education. Through this initiative, MCC will improve the existing teleconferencing system and install a learning management system providing for synchronous as well as asynchronous distance delivery of STEM instruction, including distribution of live classes; faculty training will be provided in support of these innovations. MCC will address academic preparation, performance, and retention through development of a math-science learning center, summer bridge programs, and tutoring services for on-campus and distant students.

Through these initiatives, MCC will act affirmatively to increase postsecondary enrollment, successful completion of courses, retention, and graduation.

**P031C110059**

**New Mexico Institute of Mining and Technology, NM  
Individual Development Grant**

**ABSTRACT**

New Mexico Institute of Mining and Technology (NMT) is a Hispanic-serving, public, baccalaureate university, devoted exclusively to science, technology, engineering, and mathematics (STEM) disciplines, serving 1,383 students (26.5 percent Hispanic) in fall 2010. Located in Socorro, New Mexico, NMT has a national reputation for high-quality, low-cost STEM education.

In the State of New Mexico, NMT's primary service area, pockets of affluence and high educational attainment mask the true nature of our residents, who rank 43rd in the nation in per capita personal income (\$22,166) and 47th in six-year baccalaureate degree graduation rates (41.8 percent) for degree seeking students. However, new opportunities are emerging for those with the educational credentials necessary for high-demand, high-pay employment. Demand for Engineering graduates, in particular, is high (9-18 percent growth expected by the Bureau of Labor Statistics in 2010). Educational opportunities that increase access to, success in, and completion of Engineering degrees are urgently needed, particularly for New Mexico's Hispanic and low-income residents.

In addition, flat enrollments and funding have limited our ability to make needed changes to curricula and support. One area of potential student enrollments is transfer students. However, less than six percent of our student population has transferred in from a two-year college, despite a statewide focus, accompanied by legislation, on increasing articulation and transfer. NMT's proposed project, *Entryway to Engineering Success*, will address the need for increased educational attainment for Hispanic and low-income students in New Mexico. Our project is designed to increase their attainment of STEM degrees by developing: (1) new approaches to Mathematics and Engineering curricula and teaching methods; and (2) advising strategies specific to the first-year student, whether freshman or transfer; using student information to improve student outcomes; and developing model articulation agreements with three two-year Hispanic-serving institutions.

**P031C110087**

**New Mexico State University-Alamogordo, NM  
Individual Development Grant**

**ABSTRACT**

New Mexico State University-Alamogordo (NMSU-A), Alamogordo, New Mexico, is a public, comprehensive, open-admissions two-year institution and separately accredited branch of New Mexico State University offering associate degrees, certificates, and community / continuing education. New Mexico State University-Alamogordo serves rural, disadvantaged Otero County (population 62,776), one-third of whose residents are Hispanic, but the area offers tremendous opportunity in science, technology, engineering, and mathematic (STEM) fields for those with college educations: federal employers and private industry compete for STEM professionals and pay highly competitive salaries at all levels of employment. Unfortunately, few residents qualify: only seven percent of Hispanic adults hold bachelor's degrees, half the national average; only three percent of all students including just 35 Hispanics enrolled in New Mexico State University-Alamogordo's STEM programs in Fall 2009 and only 21 Hispanic students declared STEM majors.

Poor outcomes reflect gaps in New Mexico State University-Alamogordo's STEM programming and articulation, notably inadequate, ineffective, and outdated degree and certificate curricula, technology, and facilities. Associate of Science, General Engineering, Biomedical Engineering Tech, and Computer Graphics courses are largely text- and lecture-based, and deficient lab facilities and equipment deprive students of hands-on mastery of STEM skills.

College-level STEM tutoring is inadequate and motivating engagement strategies like Service Learning and internships are not available. Without outreach, many residents are not aware of STEM opportunities, and without robust articulation and transfer support, many students who might pursue STEM bachelor's degrees are ill-equipped to do so. New Mexico State University-Alamogordo therefore proposes ***Strengthening Science, Engineering, and Energy Career Options (SSECO)***. New Mexico State University-Alamogordo will revise AS, General Engineering AS, Biomedical Electronics Tech AAS, and Computer Graphics AAS and certificate curricula to incorporate up-to-date instructional equipment, and we will develop a new Renewable Energy AAS with four certificate programs, all with adequate, well-equipped STEM labs. New Mexico State University-Alamogordo will create effective college-level STEM tutoring, Service Learning, and internship programs to promote student success and Outreach and Transfer Support including a model articulation plan with New Mexico State University-Las Cruces.

**P031C110184**  
**University of New Mexico, NM**  
**Individual Development Grant**

**ABSTRACT**

The University of New Mexico proposes *the Project for Inclusive Undergraduate Science, Technology, Engineering, and Mathematics (STEM) Success* to reverse the trend of decreasing Hispanic STEM graduates despite increasing Hispanic enrollment at the nation's only majority-minority flagship university (40 percent of 20,655 undergraduate students are Hispanic). Located in a majority-minority state (46 percent Hispanic residents) with growing STEM public and private workforce demand, University of New Mexico needs to develop national leadership in achieving high-levels of STEM degree attainment among Hispanic and low-income students despite the challenges of location in a state with high poverty (30 percent Hispanic family poverty rate), low K-12 achievement (54.9 percent high school graduation), and decreasing state fiscal support for higher education.

University of New Mexico's project, in conjunction with nearby two-year Hispanic-serving institution (HSI), Central New Mexico Community College (CNM), focuses on widening the gateway for student success in courses that commonly represent barriers for pursuing STEM degrees in order to: (1) increase the number of Hispanic and other low-income students attaining degrees in STEM; and (2) provide a model for collaboration, transfer and articulation between two-and four-year HSIs that enhances achievement of the first goal.

The University of New Mexico STEM project has the following components: **Gateway Science and Math Course Reform:** Faculty-driven curriculum and pedagogy reform projects undertaken with Central New Mexico Community College. Research-based instructional changes along with alignment of outcomes and assessments between institutions will improve opportunities for degree attainment by University of New Mexico native students, transfer students, and those co-enrolled between the two neighboring schools. With incremental increases in reformed-course sections, a target of 7200 affected students annually is expected by the end of the grant period. **Peer-Learning Facilitators:** Peer-assisted collaborative learning to improve Hispanic and other low-income student success in STEM classrooms. Enabling active, collaborative learning in large-enrollment classes, these undergraduate facilitators will work with about 3000 students each year, supporting pedagogies known to improve learning for Hispanic students. **STEM Student Interest Groups:** Beginning-student socialization with STEM experiences that shadow STEM gateway courses and inclusively engage students in fields dominated by non-Hispanic students and faculty. Development of these new offerings will build small-group cohorts who will relate gateway-course learning to chosen STEM fields and interests and begin early contact with people and resources in the department of their potential major.

**P032C110028**  
**University of New Mexico – Valencia, NM**  
**Individual Development Grant**

**ABSTRACT**

The University of New Mexico-Valencia Campus (UNM-V) is a two-year public college of the University of New Mexico System. Established as a branch campus in 1981, the institution functions as a regional community college. 60 percent of the 2,337 headcount students for fall 2010 were Hispanic. The total operating budget for FY 2011 is \$14,175,663.

Goals: UNM-V proposes:

- 1) To increase the Hispanic and low income student graduation rate in science, technology, engineering, and mathematic (STEM) fields by 20percent over five years.
- 2) To increase the Hispanic and low-income transfer rate in STEM fields to four-year institutions in New Mexico from 21 percent to 30 percent by the conclusion of the grant.

Data-based decision-making will be central to this grant utilizing a STEM database to track enrollment, persistence, completion and transfer.

UNM-V will achieve these goals with the following components:

1. Increase overall graduation rates for STEM degrees by increasing interest in STEM majors through the development of a STEM resource center, a University Success Course for STEM majors, STEM outreach to area middle and high school students, and by use of state-of-the-art equipment and software.
2. Increase overall graduation rates for STEM degrees by increasing gateway and STEM course success through implementation of curriculum changes, hiring new faculty to implement course changes and mentor students, faculty development, and intensive supplemental instruction (SI).
3. Increase overall transfer rates in STEM majors to four-year institutions in NM by adding career and transfer advisement.

