

2008 TexPREP Student Participation			
TexPREP Site		Started	Graduated
Alpine		6	5
Arlington	TCCSE	61	35
	UTA	37	31
Austin		43	35
Brownsville		95	71
Corpus Christi		75	65
Dallas	Cedar Valley	6	6
	Eastfield	21	21
	El Centro	47	40
	Mt. View	59	44
	Richland	23	22
S. Methodist		15	14
Edinburg		183	165
Ft. Worth	TCCS	77	70
	Texas Wesleyan	103	98
Harlingen		149	115
Houston		250	232
Laredo		274	181
Lubbock		110	100
San Antonio		1340	1177
Victoria		19	16
<b>TOTAL</b>		<b>2993</b>	<b>*2543</b>
*50% Women / 82% Minority			

## PROGRAM RESULTS

### Follow-Up Survey Results (1979-2008)

Since 1979, 28,361 middle school and high school students have successfully completed at least one summer component of TexPREP. Of these students, 81% have been members of minority groups, 53% have been women, and 38% have come from economically disadvantaged families. Of the 13,066 who are of college age 5,854 responded to the 2008 annual survey. The results of this survey are as follows:

-99.9% are high school graduates.

-99% are college students (2,822) or senior college graduates (2,945).

-84% of the college attendees are college graduates.

-74% of the senior college graduates are members of underrepresented minority groups.

-45% of the senior college graduates are engineering, mathematics, science or computer science majors.

-69% of the engineering, science, computer science and mathematics senior college graduates are members of underrepresented minority groups.

-93% of the current college students (2,778), junior college graduates (63), and senior graduates (2,559), attended or graduated from Texas colleges.

## 2008 TexPREP SITES

### Alpine (2008)

Sul Ross University

### Arlington (1995)

Tarrant County College Southeast Campus  
University of Texas at Arlington

### Austin (1990)

Huston-Tillotson University

### Brownsville (1986)

University of Texas at Brownsville

### Corpus Christi (1987)

Del Mar College

### Dallas

Cedar Valley (2008)  
Eastfield College (2008)  
El Centro College (2006)  
Mountain View College (2008)  
Richland College (2007)  
Southern Methodist University (2008)

### Edinburg (1986)

University of Texas-Pan American

### El Paso (1989)

University of Texas at El Paso

### Fort Worth

Tarrant County College South Campus (2008)  
Texas Wesleyan University (1998)

### Harlingen (1997)

Texas State Technical College

### Houston (1989)

University of Houston-Downtown

### Laredo (1986)

Texas A&M International University

### Lubbock (1986)

Texas Tech University

### San Antonio (1979)

Northwest Vista College  
Palo Alto College  
St. Philip's College (SPC)  
SPC-Southwest Campus  
San Antonio College  
University of the Incarnate Word (UIW)  
UIW Dual Enrollment Center  
St. Mary's University  
The University of Texas at San Antonio (1604 & Downtown)

### Victoria (2007)

The Victoria College

For additional information:

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### The University of Texas at San Antonio

Prefreshman Engineering Program  
501 W. Durango Blvd.  
San Antonio, Texas 78207-4415

## FINANCIAL REPORT

### PROGRAM COST SUMMARY

- Personnel
- Fringe Benefits
- Maintenance & Operation
- Travel (Staff)
- Participant Support
- Classroom and Laboratory Facilities
- Other

