Texas State University
2012-2017 University Goals and Initiatives
College of Science and Engineering 2012-2013 Plan Progress

Goal 1: Promote academic quality by building and supporting a distinguished faculty.

1.1 Increase average full-time faculty salaries at all ranks.

1.2 Increase number of full-time faculty.

1.3 Attract and retain highly competent faculty by providing annual merit increases based on performance.

1.4 Provide a university infrastructure (including equipment and facilities) to support teaching, research, and scholarly and creative activity.

(Biology) During the time period, the Department of Biology has established instrumentation for quantitative analyses in cell and molecular biology and in quantitative ecology, and initiated the setup of hard- and software to extend initiatives in bioinformatics.

(MSEC) The Analysis Research Service Center has been expanded and provided support to over 100 faculty, staff and students in this reporting period.
(MSEC) Micropower Global commited $266,180 to upgrade to a new chamber for PbTe growth on the MBE system backbonne.
(MSEC) Cerium Laboratories committed $50,000 to match 50% of the cost to upgrad the FEI Helios Nanolab SEM
(MSEC) The Microfabrication Facility in the cleanroom has been equipped with an e-beam evaporator for metals deposition ($280,000)

(CS) CS spent more than $70,000 on servers to support teaching and research in CS.

(ENG TECH) A new spectrometer was acquired for the Materials Testing lab in support of the foundry and manufacturing programs. This new instrument will be used for both teaching and research. RFM 1220B was renovated to provide Dr. Laura Bartlett with a state of the art research lab in

support of the foundry and metallurgy program.

1.5 Offer academic programs that are nationally and internationally competitive.

(BIOLOGY) The PhD program in Aquatic Resources is consistently attracting international students, with graduates being competitive for both national and international positions. MS students in Aquatic Resources and Wildlife are acknowledged and well received at respective State Agencies.

(MSEC) The MSEC PhD is a unique program nationally with principal objectives to train PhD students in materials science and engineering providing them with complementary business and entrepreneurial skills set and to produce scientists and technologists who will be industrial leaders in leading both startup and established high-technology companies within the state of Texas and nationally.

(CS) CS started working on a new PhD in CS program proposal.

(Math)

Texas Mathworks
- A team of four middle school students representing the Mathworks center at Texas State University and the city of San Marcos has won the 2013 Primary Math World Contest (PMWC), held in Hong Kong, July 13-19. The PMWC is hosted by Po Leung Kuk, a regional charitable foundation. This is the first Texas team to win the competition outright--the 2008 team tied for first place. In addition, the four students achieved first place in the team portion of the contest, as well as receiving the Po Leung Kuk Cup for being the top non-Asian team. The team was accompanied by Nate Dean, chair of the mathematics department at Texas State, and Monica Martin, a math teacher at Miller Middle School in San Marcos.

The Mathworks curriculum is available. The Math Explorations curriculum was authored by Texas State math professors Max Warshauer, Hiroko Warshauer, Terry McCabe and Alex White as part of a curriculum research and development program conducted by the Mathworks center. They took the proven Mathworks Junior Summer Math Camp (JSMC) materials and extended them to cover a full school year curriculum, aligned to the Texas Essential Knowledge and Skills (TEKS) math standards. Though the materials in the JSMC program were being mastered by 4th and 5th grade students, the content matched up to the state's 7th grade standards. Research related to and development of the curriculum was supported through grants from the RGK, Meadows, Sid W. Richardson and KDK-Harman Foundations. The KLE Foundation has also established an

endowment at Texas State, whose earnings will support districts wishing to implement this new curriculum.

Center for Mathematics Readiness
The CMC provides a framework for faculty and staff engaged in developmental mathematics and adult-based mathematics. The Center maintained several projects including FOCUS, Mix It Up, College and Career Readiness Initiatives, and Complete College America. These programs altogether facilitate research, educate underrepresented mathematics students, provide training for the educators, and provide developmental mathematics services to the community.

(CHEM) A program review has been completed in 2013 and attests to national and international recognition of the department's programs.

1.6 Strengthen research and scholarly/creative activity efforts through achieving increases in grant expenditures and increasing collaboration across disciplines.

(Biology) Total grant expenditures have increased by about 10% from $2,808,208 to $3,153,306 in this period.

