

2015 Minority Serving Institutions Program

University	Amount	Title
California State Dominguez Hills	\$200,000.00	Probabilistic Risk Assessment of Robots Used In Nuclear Safety Applications
College of Menominee	\$179,158.36	Transforming the Fundamental Academic Framework to Support College-Ready Students
Fort Valley State University	\$327,952.69	Pre-College Pipeline: Mathematics, Science, and Engineering Academies for Students from Under- Represented Minorities and Females
Morgan State University	\$145,704.00	Power Plant Environmental Training Center: Predicting Environmental Induced Outages at Nuclear Power Plants
Nebraska Indian Community	\$226,388.95	Nebraska Indian Community College's Enhancement and Persistence into STEM program
Orangeburg Calhoun Technical College	\$230,879.00	Establish a Radiation Protection Technician (RPT) Institute
Polytechnic University of Puerto Rico	\$133,184.00	NRC 2014: Scholarships and Fellowships to Increase Undergraduate and Graduate Research and Education in NRC Related Areas in Puerto Rico
South Carolina State	\$99,974.00	2014-2015 Scholarship Program in Nuclear Engineering, Radiochemistry and Health Physics
Texas College	\$124,400.00	Harvesting Nuclear Scientists: The Texas College Scholars Program
University of Nevada, Las Vegas	\$133,333.00	Nuclear Engineering Fellowship Program at UNLV
University of Houston Downtown	\$280,000.00	Preparing Minorities for Nuclear-related Jobs through Research & Certification
University of Texas, El Paso	\$100,000.00	Increasing the Participation of Underrepresented Minorities in Training and Research at National Laboratories: a University of Texas at El Paso - Los Alamos National Laboratory Initiative
University of Texas, Permian Basin	\$169,506.00	Integrated Research and Education Developmental Activities for the Mechanical Engineering-Nuclear Track Students and Faculty at UTPB

California State University Dominguez Hills

Project Title: Probabilistic Risk Assessment of Robots Used In Nuclear Safety Applications

Principal Investigator: Dr. Antonia Boadi, Ph.D., aboadi@csudh.edu

Total Funding Requested: \$499,334 over 5 years

Executive Summary:

California State University, Dominguez Hills (CSUDH) supports the Nuclear Regulatory Commission's mission by developing the knowledge and skillsets of its students relevant to nuclear safety and security. The goal is to train students to integrate Probabilistic Risk Assessment (PRA) into the design of robots used in nuclear safety applications.

The use of robots, both autonomous and remotely-operated units, has broad application in the nuclear power industry. Highly specialized robots can perform maintenance and inspection tasks within nuclear plants where high radiation levels, humidity or heat create conditions that are unsafe for human workers. Concomitant with the use of robots in the nuclear energy domain is the potential for accidents, the inadvertent creation of hazards, and the possibility of low-probability, high consequence events.

College of Menominee Nations

Project Title: Transforming the Fundamental Academic Framework to Support College-Ready Students

Principal Investigator (PI): Jennifer Morris, jmorris@menominee.edu

Total Funding Request: \$399,959 for three years

Executive Summary:

This College of Menominee Nation project focuses on transforming the fundamental academic framework to support both college-ready students and students who are not yet college ready. This will result in a comprehensive consolidated effort to ensure students have a cohesive and coherent support system as they move through CMN from assessment and placement through gateway course and emphasis course completion. Of particular note is the attention paid to high impact completion practices. The transformation will ultimately increase the recruitment of students into STEM programs, and their persistence through those programs.

The overall goal of this project is to expand the pool of college-ready and nearly college-ready students who enter the STEM pipeline, remain on track, and matriculate to advanced studies in STEM fields either at CMN or with our partner institutions. Through improved assessment, counseling, and placement, CMN will increase STEM degree-seeking student enrollment by 30%. STEM students will experience higher success rates (grade of "C" or higher) in gateway courses and improvement in first term GPAs. Course success will lead to a higher percentage of STEM students who maintain good standing and who are retained through their third term. This academic preparation, informed by Tribal cultural values, will enable these students to contribute to advancing the Nuclear Regulatory Commission's mission of nuclear safety, security, and environmental protection.