**P031C110174**

**City University of New York - John Jay College, NY  
Individual Development Grant**

### **ABSTRACT**

The project, *Creating Hispanic Scientists: A Model Science Articulation Program between Hispanic- Serving Institutions* seeks to improve persistence and graduation rates of Hispanic students through early engagement in a Model Community College Articulation Program at John Jay College. Toward this goal, a thorough review has identified the gaps and weaknesses in the existing program (literacy, advising, and accessibility) and devised strategies for increasing its effectiveness.

The specific objectives of *Activity I: Improving First Year Performance* are aimed at increasing literacy for freshman in science, developing quantitative reasoning materials to support the science curriculum, and creating research profiles that highlight the scientific contributions of Latinos. Spanish translations of the above, and building accessibility to these materials through mobile applications, are also significant aspects of the project. This effort aims to improve student performance in foundational science courses by five percent beginning in year five.

*Activity II: Transfer Transition Advising and Tracking* is aimed at creating a student tracking database that includes a virtual advisor and targeted advisement modules. The activity also includes the construction of virtual communities with partnering institutions for early career engagement. By embracing student trends in technology use, we aim to improve retention and articulation of community college students to John Jay by five percent by year four.

*Activity III: Promoting Graduation and Post-Graduate Success* builds on successful initiatives at the John Jay by developing opportunities for students at our partnering institutions to participate. These opportunities include community-building science events for freshmen, open-laboratory sessions, the expansion of research mentoring opportunities, and participation in an annual research symposium. In addition to boosting competencies, these initiatives will increase six-year graduation rates in science by five percent beginning in year four, and increase by three percent the number of science students moving on to post-graduate programs by year four.

**P031C110158**  
**City University of New York-City College, NY**  
**Individual Development Grant**

**ABSTRACT**

City College is a comprehensive teaching, research, and service institution dedicated to accessibility and excellence in undergraduate and graduate education. Founded in 1847 as the Free Academy, the College has sustained its initial mission of offering affordable access to higher education to the people of New York. The college's student body of over 16,000 students is highly diverse, with a fall 2010 ethnic profile that was 35 percent Hispanic, 25 percent Black, 21 percent Asian and 19 percent White. The college population is the results of a balance freshmen students from NY City and transfer students mostly two-year colleges within the City University System.

La Guardia Community (LaGCC) and Hostos Community College (HCC), both with high population of Hispanic students, are main source of transfer students in science, technology, engineering, and mathematics (STEM) areas. The college is a main source of professionals contributing to the competitiveness of the metro region of New York City in most fields and in particular, science, technology and engineering, with student populations in sciences and engineering comprising a total of 6,000. The college is the only campus within the City University of New York offering engineering degrees. This makes the college a key contributor to the economic growth of New York City.

To maintain the relevance of STEM fields, programs should be flexible to adapt to new demands of the society and to new technologies, making the graduates attractive to the markets. Current markets demand professionals with high degree of innovation and highly literate in information technology. STEM programs in fundamental skills and emphasizing innovation will lead to significant increases of retention and employable graduates. This is the foundation of the proposed *Initiative for Continuous Innovative Learning Environments in STEM*. We propose a coordinated set of initiatives across the pipeline designed to improve student learning, increase retention and graduation rates, and employability of our graduates anchored in a continuous learning environments.

The overall goal will be achieved through three primary activities: 1. Improve students' learning via continuous learning environments. 2. Improve students' skills needed to innovate technology 3. Improve articulation programs by extending the initiative for continuous learning.

The measurable objectives of the proposed project include: a) Increasing first-year retention rates; b) Increasing five-year graduation rates; c) Increasing academic success rates of transfer students; d) Improve overall student performance on La Guardia Community; and e) Improve employability of La Guardia Community graduates.



**P031C110179**  
**Mercy College, NY**  
**Individual Development Grant**

**ABSTRACT**

Mercy College, a private, non-sectarian Hispanic-serving institution with campuses located throughout Westchester County, Manhattan and Bronx has developed a comprehensive project under the designed to address the federal program's two absolute priorities:

(1) To increase the number of Hispanic and other low income students attaining degrees in the fields of science, technology, engineering, and mathematics (STEM); and (2) To develop model transfer and articulation agreements between two-year Hispanic-serving institutions and four-year institutions in such fields. In addressing these priorities, Mercy College also is fulfilling the College's mission to provide transformational, high-quality higher education to a student population that is predominantly Hispanic, low income and first-generation.

The project, **Step Up to STEM**, is offered in partnership with Borough of Manhattan Community College (BMCC), a large urban college that is part of the City University of New York (CUNY) and also a federally-designated Hispanic-Serving institution. IBM Corporation is supporting Step Up to *STEM* as well with student internship opportunities, professional speakers, facilities tours, and faculty access to technology-based curriculum development and teaching tools developed by the corporation.

A thorough examination of the strengths and weaknesses/gaps of Mercy College's STEM degree-granting programs in Biology, Mathematics, Computer Information System Science, Information Assurance and Security, and Psychology (please note that Mercy College does not offer Engineering) along with knowledge of the complex academic challenges faced by the target population at our institutions and nationally has resulted in the development of our project which seeks to significantly improve: a) undergraduate students' interest in STEM, b) enrollment in STEM majors, c) seamless transfer from Borough of Manhattan Community College to Mercy College as full juniors (or another four-year institution), d) persistence in STEM through to timely graduation, and e) students' attainment of the academic and technological skills, personal confidence and presence needed to secure employment in a professional STEM career or to enroll in graduate school to continue their STEM education.

Step Up to *STEM* offers a range of coordinated activities and services that will enable our project to meet its stated goals. These include: 1) Academic Enrichment and Student Support with five sub-activities; 2) Expanding Articulation Agreements and Transfer; 3) Transfer PACT and Science Technology Engineering & Mathematics Peer Tutoring/Mentoring; and 4) Project Data Collection and Analysis. *Step Up to STEM* Activity 4 addresses the Competitive Preference Priority.

**P031C110012**

**Vaughn College of Aeronautics and Technology, NY  
Individual Development Grant**

### **ABSTRACT**

Vaughn College of Aeronautics and Technology (Vaughn) has joined forces with LaGuardia Community College (LAGCC) to develop a much needed pathway for Hispanic students to Vaughn's engineering degree opportunities. The project - *Broadening the Gateway to 21st Century Engineering Degrees for Underserved Hispanic Students at Vaughn College of Aeronautics and Technology* focuses on developing two new Vaughn engineering degree programs, and it includes a model transfer and articulation agreement with LaGuardia Community College to fully articulate Vaughn's new programs. The project articulation partners are both located in Queens, New York, a service area which includes one of the most densely populated and diverse populations in America.

Vaughn is well positioned to provide the motivation for science, technology, engineering, and mathematics (STEM) education and the career-related programs that research says Hispanics must have to overcome the many obstacles to degree completion. Vaughn's history and development attest to the attractiveness of aviation and aeronautics to Hispanics. Vaughn has successfully undergone transformation from a two-year technical training college to a fully accredited four-year college offering a wide range of aviation-related technology and engineering degrees.

Most Hispanic students who enroll at Vaughn are underprepared and do not qualify to enroll in existing engineering degree programs even after participating in the college's basic skills courses. The proposed new electrical and mechanical engineering science degree programs address needs of Vaughn and LaGuardia Community College students and the service area for high-quality, modern engineering education which is designed to be more accessible to Hispanics and other underrepresented students.

HSI STEM & Articulation Program Priorities:

**Priority 1.** Increase the number of Hispanic and low-income students attaining STEM degrees.

The top priority project goal is to improve the academic success and STEM degree completion of Vaughn's Hispanic students, focusing on developing a new approach to engineering education (liberal engineering).

**Priority 2.** Enabling more data-based decision making in projects designed to improve postsecondary student outcomes.

**Priority 3.** Develop a model transfer and articulation agreement in STEM fields. The second project goal is to develop a model transfer and articulation agreement with LaGuardia Community College to increase engineering degree completion through strategic collaboration that is designed to help Vaughn improve services to underrepresented transfer students.