### FINANCIAL & IN-KIND SUPPORT

- Financial Contributions
- In-kind Contributions



**TOTAL BUDGET ESTIMATE: \$2,567,550**

# 2008 Annual Report

# UTSA

Administered by  
The University of Texas at San Antonio



## Message from the Executive Director

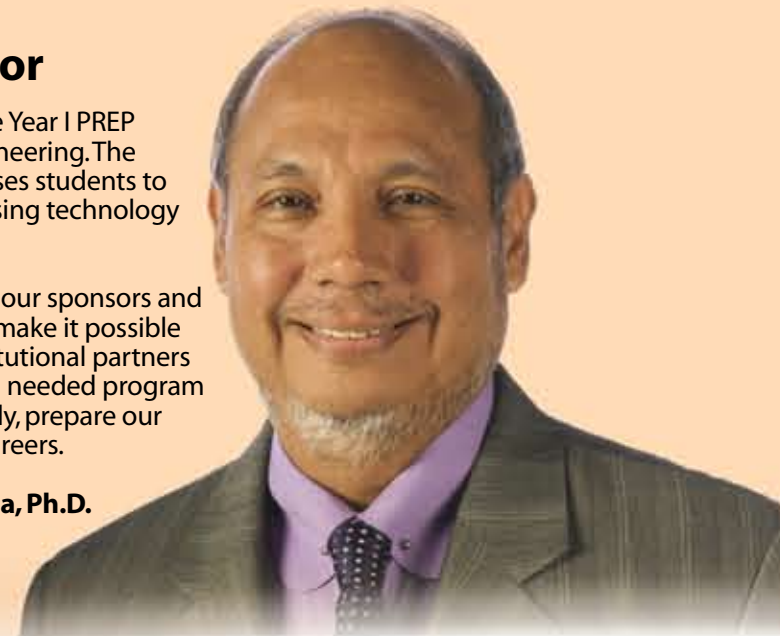
The Texas Prefreshman Engineering Program (TexPREP) continues to grow and impact the lives of many students statewide by enhancing their academic skills through advanced coursework in the STEM (science, technology, engineering, and mathematics) areas. In addition to directly supporting the state's Closing the Gaps initiative, TexPREP's rigorous curriculum focuses on key areas associated with the Texas Industry Cluster Initiative.

In 2008, TexPREP added seven new sites across the state and increased the number of students who attended. And with the help of the Greater Texas Foundation, TexPREP was able to add a component of the

Infinity Project to the Year I PREP Introduction to Engineering. The Infinity Project exposes students to digital signal processing technology via sound.

I would like to thank our sponsors and benefactors as they make it possible for our TexPREP institutional partners to provide this much needed program and more importantly, prepare our students for STEM careers.

**Raul (Rudy) A. Reyna, Ph.D.**  
Executive Director



## MISSION AND VISION

The mission of the Texas Prefreshman Engineering Program (TexPREP) is to provide a challenging academic program designed to motivate and prepare middle and high school students for success in advanced studies leading to careers in STEM. PREP is a national program with an emphasis on increasing the number of women and minorities in STEM fields.

The vision of the Prefreshman Engineering Program (PREP) is to be the K-12 extended education program of choice for successfully preparing students for careers in STEM fields through innovative educational and technology-enabled approaches that empower students to become lifelong learners, problem solvers and decision makers.

## PURPOSE AND GOALS

TexPREP is an academically intense, mathematics-based summer program, which stresses the development of abstract reasoning and problem solving skills.

The purpose of the program is to identify achieving middle and high school students with an interest in science, technology, engineering and other mathematics-related areas and to increase their potential for careers in these fields.

The goals of the program are to increase the number of competently prepared students from Texas who will ultimately pursue engineering, science, technology, and mathematics studies in college and to increase the retention rate of these students as they progress through college by:

- acquainting these students with professional opportunities in engineering;
- reinforcing the academic

preparation of these students at the secondary school level; and

- creating an environment in which talented students are encouraged to learn, explore, achieve, and discover.

### HISTORY

The Prefreshman Engineering Program was founded in 1979 by mathematics professor, Dr. Manuel P. Berriozábal, at the University of Texas at San Antonio. Replication of San Antonio PREP began in 1986 with sites throughout the state of Texas (TexPREP). Since 1997, with a grant award from NASA, PREP continued its replication in Hispanic-serving institutions nationwide.