Fort Valley State University

Project Title: Pre-College Pipeline: Mathematics, Science, and Engineering Academies for Students from Under- Represented Minorities and Females

Principal Investigator: Dr. Isaac J. Crumbly, Ph.D., Crumblyi@fvsu.edu

Total Funding Requested: \$803,632 over 3 years

Executive Summary:

The Mathematics, Science, and Engineering Academy (M-SEA) is a twenty-one year old pre-college STEM outreach program for underrepresented minorities and female students and is operated by the Fort Valley State University's Cooperative Developmental Energy Program (CDEP). M-SEA consists of four summer academies, 9th, 10th, 11th, and 12th grade academies. The 9th and 12th grade academies are two weeks in duration while the 10th and 11th grade academies are one week in duration. A total of 100 students participate each summer.

M-SEA students enter the program during the summer as rising 9th graders and are selected on the basis of their academic performance and state standardized test scores. Students take a pre-test at the beginning of the 9th, 10th, and 11th grade academies and a post test at end of each academy. Each student must score a minimum of 80% on their M-SEA posttest as one of the criteria for continued participation. Additionally, during the academic school year, students cannot make a semester grade less than a B in any science or math class and must maintain an overall gpa of 3.0 or above.

The 9th and 12th grade academies are held on the campus of Fort Valley State University and 10th and 11th grade M-SEA academies are held on the campuses of the University of Nevada at Las Vegas and the University of Arkansas, respectively. Students in the 9th grade academy also visit the campuses of Penn State University and Georgia Institute of Technology. When the M-SEA students complete 12th grade, they will be eligible to enroll into CDEP's dual degree programs in engineering, geology, geophysics and health physics between Fort Valley State University and its partnering universities. During its four-year duration, the project will mentor a total of 175 students.

Morgan State University

Project Title: Power Plant Environmental Training Center: Predicting Environmental Induced Outages at Nuclear Power Plants

Principal Investigator: Dr. Mark Bundy, Ph.D., Mark.Bundy@Morgan.edu

Total Funding Requested: \$467,114 over 3 years

Executive Summary:

Operations personnel at nuclear power plants are continually adjusting their operations to account for changing external environmental conditions. If this variability can be predicted then the operations of the plant may be adjusted to avert any significant impact to operations. These environmental state changes, which are a product of cyclic seasonal patterns, ecological processes, large weather events or more often a combination of factors, can reduce efficiencies, impact compliance and increase costs. On the environmental side we may see significant changes in dissolved oxygen, temperature, salinity or other factors critical to supporting local aquatic fauna and flora. Some of the impacts we see are massive fish kills or unexpected growth of undesired species that can impact normal plant operations. On the operational side, we can see a reduction in operation efficiency, damage to plant equipment or even an unplanned stoppage in electricity production all of which are additional costs to the plant's operations. Fortunately, some of these environmental impacts can be predicted and mitigated if someone is trained in looking for the triggers to these environmental events.

Morgan State University proposes to create the Power Plant Environmental Training Center. Individuals with training in aquatic systems and nuclear plant operations expertise will staff the Center. These individuals will develop a general environmental systems training program for power plant staff and also work with individual nuclear power plants. They will provide the training to help plant operators understand the basics of aquatic ecosystem dynamics. This training will better enable them to predict certain kinds of biological events from the environmental data routinely collected. On a case-by-case basis, the staff from the Center will go to individual nuclear power plants to help identify the causes and find solutions of the plant's unique problems.

Nebraska Indian Community College

Project Title: Nebraska Indian Community College's Enhancement and Persistence into STEM program

Principal Investigator: Hank Miller, hmliller@thenicc.edu

Collaborator: Dr. Michael Oltrogge, President; Nebraska Indian Community College; PO Box 428; Macy NE 68039; moltrogge@thenicc.edu – (402) 960-5176

Total Funding Requested: \$399,842 over 5 years

Executive Summary:

The goal of the NICC's Enhancement and Persistence into STEM fields is to 1) increase the number of students who take STEM related courses; 2) increase the number of students who persist to course completion; and 3) to increase the number STEM courses available. The benefit will be increased STEM capacity at NICC and increased student, both college and high school enrollment on the Santee Sioux and Omaha Reservations.