**P031C110080**  
**Bayamon Central University, PR**  
**Individual Development Grant**

**ABSTRACT**

Located in Bayamon, Puerto Rico, Bayamon Central University (BCU) is private, coeducational liberal arts Hispanic-Serving Institution affiliated with the Roman Catholic Church and founded by the Dominican Order in 1961. Bayamon Central University serves predominantly low socio-economic status Latinos with multiple at-risk characteristics. Among undergraduate students during 2009-2010, 97 percent received financial aid; 70 percent were female; 64 percent were academically underprepared; only 41.4 percent succeeded in core science and math courses; and, a low 12 percent of science, technology, engineering, and mathematics (STEM) declared majors graduated within six years.

**Project Outcomes:** Quality, accessible and supportive STEM programs and services will help level the playing field for disadvantaged Latino individuals in the San Juan-Bayamon Metro area. Overall project outcomes are to increase the following:

1. Participation (enrollment) in STEM programs
2. Access to a new bachelor's of STEM courses
3. Transfer of two-year HSI students into four-year STEM programs
4. Number of STEM baccalaureate degrees awarded
5. Use of STEM outcomes data to promote success and evidence-based decision-making

**Project Design and Services:**

***Improve and expand STEM Infrastructures and Resources***-renovate Science Building to improve labs and classrooms

***Increase STEM Student Participation, Success and Completion***-Summer STEM Bridge sessions for first-time entering and two-year transfer students; supplemental instruction and tutoring in science and math for academically underprepared students;

***Develop and Implement Model STEM Articulation and Transfer Processes with Partner Hispanic-Serving Institutions*** -proactive STEM transfer advising; transfer guides for students; aligning transfer STEM courses.

***Develop and Use a STEM Database Accessible at the Program and Instructor Level***-Capacity to perform cohort trend analyses and determine correlations between student success and specific project services and activities.

**P031C110046**  
**Humacao Community College, PR**  
**Individual Development Grant**

**ABSTRACT**

The project- *Equitable Access to STEM Opportunities and Clear Transfer Pathways* - has five components intended to effectively address gaps and weaknesses in science, technology, engineering, and mathematics (STEM) education facilities and resources. The goal is to provide disadvantaged students equitable access to STEM education opportunities and multiple four-year transfer pathway options.

1. Expand STEM Facilities and Instructional Resources Providing multiple STEM degree/transfer options requires expanding the Humacao Community College physical infrastructure to accommodate additional instructional and support space. Thus, a recently acquired commercial building (12,900 SF) next to the campus will be renovated to house STEM classrooms (six), computer labs (three), science labs (two) and a STEM study area.

2. Develop and Offer Three New Associate Degree Transfer-Track STEM Programs. Three promising transferrable STEM degree programs will be developed and piloted: Microbiology, Environmental Science and Chemical Technology.

3. Develop Model STEM Articulations and Transfer Services with Partner Institutions led by a curriculum/transfer specialist, general science and math courses will be aligned with three four-year transfer institutions. STEM transfer guides and transfer advising will be provided to students. The three new STEM degree programs will be articulated with InterAmerican University-Bayamon.

4. Develop and Deliver Online Instruction for Selected Science Courses Humacao Community College Science faculty will design and teach ten online science courses with an on-campus lab component. An online student readiness assessment instrument will be developed as well as online orientation, technical troubleshooting and a guide for succeeding in online courses. Faculty will be provided training in effective online design and delivery.

5. Develop and Use Database Accessible at the Administrative and Program Levels  
A new database will track STEM student enrollment, success, persistence, completion and completion for each entering STEM cohort and be the basis for decision-making.

**P031C110141**  
**The Universidad del Sagrado Corazón, PR**  
**Individual Development Grant**

**ABSTRACT**

The Universidad del Sagrado Corazón (USC) proposal, *STEMmED II: House of Science* is based on the need to increase science, technology, engineering, and mathematics (STEM) workforce to maintain the continued competitiveness of the United States and builds upon our previous College Cost Reduction and Access Act (CCRAA) STEMmED work.

Project activities have been articulated in three goals: (1) Increase the number of Hispanic and other low-income students attaining degrees in the STEM fields; (2) improve student enrollment and persistence in STEM; and (3) develop model transfer and articulation agreements between Hispanic-Serving Institutions offering two-year programs and Universidad del Sagrado Corazón.

Universidad del Sagrado Corazón has adopted the strategy to thoroughly expand the ongoing implementation of the six recommended dimensions: outreach/precollege activities, undergraduate research, infrastructure/lab renovation, faculty development, student support, and curriculum development. Universidad del Sagrado Corazón will enhance its existing articulation and transfer agreement with Borough of Manhattan Community College, as a model for implementing similar seamless articulations with other two-year programs and will run a pilot transfer program with four other Hispanic-serving institutions with two-year programs. Finally, Universidad del Sagrado Corazón will work to establish a STEM Learning Data Clearinghouse for high quality data collection and analysis on higher education, which will function in synergy with the grant's evaluation and assessment component, and in close collaboration with our proposed "House of Science", a Math & Science Learning Lab.

Project will impact approximately 600 students from 10 high schools, 700 new and currently enrolled STEM students, and 15 faculty during the project period. The proposal complies with the program's purpose, the two absolute priorities: underrepresented minorities in STEM and model articulation agreements, the competitive preference priority: enabling more data-based decision-making, and the tie-breaker provisions of this development grant.

**P031C110050**  
**Universidad del Turabo, PR**  
**Individual Development Grant**

**ABSTRACT**

Universidad del Turabo proposes the overarching goal of increasing the number of Hispanic students attaining degrees in engineering. Universidad del Turabo will develop a model transfer and articulation agreement with Mech Tech community college located in the Central-East region of Puerto Rico. The project- *Increasing Graduation Rates of Hispanic Engineering Students by Achieving Deep Learning of Concepts*-will also enable more data-based decision-making.

This project is as much about deep learning of fundamentals by the students as it is about transforming the vision of engineering education of faculty members. The program will create of two Interactive Engineering Learning Centers, IELC1 and IELC2 (**Activity I**) focused on providing direct services to engineering students; the creation of a Summer Faculty Immersion Program (SFIP) that will ignite innovative teaching in engineering courses (**Activity II**); and, to build the infrastructure required to offer a new civil engineering program that will attract 200 new Hispanic students into engineering (**Activity III**). This combination of the Interactive Engineering Learning Centers and Summer Faculty Immersion Program represents a model of the Teaching and Learning Centers recommended by the National Research Council of the National Academies.

The five-year plan will achieve the following principal measurable outcomes by the end of the grant period in September 30, 2016: (a) Increase the number of full-time degree-seeking undergraduates by 20 percent. (b) Increase the percentage of first-time, full-time degree-seeking engineering students graduating within six years of enrollment by 15 percent (from 30 percent to 45 percent). (c) Decrease by one-half the failure rates of engineering students in fundamental mid-level courses to the following: Physics I and II (33 percent), Statics (24 percent), Dynamics (20 percent), Thermodynamics 1 (16 percent), and Electrical Networks I (20 percent). (d) Double the passing rates in the Fundamentals of Engineering (FE) Exam of all engineering graduates to 45 percent. (e) Double the number of participants in the successful Multidisciplinary Entrepreneurial Program for Innovation (MEPI) from 40 to 80 students by providing the additional fabrication space in Interactive Engineering Learning Center 2. The lack of space is inhibiting expansion of the program. (f) Increase from 0 percent to 75 percent the number of engineering faculty members that use innovative teaching techniques in the classroom. (g) Increase from 0 percent to 50 percent the number of students that receive tutoring services from each of the targeted classes in the Interactive Engineering Learning Center 1.