(Physics) Department of Physics Assistant Professor Nikoleta Theodoropoulou has been awarded the National Science Foundation's CAREER Award for her work as a researcher, teacher and scholar. ($500,000).

(Math) Drs. Jiang, Mireles, Shen and Warshauer had grants that continued from the previous year. Several faculty members have received incentive pay for externally funded sponsored programs, for example, Jiang, Keller, Shen and Mireles.

(ENG TECH)Dr. Soon-Jae Lee received a grant from the Korea Institute of Construction Technology (KICT) in February 2013 in the amount of $19,355. This project was completed in November 2013. Dr. Lee received a grant from the Federal Aviation Administration (FAA) in August 2013 in the amount of $60,000.

During the year past, our Concrete Industry Management (CIM) and Construction Science and Management (CSM) faculty have completed three Texas Department of Transportation (TxDOT) projects totaling $281,318. There is one on-going project comprising an additional $389,684 to be completed in August 2014.

Dr. In-Hyouk Song has received two grants, an NSF MRI grant in the amount of $486,599, and a grant funded by the Korea Atomic Energy

Research Institute (KAERI) in the amount of $149,968.

Dr. Farhad Ameri received a National Science Foundation (NSF) grant entitled "Collaborative Research: Measuring the information contents of design artifacts in early design." This project is a collaboration with a faculty member at Oregon State University. The total funding is $270,031, of which Texas State's share will be $139,456. Dr. Ameri also completed work this year on a grant from the Air Force Reseach Lab (AFRL) in the amopunt of $30,000.

Drs. Kimberly Talley and Gary Winek received a $6K grant from TEXO Education and Research Foundation to fund laboratory stations that will be used to teach concepts in Structural Analysis for all Construction Science and Management Majors.

Dr. Byoung Hee You received a grant from the Korea Textile Machinery Research Institute (KOTMI) in the amount of $25,898. Dr. You also received a grant from KEPCO Plant Service & Engineering in the amount of $44,988. A second phase of this project ihas been funded ror $28,275.

(CHEM) Collaboration across disciplines has increased, expecially with MSEC. The recent NSF-PREM grant has fostered a significant number of collaborations internally and with the Research Triangle participants.

1.7 Provide reasonable start-up funds in order to attract and retain distinguished faculty and to provide the essential equipment to conduct research and attract external grants.

(COSE) Start-up for the University Chair position (Mark Holtz) included $85000 as follows:

$55K from Semiconductor Line Item
$5K from Physics
$5K from Engineering
$5K from Engineering Technology
$15K from College of Science and Engineering

(CS) CS provided funds for teaching release and travel support for the new tenure-track assistant professors hired in the reporting period.

(CHEM) Startup funds have been good.

1.8 Support faculty efforts in international research.

(Biology)TheFdepartment received funds from the Cargill Foundation for research and outreach in Cambodia, as well as an endowment to establish

student exchanges with Cambodia. One lecturer is frequently involved in summer teaching in Cambodia. In addition, collaborations have been established with universities in Malaysia, and research in Ecuador and Switzerland is ongoing.

(CS)C The department provided travel funds to support faculty attending international conferences.

(Math) Faculty members have been supported for travel to China, India, Mexico, and Indonesia.

(ENG TECH) Dr. In-Hyouk Song is completing the second and final year of a Korea Atomic Energy Research Institute (KAERI) grant.

Dr. Byoung Hee You completed a project this year for the Korea Textile Machinery Institute. He also completed phase one of a project for KEPCO Plant Service & Engineering. KEPCO is an electrical power generating company located in the Republic of Korea.

1.9 Maintain Emerging Research University status and pursue the Texas Research Incentive Program (TRIP).

Goal 2: Provide opportunities for a public university education and contribute to economic and cultural development.

2.1 Move forward on the *Closing the Gaps* goals of participation, success, excellence, and research.

2.2 Continue engagement in the economic and cultural development of the region.

(MSEC) Submitted Economic Development Agency Economic Adjustment Grant with Star Park targeting regional economic engagement with entrepreneurial students.
(MSEC and McCoy SOBA) Obtained funding for computers to establish a student entrpreneurial center within STAR Park.