Orangeburg Calhoun Technical College

Project Title: Establish a Radiation Protection Technician (RPT) Institute

Principal Investigator: Kara N. Beharry, M.Sc, beharrykn@octech.edu

Total Funding Requested: \$233,526 over 3 years

Executive Summary:

The goal of this project is to establish a Radiation Protection Technician (RPT) Institute at Orangeburg–Calhoun Technical College (OCtech). This Institute would enhance opportunities for students at OCtech to be successful in the RPT program and to become productive employees in the field of radiation protection. This project will help fill expected vacancies in the workforce.

- One component of the Institute will be a *Summer Bridge Program* with an aggressive recruiting effort to increase the number of students enrolling in the RPT program and to improve the retention and success rates of entering students. The desired metric would be to increase the number of enrollees in the program by 10 students each year. (30 additional students over the course of the program)
- The second component of the Institute will be to expand, in collaboration with our business and industry partners, opportunities for students to participate in project-supported internships during the course of their training at OCtech. The desired metric would be to offer on a competitive basis 6 internships each summer. (18 internships for students over the course of the program)

Polytechnic University of Puerto Rico

Project Title: NRC 2014: Scholarships and Fellowships to Increase Undergraduate and Graduate Research and Education in NRC Related Areas in Puerto Rico

Principal Investigator: Dr. Alfredo Cruz, Ph.D., alcruz@pupr.edu

Total Funding Requested: \$399,554 over 3 years

Executive Summary:

The goal of this project is to support seven students over a period of three years to increase research and education in nuclear science and engineering related areas at the graduate and undergraduate levels. The activities will contribute to the development of minority students in nuclear engineering and related areas such as: network and system security, nuclear safety, nuclear forensics, smart antennas, cryptography, computer forensics, and environmental protection among other related nuclear topics. This project will help PUPR continue the efforts to substantially increase the number of women and minorities prepared for careers in nuclear science and engineering related areas such as Electrical Engineering, Computer Engineering, and Computer Science; and will help to alleviate the nationwide shortage of qualified professionals in these areas.

South Carolina A&T University

Project Title: 2014-2015 Scholarship Program in Nuclear Engineering, Radiochemistry and Health Physics

Principal Investigator: Dr. Kenneth D. Lewis, Ph.D., P.E., klewis31@scsu.edu

Total Funding Requested: \$99,974 over 1 Year

Executive Summary:

The goal of this grant will be to provide tuition and book scholarship support in varying, need-based amounts ranging from \$1000 to \$10,000 to high potential undergraduate students majoring in Nuclear Engineering, Radiochemistry and Health Physics for one academic year. It is anticipated that, with leveraging of state, federal Pell grants, and other external scholarships, six (6) or more students will receive full or partial support each year from this USNRC funding. Priority will be given to junior and senior students who have maintained at least a 3.0/4.0 grade average. Only U.S. citizens will be eligible. Additionally, 10-15 new high performance computers will also be purchased to replace six year old machines that cannot adequately run modern nuclear engineering computer programs.

Texas College

Project Title: Harvesting Nuclear Scientists: The Texas College Scholars Program

Principal Investigator: Dr. Dwight Fennell, Ph.D., dfennell@texascollege.edu

Total Funding Requested: \$440,000 over 4 years

Executive Summary:

The goal of this grant is to support the work of the USNRC by introducing the STEM Scholars Program. This institutional grant will provide partial scholarships for books, tuition, travel, and housing to a cohort of 10 STEM Scholars who will also be provided the academic and non-academic supports needed for outstanding performance including employment at USNRC, collaborative learning, career services, mentoring, reading, comprehension and writing skills, electronic tutorials, on-campus research, case management, and other services.