**P031C110104**

**University of Puerto Rico – Río Piedras, PR  
Individual Development Grant**

**ABSTRACT**

The University of Puerto Rico - Río Piedras (UPR-RP): The flagship campus of the 11-unit University of Puerto Rico system, UPR-RP enrolls more than 14,000 undergraduate students, 99.7 percent Hispanic and most (92percent), officially low-income. The university serves the approximately 2.5 million inhabitants of the San Juan metropolitan area (64 percent of total PR population). Remarkably, while serving a highly socio-economically disadvantaged region, UPRRP is one of the leading Hispanic-serving institutions (HSI) in the nation, as demonstrated by its strong track record as the leading source of underrepresented minorities who go on to professional careers in science, technology, engineering, and mathematics (STEM), and its emergence as an important research center.

With 2,800 undergraduate and about 330 graduate students, the UPR-RP College of Natural Sciences has been recognized by NIH as one of the most successful U.S. institutions in development of minority professionals. One out of every 10 BS recipients of the UPR-RP College of Natural Science completes a STEM PhD. Moreover, over one third of undergraduates are involved in active scientific research projects during their college years.

UPR-RP is at a crossroads. As the island's oldest higher education institution, this university has been a leader and model for other institutions in Puerto Rico. We are the natural candidate to lead the island's effort to prepare the next generation of visionary leaders and to carry the torch for academic initiatives that may lead the way to social and economic reform. Driven by the gathering sense of a climate crisis, the notion of "green jobs"-especially in the renewable energy sector-is now receiving unprecedented attention. Yet, the university's identified significant institutional gaps in existing curricula, science laboratory infrastructure and instrumentation as well as limitations in academic support services prevent this worthy endeavor.

Thus we submit this HSI STEM application to fund an *Educational Initiative for a Sustainable Future* to: 1) Strengthen Foundational Science and Renewable Energy Curricula via creation of a Sustainability Center anchored with a "green" building and corresponding green technology laboratory as well as renovated science laboratories with up-to-date instrumentation and development of a Renewable Energy degree Specialization; 2) Faculty Development for Incorporation of Renewable Energy Concepts; and 3) Academic Support Services to Increase Student Success in STEM Courses.

The proposed project directly addresses the HSI STEM purpose of *improving and expanding HSIs capacity to serve Hispanic and low-income students* as well as Absolute Priority # 1 - *To increase the number of Hispanic and other low income students attaining degrees in STEM fields*; Absolute Priority # 2 - *To develop model transfer and articulation agreements between 2-year HSIs and 4-year institutions in STEM fields*; and the Competitive Preference Priority of *Enabling More Data-Based Decision-Making*.

**P031C110020**  
**Amarillo College, TX**  
**Individual Development Grant**

**ABSTRACT**

Amarillo College (AC), founded in 1929, is a Hispanic-serving, public, open-door, comprehensive community college located in the center of the Texas Panhandle. Mirroring the demographics of our service area, 3,564 of fall 2010 students were Hispanic (30 percent of total 11,878), many traveling to class from four rural counties with significant Hispanic populations. Residents have median family and per capita incomes 28 percent lower than the nation, and 21 percent of residents live below poverty level. Hispanic bachelor degree levels remain historically low.

Amarillo College students, consequently, exhibit a number of high-risk characteristics: 70 percent employed, 68 percent enrolled part-time, 75 percent of all (81 percent Hispanic) fall 2010 first-time students were first-generation college students, and 48 percent received Pell grants. An overwhelming percentage of Amarillo College students (nearly 84 percent) require remediation in math. Each year over 4,700 students (33 percent of whom are both Hispanic and low income) enroll in math courses, and each year an average of one-third (over 1,500) fail.

As a top institutional priority, Amarillo College proposes *Amarillo College Science, Technology, Engineering and Mathematics (STEM): Succeeding Together in Engineering and Math* to increase success and graduation in STEM disciplines and transfer supported by a model articulation agreement for Hispanic and low-income students. Re-designed mathematics curricula, comprehensive assessment, and the infusion of technology into the instructional environment will address the needs of students at risk of failure throughout the mathematics sequence. To encourage students to follow high-demand engineering pathways, later courses in the math sequence will be paired with introductory Engineering courses, helping students transfer skills across STEM disciplines and find meaningful applications of their learning. The development of new data collection and analysis capacities will support the use of evidenced-based strategies.

An on-campus STEM Success Hub and Website will be developed to support student success, providing extended learning environments for students who need additional time, support, and encouragement as they overcome their deficiencies and math anxiety. To ensure that first-generation college students and low-income students find clear, affordable pathways to high-demand careers, a Transfer Articulation and Financial Responsibility Hub and Website will incorporate transfer and financial advising strategies, articulation assistance, and joint degree audits developed for a model articulation agreement in Engineering for transfer to West Texas A&M University (WTAMU).



**P031C110090**  
**Coastal Bend College, TX**  
**Individual Development Grant**

**ABSTRACT**

Coastal Bend College (CBC), a midsize community college in rural south Texas, strives to meet the needs of its population at its main campus in Beeville, Texas and at each of its outreach sites in Alice, Kingsville, and Pleasanton. Hispanics make up the majority of the student body at 64.63 percent classifying CBC as both a minority-serving institution and a Hispanic-serving institution (HSI).

Through Project *OASIS (Optimizing Academic Success in the Sciences)*, Coastal Bend College will advance the educational achievement of Hispanic and other disadvantaged individuals in the Coastal Bend College service area by improving teaching and learning in science. Set as the Project's goals are the two HSI Science, Technology, Engineering, and Mathematics (STEM) & Articulation Program priorities:

**Goal and Absolute Priority 1:** Increase the number of Hispanics and other low income students obtaining degrees in STEM fields; and

**Goal and Absolute Priority 2:** Develop model transfer articulation agreements between two year Hispanic-Serving Institutions and four year institutions.

Project objectives for Goal 1 will focus on increasing student attainment by:

1. Modernizing physical and virtual learning spaces of Coastal Bend College's science program.
2. Increasing passing rates in eight science gatekeeper courses and three math courses STEM majors by 5-9 percent.
3. Increasing the number of select STEM majors by 20 percent
4. Providing case management to 600 science students to increase participant retention and persistence rates by nine percent.
5. Providing other student services to students enrolled in the eight science gatekeeper courses.
6. Providing additional educational access to Hispanic and others underrepresented in college through a new Every-Other-Weekend-College.
7. Base-lining and increasing the graduation and university transfer rates STEM majors 10 percent.
8. Increasing professional development to faculty and staff.

Project objectives for Goal 2 include:

1. Expanding degree transfer articulation agreements in science and other STEM fields from 3 to 25.
2. Articulating cooperative efforts with universities to increase Coastal Bend College's student performance and interest in STEM areas.
3. Sharing former Coastal Bend College student graduation information for five year completion of a university degree.
4. Add-on modules to Coastal Bend College's biology course - 1408.

**P031C110077**  
**Del Mar College, TX**  
**Individual Development Grant**

**ABSTRACT**

Del Mar College (DMC) is a public two-year institution founded in 1935 and located in Corpus Christi, Texas. The College has an enrollment of over 12,000 with a 59 percent Hispanic enrollment. DMC will service 4½ counties along the Gulf Coast to include Nueces, Aransas, San Patricio, Kennedy, and part of Kleberg. DMC proposes the *HSI Science, Technology, Engineering, and Mathematics (STEM) Success Initiative*.

**Component 1:** Expansion of Academic Structures will increase the number of first-time in college degree seeking majors in STEM; increase the number of STEM degree completions; and create and enhance transfer and articulation agreements with four year institutions. This Component will use informational outreach activities through the public school systems and College to inform students of DMC programs; follow STEM declared majors through a degree, and further assist these students with transferring to four year institutions.

**Component 2:** Develop and Enhance Support Systems will be a concerted effort by the College to provide extensive STEM advising and educational support to declared STEM majors. The component is designed to improve STEM retention, completion and transfer rates. Intensive Supplemental (SI) and tutoring services will be provided for STEM majors. Advisors will be physically located in their respective departments to allow students direct access to information and advising in diverse STEM career pathways. This component will also support the enhancement of STEM learning spaces by updating various learning labs through renovations and/or construction.

**Component 3:** Instructional Redesign will provide professional development for faculty that will improve instructional classroom strategies. Experts from various STEM fields will be scheduled to present on the DMC campus and faculty will attend conferences to bring back information, new ideas and strategies and technology for the classroom. Integrating new technologies through the multiple tutoring centers on campus and in the classrooms is essential to the success of the grant.