(Math) Math Awareness Month
On April 3, 2013, Mayor Daniel Guerrero of San Marcos met with representatives of the Math Department to proclaim April as Math

Awareness Month and celebrate the importance of mathematics as the foundation of science, art, technology and 21st Century life. This event which occurred in the San Marcos City Hall Council Chambers was part of our annual campaign to reach all sectors of our community.

(ENG TECH) Engineering Technology maintains close ties with a number of professional and industry associations including the Texas Chapter of the American Foundry Society, the Central Texas and San Antonio Chapters of the American Concrete Institute, the Associated General Contractors of Texas, the Associated Builders and Contractors of Texas, the National Association of Home Builders and the Hill Country and Houston Chapters of the Texas Builders Association, and the Central Texas Chapter of the Society of Manufacturing Engineers. Each of these professional and industry associations have many individual and corporate members, and a significant number of these individuals and their affiliate companies participate with the department on several Industrial Advisory Boards representing the construction, concrete, foundry, and manufacturing industries.

(CHEM) Faculty continue to be active in local outreach

2.3 Increase student scholarships and graduate student financial support in an effort to improve recruitment and retention of high achieving students.

(CHEM) No progress within the department regarding needed funding. The faculty are active in promoting eligible students for additional support.

2.4 Internationalize the curriculum.

(CHEM) n/a

2.5 Support faculty and students in pursuing global academic experiences, e.g. study abroad, internships, field placement, research, service learning.

(ENG) Internships for Engineering students at Texas Instruments, Intel, Freescale, NASA.

2.6 Maintain a vigorous, targeted recruitment and marketing campaign.

2.7 Recognize the role of moving to the FBS in developing the image of the university and enhancing economic and cultural development.

2.8 Enhance and support distance learning and Friday/Saturday course delivery.

Goal 3: Provide a premier student-centered, educational experience that fosters retention and success.

3.1 Increase student retention through collaborative programs across the university.

(Physics) The Physics Learning Assistant Program promotes collaboration among students in introductory courses for physical science and engineering majors and between those students and more advanced undergraduates serving as Learning Assistants thereby increasing retention.

(CS) CS collaborated with Engineering on the computer engineering concentration by sharing course offerings.

(CHEM) The department has effectively used collaborations within COSE to retain and engage students

3.2 Enhance quality and consistency of academic advising services.

(COSE) The College advising office continues to be proactive in planning and administering a student-focused advising service.

(Math) Our main advisors have been Dr. Sharon Gronberg who advises undergraduates, Dr. Greg Paasty who advises Master's degree students, and Dr. Xingde Jia who advises our PhD students. We now have Walter Dorman who takes a more active roll in advising undergraduates in collaboration with the Biology Department. The math department staff continue to be more involved in data collection and organization of student data to assist with the advising.

3.3 Develop an Honors College to better attract and engage high achieving students.

(CS) CS continued to offer an honors section of CS 1428.

3.4 Recognize and support intercollegiate athletics and the arts as vehicles to promote a well-rounded collegiate experience for all students.

3.5 Refine student learning outcomes and appropriate assessment measures within each academic program and general education curriculum to ensure program improvement and provide evidence of student success.

(Physics) The Physics Learning Assistant program has improved student learning outcomes on research-based standard assessments.

(CS) CS sent a faculty member to the ABET assessment workshop for training.

(ENG TECH) Extensive work was done over the past two years on learning outcomes assessment. The program level outcomes appearing on the SACS web site were revised and improved, and the data collection process standardized across all departmental programs and faculty members. Two additional programs were added to the SACS site for the first time in 2012-2013, Concrete Industry Management (CIM) and Construction Science and Management (CSM). The learning outcomes and assessment methods created for these new programs follow the format of those implemented previously in pre-existing academic programs (e.g., Engineering Technology and Industrial Technology).

Data were collected in all department programs and posted to Academic Development and Assessment's web site in May, 2013, along with the annual report of same. The annual report for the CIM program was included in an appendix to the self-study document that was submitted to the National Steering Committee (NSC) for CIM.

In anticipation of accreditation reviews for CSM and CIM, course level outcomes assessment has also undergone extensive revision and improvement. Two years ago, faculty in the CSM program implemented a standardized protocol for executing outcomes assessment in our construction courses, and all courses in that program are being assessed according to this new protocol. Reporting from this method of course-level assessment was used in the recent successful ACCE accreditation site visit. Faculty in the CIM program emulated the course level outcomes protocol established by the construction faculty, and these methods of course level assessment were incorporated into the self-study for the CIM program, in anticipation of the NSC site visit, which occurred in the spring of 2013.