University of Nevada, Las Vegas

Project Title: Nuclear Engineering Fellowship Program at UNLV

Principal Investigator: Prof. Alexander Barzilov, Alexander.Barzilov@unlv.edu

Total Funding Requested: \$400,000 over 3 years

Executive Summary:

The goal of this grant is to address the human capital challenge and to engage groups that are underrepresented in the nuclear engineering professional community. UNLV plans to establish the Nuclear Engineering Fellowship Program at the University of Nevada, Las Vegas which will consist of selecting and awarding five Ph.D. Fellowships per year at UNLV during four years. The UNLV is in a unique position of the Minority Serving Institution that has the sustainable and active graduate program in Nuclear Engineering. The program leads to a M.S. degree in Nuclear Engineering and Ph.D. degree in Engineering (Nuclear Engineering option).

University of Houston Downtown

Project Title: Preparing Minorities for Nuclear-related Jobs through Research & Certification

Principal Investigator: Dr. Mary Jo Parker, Ed.D.,

Total Funding Requested: \$850,000 over 5 years

Executive Summary:

The goal of this project is to widen the current UHD pipeline into nuclear-related science graduate programs and workforce employment. This project's objectives are to: 1) provide minority undergraduate scholarships to complete a science, technology, engineering, and mathematics (STEM) baccalaureate degree, 2) provide extensive exposure to nuclear related graduate and workforce program through field trip/seminar exposure; 3) support completion of the five-course Nuclear Power Institute (NPI) certificate program qualifying graduates to enter nuclear power plant jobs and nuclear engineering studies, 4) provide a dedicated health physics program of study qualifying students for radiation safety/health physics positions, and 5) provide mentored nuclear-related research experiences in radiochemistry, control and instrumentation, math, physics/material science, & computational radiochemistry.

University of Texas, El Paso

Project Title: Increasing the Participation of Underrepresented Minorities in Training and Research at National Laboratories: a University of Texas at El Paso - Los Alamos National Laboratory Initiative

Principal Investigator: Dr. Chintalapalle V. Ramana, rvchintalapalle@utep.edu

Total Funding Requested: \$448,660 over 5 years

Executive Summary:

The main theme of the project is focused toward developing a fundamental and mechanistic understanding of the performance and degradation of materials used in the construction of nuclear reactors. UTEP has extensive laboratory and field characterization facilities relevant to the topic. This project will contribute to the development of scientific knowledge of the advanced, nonintrusive methods of testing and evaluation of structures and alloys for application in nuclear reactors. The specific project objectives are to: (1) promote research and education related to the topic at UTEP, (2) increase the number of students from underrepresented groups, (3) improve the capacity through faculty development, and (4) foster collaborations with national laboratories and top-ranked universities and industry.

The work plan is designed to ensure that by the end of this project, UTEP will be able to partake in competitive research and education related to the topic with well-crossed trained faculty and research staff. The PI's of the project have strong records of collaborative research in macro- and micro-level characterization of materials. To ensure that the end results of this project are rigorous and relevant, a group of outstanding researchers from major research institutions and industry are included as mentors and partners.

University of Texas Permian Basin

Project Title: Integrated Research and Education Developmental Activities for the Mechanical Engineering-Nuclear Track Students and Faculty at UTPB, Program B

Principal Investigator: Dr. Essam Ibrahim, ibrahim_e@utpb.edu

Total Funding Requested: \$169,508 over 3 years

Executive Summary:

The mechanical engineering department at UTPB offers an ABET accredited B.S. degree in mechanical engineering with general or nuclear track options. There are currently about 150 undergraduate students majoring in mechanical engineering. Approximately 50% of the undergraduate students in the department are enrolled in the nuclear-track option and over 40% of the undergraduate mechanical engineering students are Hispanic Americans. The department is continually active in recruiting minority and female students for its B.S. degree.

The present project proposes to combine research and educational endeavors to better attract, retain, and prepare mechanical engineering nuclear-track students and faculty at UTPB. The integrated developmental activities will foster the students and faculty competitiveness in research and boost their dedication to the learning process.