**P031C110086**  
**El Centro College, TX**  
**Individual Development Grant**

**ABSTRACT**

El Centro College (ECC) proposes to increase the number of Hispanic and other low-income students attaining degrees in the fields of science, math and technology and develop model transfer and articulation pathways with four-year colleges and universities in science, technology, engineering, and mathematics (STEM) fields.

ECC, the oldest of seven colleges in the Dallas County Community College District, serves ethnically diverse, economically disadvantaged and increasingly Hispanic neighborhoods. Although ECC offers pre-professional courses transferable to four-year institutions, it has a distinctive and historical competency in technical occupational training in more than 40 fields with few transfers. With this project, ECC will:

1. Implement new STEM specific student support services, including advising, transfer, and career planning services.
2. Develop and implement new contextualized curriculum and add missing articulation pathways through the development of new courses, working with four-year universities to add articulated pathways and assure alignment of pre-requisite courses.
3. Enhance student learning engagement in STEM fields by renovating dated science and technology lab facilities and developing experiential learning opportunities through mentored internships.
4. Develop a pipeline for STEM enrollment through STEM specific outreach activities at local schools and community events and providing STEM workshops and seminars on and off-campus.

**P031C110099**  
**Galveston College, TX**  
**Individual Development Grant**

**ABSTRACT**

Galveston College (GC), located on Galveston Island within the city and county which bears the same name, serves a region of the Texas Gulf coast punctuated by socio-economic dichotomies. In addition to this public community college, Galveston Island is also home to the University of Texas Medical Branch at Galveston (UTMB) and Texas Agricultural & Mechanical (A&M) University at Galveston (TAMUG). These two institutions bring a number of highly educated professionals with higher incomes to the island, raise the socio-economic demographics of the region, and inadvertently mask the hardships endured by the majority of area residents.

In 2008, the region was hit hard by Hurricane Ike. The area is still facing the aftermath of the hurricane's more than \$29 billion in damages. For Galveston College, the historic storm compounded challenges and contributed to an enrollment drop. Galveston College's student body is reflective of the region's lowest socio-economic characteristics. While Hispanic enrollment has increased significantly over the past decade, the College's six year cohort graduation/persistence rate for Hispanics has dropped by almost 10 percentage points in that same time period. The dearth of educated Hispanics in the region is contributing to low Latino representation among the region's professionals and exacerbating low socio-economic demographics of the area's largest minority population.

Yet opportunities for life improvement and successful career attainment, particularly in science, technology, engineering, and mathematic (STEM) related industries are plentiful in this region. The Johnson Space Center (JSC) is located just 30 miles from Galveston. The National Marine Fisheries Service's (NMFS) and the newly opened National Thermodynamic Laboratory (NTL) are located in Galveston. These entities have a very far reach and generate a host of ancillary STEM related career opportunities for individuals with the appropriate levels of education.

Furthermore, GC has well established relationships with the region's four-year universities. The proposed project is titled, *Expanding STEM Pathways*. Funds have been requested to: 1) Strengthen foundational science and general STEM curricula through laboratory renovation and instrumentation; 2) Expand academic programming through development of Engineering, Engineering Technology, and Computer Science courses that are fully transferrable to area universities; and 3) Develop academic support services inclusive of a Summer Intensive Math Immersion program, comprehensive tutoring and supplemental instruction. Articulation agreements will be formalized with Lamar University, the University of Houston, University of Houston at Clear Lake, and Texas A&M University and collaborate with faculty and staff from these universities to ensure curricular alignment and facilitate transfer into a baccalaureate degree program.

**P031C110093**  
**Howard College, TX**  
**Individual Development Grant**

**ABSTRACT**

HSI STEM & Articulation e-Science & Technology (START) represents *E-START* and is designed to help eliminate many problems identified at Howard College including: a lack of distance learning options; a shortage of necessary equipment; a need for additional professional development opportunities for faculty; and a low student transfer rate. These problems identified through a self-study and our 10-year accreditation review will be addressed through the development of support activities that will enable Howard College to increase the services provided to students, especially minority and low-income students.

The project will produce clear outcomes, addressed through four components:

- Component 1: Summer Enrichment Activities
- Component 2: Improving STEM Courses and Capabilities
- Component 3: Increasing Professional Development Activities
- Component 4: Building a Stronger Pipeline to Four-Year Institutions

**P031C110187**  
**Laredo Community College, TX**  
**Individual Development Grant**

**ABSTRACT**

Laredo Community College (LCC), 9,264, total undergraduate FTE 6,781, 96percent Hispanic, fall 2009, a Hispanic-serving institution (HSI) located in Laredo, Texas, requests funds (\$4,350,000) through the HSI Science, Technology, Engineering, and Mathematics (STEM) & Articulation Program for the purpose of improving and expanding its capacity to improve the academic attainment of Hispanic students and other low income individuals, to increase the number of these students attaining a postsecondary degree in STEM and to develop a model articulation agreement (Absolute Priorities) by using best practices based on research and analysis to: 1) provide the academic support through summer bridge programs in STEM, trained faculty mentors and trained student/mentor tutors; 2) provide student support in the form of academic advisors, a first-year experience, Web-based academic advising, degree audit, and transfer articulation tools to help students and the advisors negotiate curriculum requirements and those required for easy transfer; 3) develop and implement a model transfer program with Texas A & M Kingsville College of Engineering, including teleconferenced courses in orientation to engineering; and 4) to collect, analyze, and use high-quality and timely data, including data on program participant outcomes, for the purpose of documenting the improvement of postsecondary student outcomes relating to enrollment, persistence, and completion and leading to career success. These components are crucial to increase retention and success for students, especially STEM majors who come from disadvantaged backgrounds.

This proposal includes an independent external evaluator to assess the project's evaluation plan and activities to determine linkages between the proposed activity interventions and successful outcomes. The proposed project is central to the institution's plans of improving student retention within instructional units and its objectives for Instructional, student support, and for economic and community development which include, but are not limited to establishing over the next three years community and regional relationships that promote the following: a. educational collaborations with school districts; b. Economic initiatives with business and industry; and c. Collaborative programs with local, state, and federal agencies (*LCC Strategic Plan 2009-2012*). LCC has addressed the two absolute priorities and it has also addressed the competitive preference. It has included activities including, but not limited to student services, joint use of facilities for teleconferenced courses, and faculty development.

Activity: Increasing STEM Student Success: Integrating Advising, Teaching, and Learning  
LCC will use grant funds for one major Activity with 4 interrelated components.

**Component 1:** Academic support and enhancement: 1) providing the academic support through summer Bridge programs in STEM; 2) trained faculty mentors; 3) trained student/mentor tutors; 4) enhanced science and mathematics technology;

**Component 2:** Student Support 5) providing student support in the form of academic advisors, a first-year experience, 6) Web-based academic advising, degree audit, and transfer articulation tools to help students and the advisors negotiate curriculum requirements and those required for easy transfer;

**Component 3:** Model Transfer Program 7) developing and implementing a model transfer program to Texas A&M Kingsville College of Engineering, 8) including teleconferenced courses to accelerate transfer and connection, and completion of STEM degrees; and

**Component 4:** Use of data 9) by collecting, analyzing, and using high-quality and timely data, including data on program participant outcomes to document student outcomes' improvement.

**P031C110051**  
**Lee College, TX**  
**Individual Development Grant**

**ABSTRACT**

Lee College, an Achieving the Dream participant, is a minority-serving and Hispanic-serving institution, with 54.2 percent of its 5,987 spring 2011 enrollees being of a race other than Caucasian. Hispanic students make up 30.2 percent of the student population, and African American students account for 20.0 percent (spring 2011). First generation students comprise 62 percent of the student body. The college is located in a Texas Enterprise Zone where 30 percent of the residents live below the poverty line, and over 65 percent of K-12 public school students in our district are on the free/reduced lunch program. Over 50 percent of Lee students are on financial aid, and 42 percent are on Pell Grants. Lee College is located in Harris County where 22 percent of the population is foreign-born and 36 percent speak a language other than English in the home. Fifty-six percent of the population living near the college is Hispanic and 33 percent speak a language other than English at home.