### ACADEMIC PROGRAM

The mathematics-based program, approximately seven weeks in length, is presented over the course of four summers to students entering grades seven to eleven. The Texas Education Agency has authorized participating school districts in the state of Texas to

award one elective credit toward high school graduation for each successfully completed summer of TexPREP. The curriculum is outlined below.

#### First Year

Logic and Its Applications to Mathematics  
Introduction to Engineering

#### Second Year

Algebraic Structures  
Introduction to Physics

#### Third Year

Introduction to Technical Writing  
Introduction to Probability and Statistics

#### Fourth Year

Introduction to Water Science  
Computer Science

#### All Years

Topics in Problem Solving  
Career Awareness Seminars  
Field Trips

## HIGHLIGHTS

### ALPINE

A sound demonstration provided by Washtub Jerry, a local entertainer who builds and plays a washtub bass instrument with the ukulele, was the highlight of the Infinity engineering project. Washtub, also an engineer with the McDonald Observatory in Fort Davis, played various notes as the students viewed the notes' sound waves demonstrated on the Infinity software.

### ARLINGTON

- Tarrant County College Southeast Campus  
This was the first year that the campus participated in TexPREP. Student projects included building and flying kites and planes, as well as an egg drop activity.

- University of Texas at Arlington  
Under the supervision of staff, PREP students increased the memory of the computers in the computer lab. Students unlocked the main chassis and cover of each machine, exposing the boards and circuits, and completed the upgrade with proper installation and testing.

### AUSTIN

A variety of green technologies were demonstrated to the students including electric and hybrid vehicles, wind turbine technology, solar energy and fuel cells. Field trips to the Dell Children's Medical Center, Houston Museum of Natural Science, Houston Space Center, and Natural Bridge Caverns and Wildlife Ranch were arranged for students.

### BROWNSVILLE

Special projects included the Robotics Applications class where the students learned about the principles of robotics, and the Physics Circus, a physics demonstration of Newton's laws, provided by a representative of the UTB Physics and Astronomy Department.

### CORPUS CHRISTI

PREP students toured environmental, mechanical, civil, and electrical engineering labs at Texas A&M University-Kingsville (TAMUK) and participated in demonstrations by TAMUK graduate students and professors. Local media were invited to meet the students and view the rocket and robot competitions on Media Day.

### DALLAS

- Cedar Valley College  
Students were inspired by career speakers in fields of robotics, biology, chemistry, medicine, environmental sciences, and engineering. Field trips to a zero energy home, waste water treatment plant, and technology product developer broadened the students' awareness of career opportunities.

### - Eastfield College

Field trips for students included the Texas Instruments Wafer Lab, Dallas Science and Nature Museum, and the Ft. Worth Museum of Science and History. While visiting the Frontier of Flight Museum, students participated in an aerodynamics class where they made their own airplane gliders.

### - El Centro College

The dynamics of engineering was presented to PREP students by a TxDOT engineer. She also demonstrated how to build and design a bridge using basic systems and engineering techniques. PREP students built and designed a bridge using candy and pretzels.

### - Richland College

Students appreciated the Friday field trips to the Frontier of Flight Museum, Texas Instrument Digital Light Processing Lab, Dallas Museum of Nature and Science, Zero Energy Home, Green WalMart, Dallas World Aquarium, and on the final day, Celebration Station.

- Southern Methodist University  
In addition to classroom instruction, students in the Year II and III programs were able to tour the engineering research and development facility and automated production line at the Peterbilt Corporation. Graduates of Year II received a \$1,000 scholarship to the School of Engineering at SMU.

### EDINBURG

With a focus on engineering applications and hands-on learning, weekly design projects (catapults, bridges, rockets) gave students an opportunity to build teamwork skills and enthusiasm for engineering. Second year students participated in a one week residential program (PREP-Plus+) taking an intensive vehicle dynamics course.