Over the five years of the Science, Technology, Engineering, and Mathematics (STEM) and Articulation Transformation (SAT) project, Lee will transform STEM education at the college and create more robust articulation agreements with four-year institutions. The SAT project is multi-faceted, but serves one common purpose – student success in STEM courses of study.

The project design includes the following initiatives and services that are supported by research and best practices: course enhancements and revisions in math, science and process technology; creation of two science studio learning environments, and a STEM Learning Center that includes a computer lab and opportunities for tutoring and mentoring; implementation of Math Boot Camp, a summer bridge program; family involvement opportunities such as Café Con Leche, informal discussions for family members will address barriers for Hispanic and low-income students in attending and completing college and Tipping Point speaker series will include presentations to participants and their families by successful professionals with backgrounds similar to participants; Outreach activities targeting high school and Lee College math students enrolled in developmental courses; financial literacy initiatives; providing professional development for faculty; creating a transfer center to ensure a smooth transition that minimizes costly loss of credit and duplication of coursework; and implementing a model articulation program between Lee College and the University of Houston, as well as expanding articulation agreements to include more universities statewide.

The project will be supported by institutional resources, as well as partnering organizations such as ExxonMobil, the East Harris County Manufacturing Association, National Aeronautics and Space Administration and local school districts.

**P031C110072**

**Lone Star College – North Harris, TX  
Individual Development Grant**

### **ABSTRACT**

A Hispanic-serving institution and public, comprehensive, two-year college in Houston, Texas, Lone Star College—North Harris (LSC-NH) serves a majority-minority student body, more than a third (5,561) Hispanic; 29 percent of all students are low-income and 62 percent are women. Although the area has built a dynamic science, technology, engineering, and mathematics (STEM) based economy, participation requires education, and only 10 percent of the area's Hispanic residents—42 percent of the population—hold bachelor's degrees. And so, 39 percent of all area families but 60 percent of Hispanic families are low-income, and Hispanics' median family and per capita incomes are only 45 percent and 37 percent of Caucasians.

LSC-NH's enrollment is growing rapidly, 21 percent last year alone, but retention rates are well below national averages (40 percent vs. 54 percent, ACT 2009); less than a third of Associate degree-seekers graduate and only about a quarter transfer in 150 percent of program time. Associate of Science degree awards are scarce, just 12 percent per year. A major barrier is the completion of degrees' math requirements. Seven key courses enroll more than 4,000 students annually (25 percent of LSC-NH students), but withdraw, retake, and failure rates are high.

Hispanic students (42 percent of all math enrollees) especially struggle, and too many Hispanic women choose not to enroll in higher-level math: only 31 percent - 44 percent of Trigonometry through Calculus III students are Hispanic females although they make up 60 percent of our Hispanic students. Weaknesses in LSC-NH math courses are largely the reason. Primarily lecture-based, they seldom engage diverse students with contextual, experiential, collaborative, technology-based instruction. Instructional technology is limited to projecting calculators and overhead projectors, and few classrooms serve our growing math enrollment. Academic support for college-level math students is also inadequate, and insufficient resources have denied faculty development in techniques and technologies effective with at-risk students.

LSC-NH, therefore, proposes *Math Success* to improve math students' success. The project includes extensive faculty development, revising seven key math courses to improve their effectiveness, revising or converting four online options for increased access, renovating two math classrooms and a Math Success Center, installing interactive instructional resources in the Center and twelve classrooms, creating outreach and success strategies, and pursuing a model transfer - articulation plan with the University of Houston.



**P031C110083**  
**Mountain View College, TX**  
**Individual Development Grant**

**ABSTRACT**

Located in Dallas County, Mountain View College (MVC) primarily serves the residents and workers of Dallas, Duncanville, Grand Prairie, and Cedar Hill. As part of this application development process, staff generated a census tract report from the U.S. Department of Justice's Socioeconomic Mapping and Resource Topography (SMART) system. 60 percent of the census tract population speaks Spanish, the per capita income is \$9,490 and 47 percent of families live in poverty.

At MVC staff and faculty firmly agree that much needs to be done in our predominantly Hispanic community to increase the access to - and demand for - science, technology, engineering, and mathematics (STEM) education. MVC is therefore pleased to request funding for STEM SUCCESS to increase the number of Hispanic (and other low income) students who will attain their STEM degree and transfer to a four-year institution of higher education. As part of this effort, staff will utilize student data to promote a STEM SUCCESS community with education and industry representatives who will actively engage in the establishment of a data-based decision-making environment to advance *HSI STEM and Articulation Program* goals while attaining STEM SUCCESS goals, objectives and outcomes.

**Activity One:** initiates programs to help increase Hispanic and other low-income students into fully articulated STEM degree pathways. **Component One** includes an array of STEM awareness, exploration and engagement activities designed to foster and sustain interest in STEM fields of study. **Component Two** addresses the need to establish a STEM Learning Community at Mountain View College to help identify the critical transition points that impact STEM student success.

**Activity Two:** focuses on the need to establish data usage and analysis while working with the STEM SUCCESS team to improve postsecondary student outcomes leading to degree attainment and degree success.

**Activity Three:** is designed to establish model articulation agreements with four-year Institutions of Higher Education and support STEM SUCCESS with the provision of professional development initiatives - a Professional Learning Community to complement the STEM Learning Community.

This program design addresses each component identified by researchers as being a variable impacting Hispanic student success: student-centered engagement (field-research experiments and 3-D environments), faculty development (Professional Learning Community), and expanding opportunities for students to consistently engage with STEM faculty and industry professionals (STEM Learning Community and *STEM Connections* Council) in a STEMcentered environment of exploration and collaboration (shared research project between faculty and students in STEM Learning Community).

**P031C110071**  
**Palo Alto College, TX**  
**Individual Development Grant**

**ABSTRACT**

**Palo Alto College (PAC)** in San Antonio, Texas, founded in 1983 by the Alamo Community College District, is an open enrollment two-year public community college with a headcount of 8,965 students in fall 2010. Palo Alto College has a large Hispanic population and serves traditionally underrepresented students in science, technology, engineering, and mathematics (STEM) disciplines. Palo Alto College proposes a project that will enable talented, financially-needy Hispanic students to secure a first-rate education and receive the support and preparation they need to transfer and graduate with degrees in science, technology, engineering and mathematics. The overarching goals of the project will focus on improving instruction through faculty development, ensuring student success by providing enhanced services to STEM students, providing academically enriching experiences, and financially supporting students.

***Faculty Development***

**Goal:** To significantly increase the academic success of Hispanic and low-income students through professional development of faculty.

***Student Success***

**Goal 1:** To significantly increase the transfer and degree attainment of Hispanic and low-income students through the creation of the Intrusive Academic and Career Advising/Planning Program that will provide intrusive advising students.

**Goal 2:** To significantly increase the academic success of Hispanic and low-income students through coaching services for students at risk of failing or dropping out.

**Goal 3:** To significantly increase the number of students enrolled in STEM majors by creating a Summer Institute to interest incoming freshman in STEM fields.

***Academic Enrichment***

**Goal:** To significantly increase the academic success of Hispanic and low-income students through expansion of the Science Exploration Lab Center to create new educational opportunities.

***Fiscal Support***

**Goal:** By 2016 Palo Alto College will have significantly increased the amount of external funding available for student scholarships and program development.

To meet these goals, we have identified several high priority needs and propose four major activities: 1) professional development to educate faculty; 2) creation of the Intrusive Academic and Career Advising/Planning Program (IACAPI); 3) expansion of the Science Exploration Lab Center; and 4) increasing the amount of external funding available through an endowment.