### FORT WORTH

- Tarrant County College South Campus  
Students visited the Burlington Northern Santa Fe (BNSF) Railway command room where BNSF engineers

control trains throughout the country. Major projects included bottle rockets and building and operating a hovercraft, both of which were televised on three Dallas/Fort Worth news channels.

- Texas Wesleyan University  
A special emphasis this year was "Protecting Our Environment" with speakers presenting topics that included industry and environmental protection, utilization of wind turbines to generate electrical power, mass transportation and the environment, and proactive preservation of the local water supply.

### HARLINGEN

During the summer program, students in the engineering class built and demonstrated bottle rockets, as well as Gosney speakers in the Infinity Project component of the course.

### HOUSTON

Houston PREP celebrated its 20th anniversary with a celebration where past and current sponsors, faculty, program coordinators, and alumni were recognized. Dr. Max Castillo, president of the University of Houston Downtown Campus, was the keynote speaker and PREP alumni gave testimonials at the event.

### LAREDO

Laredo PREP students were treated to an overnight field trip to Corpus Christi to tour the vintage aircraft carrier, USS Lexington, and learned about marine biology at the Texas State Aquarium.

### LUBBOCK

PREP III and IV students visited Paragon Innovations, an engineering firm in Plano. A former PREP student who attended PREP in the early 1990s and now works in crime scene investigations in Oklahoma was a guest speaker for the students.

### SAN ANTONIO

San Antonio PREP celebrated its 30th summer of the program with a newly developed fourth year of PREP which included courses in computer science, water science, and a systems problem solving component.

### VICTORIA

Victoria PREP students toured both NASA and the Aransas Pass Wildlife Refuge, and were given an excellent opportunity to work in the college's Process Technology Lab.

## TexPREP's IMPACT

"TexPREP is one of the things that I will never forget in my life. It has brought [me] a lot of memories and faithful friends. Thank you for making possible all these incredible moments. TexPREP, a program that puts people together no matter where they are from, should continue for a very long time. Not only does it help us academically, but also to know people from other places."

- Laredo PREP student

"I feel compelled to say 'Thank You' very much for giving Morgan the opportunity to attend your program. I also wanted you to know that Morgan



Science Club. He stated that the Science Club deals with "physics" and this would prepare him for his physics course at Houston PREP next year! You can't imagine how proud I am."

- Houston PREP parent

decided that he wasn't going to play football for his middle school this year; instead he's joining the

"Houston PREP was an amazing experience! I had the best four summers spending it there at University of Houston Downtown. Houston PREP really helped me out in my class work. When the following school year began, I always was either ahead of the class or knew what the teacher was talking about. The classes at PREP really helped me appreciate all the work engineers and scientists do. Plus aside from all this work I was able to meet people from the Houston area and we really got close and became the best of friends. PREP is a wonderful program that all students should do!"

- Houston PREP IV student



## AWARDS

TexPREP has received numerous state and national awards and citations as a model program. They include:

- Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring (San Antonio PREP, 1997)
- Citation, 1999 U.S. Department of Education White House Initiative on Educational Excellence for Hispanic Americans publication What Works for Latino Youth (1999)
- Citation, Texas Governor's Special Commission on 21st Century Colleges and Universities; Higher Education in the 21st Century – Moving Every Texan Forward (2001)



- Quality Education for Minorities Network, Exemplary MSE Education Partnership Award (2001)
- Texas Higher Education Star Award (2002)
- Citation, Congressional blue ribbon panel, What It Takes: PreK-12 Design Principles to Broaden Participation in Science, Technology, Engineering and Mathematics for the Building Engineering and Science Talent (BEST) Project (2004)

American Society of Mechanical Engineers (ASME), recognition as one of

the Premier Pre-College Programs helping teachers and engineers to strengthen the STEM skills of young people (San Antonio PREP, 2005)

- Best Practices in K-12 Science Education Compendium, Bayer Corporation (2006, 2008)

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