**P031C110017**  
**Sul Ross State University, TX**  
**Individual Development Grant**

**ABSTRACT**

Sul Ross State University (est.1917), a Hispanic-serving institution for decades, is located in Alpine, Texas (population 6,431). As a public, comprehensive, open-door institution, Sul Ross is the sole source of higher education in a vast, remote region. As the gateway to “Big Bend Country,” Sul Ross primarily serves a rurally-isolated, low-income population spread across a 19-county, 45,651 square-miles, sparsely populated service area. The region is a crucible of cultures: Native American, Spanish, Mexican, and Anglo. From the slowly winding Rio Grande River to the vast expanses of the Chihuahuan Desert and Davis Mountains, the culturally rich but impoverished people along the 1,200-mile Texas-Mexico border have historically looked to Sul Ross for education that may lead to a new way of life. Virtually all of our students come from this economically and educationally disadvantaged region. Proposed project is titled, “*Computer Science Initiative-SRSU.*”

While Sul Ross is committed to fulfilling its comprehensive mission of access and success for area residents, funds have not been available to resolve documented institutional gaps and weaknesses in curricula, services and infrastructure, which threaten our ability to expand access to science, technology, engineering, and mathematic (STEM) education and increase student success for Hispanic students. Students need access to computer science programs that will prepare them for high-demand, high-wage jobs, but our present degree programs are unable to fill this need, and we have insufficient resources to invest in the faculty release time and technology necessary for updating an extremely outdated and inadequate Computer Science major.

The purpose of the proposed project, “Computer Science Initiative” or CSI-Sul Ross is to increase Hispanic and other low income students’ attainment of STEM degrees and provide new pathways to these degrees for students in our vast region through establishing articulation agreements with two-year colleges. The project will: 1) update existing curriculum in the Computer Science major; 2) expand the offerings in this major to provide concentrations in high demand fields: Gaming Technology, Communication Technology, Information Technology Security, Criminal Justice Technology or pure Computer Science; 3) update the Tutoring Center to help increase student academic success, especially in mathematics, an essential foundation for Computer Science majors; and 4) provide faculty development.

**P031C110118**

**Texas A&M International University, TX  
Individual Development Grant**

**ABSTRACT**

Texas A&M International University, a Hispanic-serving institution (HSI) in Laredo, Texas, proposes a HSI Science, Technology, Engineering, and Mathematics (STEM) & Articulation Program *SYSTEM: Serving Youth in STEM* to increase the number of Hispanic and low-income students attaining STEM degrees. SYSTEM will increase the production of a continuous stream of highly competent and well-qualified scientists and engineers. This goal will be achieved through the vigorous and cost-effective implementation of a number of activities such as: tutoring, advising, mentoring, a specialized technical writing class, research experience, internships, recitations, workshops and financial assistance. Pursuant to this goal, SYSTEM activities/services will be categorized into three main areas: outreach, retention and graduation of our target area students and their parents in accordance with the Memorandum of Understanding (MOU) for the Joint Admissions Program between Texas A&M International University and Laredo Community College (LCC), which is expected to be signed by June 2011. The goals of SYSTEM will be attained as follows:

Absolute Priorities 1 and 2: SYSTEM will increase the number of Hispanic and other low income students who complete STEM degrees. The project also proposes a model transfer agreement that builds on a current articulation agreement with Laredo Community College (LCC) to specifically include a seamless transfer to systems engineering.

**Outreach:** With a main goal of reaching 6500 area students including those from the local and surrounding school districts and Laredo Community College by: 1) Providing bilingual academic advising specific to STEM fields offered on both campuses, 2) Providing a bilingual Website, 3) Providing bilingual brochures, and 4) Strengthening the current Memorandum of Understanding with Laredo Community College to include systems engineering.

**Retention:** Improve the rate by 25 percent each year of the grant by performing the following activities: 1) Summer engineering workshops; 2) Math and chemistry tutoring; 3) A specialized STEM Technical Writing Class; 4) Bilingual academic advising specific to STEM fields offered on both campuses; 5) Chemistry recitations and supplemental instruction; 6) Mentoring programs provided by faculty and industrial leaders; 7) Paid internships and research opportunities; and 8) Scholarship from the endowment.

**Graduation:** Improve the rate at which science, technology, engineering, and mathematics (STEM) students in undergraduate research and internship program graduate to 80 percent by: 1) Faculty mentoring; 2) Industrial leader mentoring; and 3) all retention activities.

**P031C110015**

**Texas A&M University-Corpus Christi, TX  
Individual Development Grant**

### **ABSTRACT**

Science, Technology, Engineering, and Mathematic (STEM) Outreach, Access, and Retention (SOAR) is a project led by Texas A&M University-Corpus Christi (TAMUCC) that aims to increase the percentage of Hispanic students seeking STEM degrees and graduating within six years of enrollment. STEM SOAR also focuses on increasing the number of Hispanic students who transfer from an Hispanic-serving institution (HSI) community college to an HSI university. STEM SOAR plans to do this through a three pronged approach that includes capacity building through renovations and upgrades to facilities, a retention program to keep students succeeding, an articulation program, and faculty development program that will enhance the overall teaching capabilities and classroom environment.

The project will provide needed services and programs aimed at assisting Hispanic, first generation, low-income, and traditionally underrepresented students who are either transferring from a community college into a STEM program, or are first time in college students in a STEM field at TAMUCC. STEM SOAR will also focus on offering programs and seminars to faculty and staff who work with the targeted student population on a regular basis.

**Component One:** STEM Success Center will focus on: (1) increasing the number first time in college and transfer Hispanic students passing and persisting; and (2) increase the number of first time in college and transfer Hispanic students graduating with degrees within three to six years.

**Component Two:** STEM Articulation Agreement Program will focus on: (1) increasing the number of Hispanic and/or low-income students who transfer from a Coastal Bend community college into a STEM major; and (2) creating three Articulation Agreements in STEM areas with Del Mar College, Coastal Bend College, and Victoria College.

**Component Three:** STEM Resources and Development will focus on: (1) renovating and upgrading ten classrooms/laboratories; and (2) enhancing the professional development programs offered on campus to faculty and staff.

**P031C110173**

**The University of Texas at San Antonio, TX  
Individual Development Grant**

### **ABSTRACT**

The University of Texas at San Antonio (UTSA) accepts the challenge to increase the number of Hispanics in its various science, technology, engineering, and mathematic (STEM) related degree programs by collaboratively working with Northwest Vista College (NVC) in the Alamo Community Colleges district in San Antonio, Texas with nearly 50 percent Hispanic students.

The major goal of the *Academy for Teacher Excellence I3 Communities of Practice* is to strengthen a model of collaboration between UTSA and Hispanic-serving community colleges where STEM courses are aligned and instruction is enhanced to ensure that Hispanic and other low-income students are college ready and can graduate at UTSA. As a result of Academy for Teacher Excellence I3 Communities of Practice, University of Texas at San Antonio proposes to address Absolute Priority 1 (to increase the number of Hispanics and other low income students attaining a degree in STEM fields through a three-pronged approach by: (1) enticing and supporting 30 Hispanic freshmen and 45 sophomore students each year with undeclared majors to enroll in a STEM teacher preparation program and be certified to teach a STEM related area in campuses with high concentrations of Hispanic students; (2) enrolling 50 high school, community college, and UTSA faculty in the STEM related area each year in communities of practice to enhance their knowledge of a STEM area and in the pedagogy of diversity in a classroom; and (3) increasing the number of Hispanic high school students participating in dual credit classes in a STEM area by 25 each year as a way of establishing a bridge to the university and increasing their interest in the STEM areas.

In addition, UTSA seeks to increase the number of Hispanic teachers prepared to teach STEM areas in the EC-12 grades in schools with high concentrations of Hispanic students. UTSA proposes to address Absolute Priority 2 (develop a model transfer and articulation agreement with a two year Hispanic-serving institution) by channeling resources to work collaboratively with local NVC, specifically with Texas Institute for Educational Robotics (TIER) to increase the number of Hispanics who succeed in freshmen and sophomore STEM courses and the number who transfer to UTSA to complete a bachelor's degree.

**P031C110030**  
**Western Texas College, TX**  
**Individual Development Grant**

**ABSTRACT**

Western Texas College (WTC), located in the rural town of Snyder, serves a 10-county state-designated service district (pop. 81,204) that encompasses 9,231 square miles. WTC is the only comprehensive public community college for the residents of its service area, the majority of who are educationally and economically disadvantaged. Per capita income is very low (\$17,954) as evidenced by the three fourths of our minority children in the free/reduced lunch program; less than 15 percent of adults completed college and almost 30 percent did not finish high school.

While poor socio-economic characteristics have remained a constant in the area, in recent years we have witnessed a dramatic shift in the ethnicity of our community. Hispanic residents are the region's fastest growing ethnic group with 51 percent of school-age children reported as Hispanic. Among some area school districts, Hispanics comprise up to 66 percent of all students.

Thus we submit this proposal for *Creating Science, Technology, Engineering, and Mathematics (STEM) Pathways for Hispanic and Low-Income Students*.

We propose to:

- 1) Strengthen foundational science and engineering pathways curricula through laboratory renovation and instrumentation;
- 2) Develop two high-demand Technology associate degree programs transferrable to area universities;
- 3) Develop academic support services inclusive of a Summer Math Bridge Academy, and comprehensive tutoring and supplemental instruction.

The proposed project directly addresses the program purpose of improving and expanding Hispanic-serving institutions' (HSI) capacity to serve Hispanic and low-income students as well as Absolute Priority # 1 - To increase the number of Hispanic and other low income students attaining degrees in STEM fields; Absolute Priority # 2 - To develop model transfer and articulation agreements between two-year HSIs and four-year institutions in STEM fields; and the Competitive Preference Priority of enabling more data-based decision making.

**P031C110007**

**Wharton County Junior College, TX  
Individual Development Grant**

### **ABSTRACT**

This Hispanic-serving institutions science, technology, engineering and mathematics (STEM) proposal is an individual development grant by Wharton County Junior College (WCJC). The STEM Success Project focuses on one activity: student learning and success in STEM fields of study, with three integrated components: 1) Planning, development, and establishment of a comprehensive STEM Success Center integrating STEM academic and student support services; 2) Revising and upgrading courses and programs, and focusing faculty development on STEM related issues; and 3) increasing STEM articulation agreements among WCJC and four-year universities.

Data on enrollment, persistence and academic success rates for Hispanic and other low-income students in STEM courses at WCJC provide strong evidence of the need for improvement. Building on research and literature related to STEM success, including best practices, WCJC will create, refine, expand, and improve an integrated series of activities that will better address the needs of our Hispanic and other low-income students.

This project creates a STEM Success Center designed to provide these targeted students the academic support services needed to improve success as well as specific assistance to explore and engage in STEM fields of study, careers, and transfer to a university. Through the Success Center, targeted students will experience project-based learning, counseling and advising, hands-on and interactive supplemental instruction and tutoring, and a multitude of multimedia and library resources as well as STEM Summer Bridge programs; STEM career, transfer, and study skill courses; financial aid and scholarship information; workshops and seminars; and other needed resources or referrals.

A core aspect of the WCJC STEM Success Project will be to review, and where needed, revise courses and programs, improve the quality of transfer pathways and articulation agreements, and provide faculty development programs. In working with partnering universities, WCJC seeks to address STEM articulation of standards and improvements in the preparation of students before transferring while exploring faculty development through faculty exchanges, internships, mentor programs, and STEM research.



**P031C0110167**  
**Big Bend Community College, WA**  
**Individual Development Grant**

**ABSTRACT**

Big Bend Community College (BBCC), Moses Lake, Washington, is a two-year, publicly-supported Hispanic-serving institution (HSI), located in a remote area of south central Washington, where only 14 percent of the population (and four percent of the Hispanic population) has completed a college degree, compared with 27 percent nationally. Further, 45 percent of the Hispanic population and 23 percent of the overall population live at low-income levels, compared with 18 percent nationwide (Census, American Community Survey, 2009 Data Sets, Table B17022). The two-county service area (population 105,000) has a Hispanic population of 40 percent, with the college's Hispanic enrollment increasing by 50 percent in the past five years (BBCC Institutional Research, 2011).

While Hispanic families have primarily been drawn to the area to work in the area's fertile farm fields, the area is also known for its bountiful and inexpensive water supplies, which have drawn numerous high tech industries to the area, including Intuit, ask.com, BMW, Genie, and Yahoo. These industries (and Pacific Northwest National Laboratory –a major Department of Energy research center in Richland, Washington, share a common need for engineers and other science, technology, engineering, and mathematics (STEM) professionals, which unfortunately are in short supply in this rural service area.

In completing STEM degrees, BBCC students are hampered by their inability to cross “the math barrier,” with 91 percent of all students and 95 percent of Hispanic students requiring math remediation. In addition, most BBCC students have little if any knowledge about the opportunities available in STEM fields. The college, too, is hampered by inadequate STEM facilities, instrumentation, and technologies, and a related lag in adopting more effective instructional and support strategies. The college also lags in providing strong Engineering programs for students who could potentially realize a dramatic improvement in their living standards by completing an associate degree in pre-Engineering or other STEM fields and transferring to a four-year university to continue and complete their study.

To address these and other “gaps,” BBCC proposes project goals aimed at: (1) increasing, by 50 percent, the number and percent of BBCC's Hispanic and predominantly low-income students who complete a degree and transfer; and (2) developing articulation/transfer models in new Engineering programs, with at least 60 percent of the Engineering enrollees transferring to four-year universities. Each of these goals is accompanied by objectives and outcomes that will be measured by collecting and analyzing high quality data to continually improve the project's components and outcomes.

The proposed project addresses the Absolute Priorities of the HSI STEM & Articulation Program: (1) to increase the number of Hispanic and other low-income students attaining degrees in STEM; and (2) to develop model articulation/transfer agreements between two-year HSIs and four-year institutions in such fields. It also addresses the Competitive Preference Priority, which is to enable sound decision-making by collecting, analyzing, and using high-quality and timely data related to program participant outcomes, including enrollment, persistence, and completion leading to career success.

**P031C110182**  
**Heritage University, WA**  
**Individual Development Grant**

**ABSTRACT**

Heritage University (HU), a private, four-year, baccalaureate Hispanic-serving institution, was founded in 1982 to change lives and communities by providing quality education to people who—for reasons of location, poverty, or cultural background—have been denied educational opportunities. Heritage University currently enrolls 871 undergraduates, 55 percent of whom are Hispanics and 11 percent are Native Americans. Through dual enrollment articulation agreements, 120 or 14 percent of the 871 undergraduates take Heritage University baccalaureate programs on their own community college campuses.

The HSI STEM & Articulation Project activity is titled, “*Improving Science, Technology, Engineering, and Mathematic (STEM) Access and Student Success of Hispanic, Low Income, Rural Students.*”

Heritage University proposes an Articulation Program project which joins HU, to three public community colleges (Yakima Valley Community College in Yakima, Columbia Basin College in Pasco and Big Bend Community College in Moses Lake). All of these institutions are located in rural Eastern Washington State. The combined service areas of these institutions consist of the largest and most rapidly growing Hispanic population in the state. In contrast to the combined service area growth, the income and educational attainment of the area are the lowest in the State. Over a third of the Hispanic residents live in poverty and less than 15 percent have college degrees. In analyzing this data, HU concluded that mastery of the math and science competencies required for college-level work and for STEM careers necessitates strengthening Hispanic and low income students’ math and science competencies all along the 9 to 12 educational pipeline.

To achieve this goal, HU proposes a collaborative project designed to increase STEM access and student success at all four institutions. The project consists of six major components: (1) three two-week collaborative summer institutes on integrating math and science content and pedagogy in co-developed courses; (2) co-teaching the math and science developed course in three regional high schools; (3) Web-based videos of the co-developed courses and student services information; (4) STEM advising career planning and placement improvements; (5) summer research projects for HU and regional community college students to expose them to STEM work and professionals; and (6) mentoring/tutoring of at risk of failing students. The components center on increasing Heritage University’s undergraduate enrollment by 20 percent, the retention rate by 12 percent, and the six-year graduation rates of first time, full time students by 12 percent, thereby nearly doubling the number of students enrolled by 2016.

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