(CHEM) Outcomes and assessments were completely rewritten during 2012-2013 to contain appropriate measures and to match against the current course offerings.

3.6 Refine administrative and educational support, research, and public service outcomes and appropriate assessment measures within identified departments to ensure improvement and provide evidence of success.

3.7 Recognize the importance of academic and administrative program review processes to facilitate program improvement in support of the University mission.

3.8 Foster an environment that cultivates students to become successful, engaged alumni.

(Biology) The department of Biology has initated a newsletter that will be published twice a year. A database of contact information for Biology alumni has been established recently.

(Math) Many of our majors are members of Pi Mu Epsilon and the Math Club and are engaged in various departmental activities such as Pi Day, the Graduate Open House, and our Annuual Awards Ceremony.

Talk Math 2 Me
The Talk Math 2 Me Seminar is a colloquium for students and by students. The seminar was organized by student members of the Pi Mu Epsilon Society at Texas State in September 2012 and is run by a math graduate student. Almost all of the speakers are students, and it has grown to be our largest seminar typically with 2 or 3 speakers per 1-hour period and over 120 people in the audience, larger than all of our oither seminars combined!

(ENG TECH) Numerous guest speakers were brought to campus by our student professional organizations, the American Foundry Society (AFS), the Society of Manufacturing Engineers (SME), the American Soceity of Mechanical Engineers (ASME), the Construction Student Association (CSA), and the American Concrete Institute (ACI). Many of these guest speakers were alumni of departmental programs, and those who were not were usually employers of departmental alumni. The student chapter of AFS hosted 3 guest speakers and conducted 2 plant tours. The SME sponsored five guest speakers and five plant tours. SME also organized and administered the Certified Manufacturing Technologist exam. The 2012-2013 academic year was the inaugural year for the ASME student chapter at Texas State. Membership increased from 18 to 33 members in its first year as a student organization. Several members attended joint

meetings with other organizations when guest speakers were giving presentations and when plant tours were held. The CSA hosted 7 industrial guest speakers and 5 job-site tours. CSA organized OSHA 10-hour training on campus and 30-hour OSHA training off campus with the help of the industry. CSA hosted the "8th Annual CSA Golf Tournament" at Onion Creek Country Club with close to 120 industry personnel and students participating. The student chapter of ACI brought four guest speakers to campus during 2012-2013 and participated in one student/industry social event, one community service project, and three ACI student competitions. The student chapter won the ACI Excellent University Award for the third year in a row. Eight ACI members traveled to the World of Concrete Trade Show in Las Vegas, Nevada, interacting with industry professionals from around the nation.

3.9 Broaden efforts to facilitate successful transition of students to the workplace and graduate/professional education.

(Biology) Graduate students are mentored and successfully prepared for entry level positions by individual advisors with respect to applications and duties.

(MSEC) The MSEC PhD program provides a uniquely trained workforce capable of being the industrial leaders necessary for leading both startup and established high-technology companies within the state of Texas and nationally.

(Physics) Physics faculty Eleanor Close, Hunter Close and David Donnelly were awarded a $350K grant from the Robert Noyce Teacher Scholarship Program specifically to increase the number of students obtaining STEM teacher certification.

(ENG TECH) The Department of Engineering Technology continues to hold three career fairs each academic year. Two of these events focus on the construction and concrete industries. The third event is held in collaboration with the Ingram School of Engineering and emphasizes careers in various other Technology and Engineering disciplines such as Manufacturing, Mechanical, Electrical, and Environmental Engineering Technology and Industrial, Manufacturing, and Electrical Engineering.

Two graduates of our Master of Science in Technology (MST) program were accepted last year into the new Ph.D. program in Material sScience Engineering and Commercialization (MSEC) and both students continue to maintain their good academic standing in that program through their second year.

3.10 Continue faculty and student information literacy initiatives that support achievement of student learning outcomes.

3.11 Implement Personalized Academic and Career Exploration (PACE) to foster retention and success.

Goal 4: Enrich our learning and working environment by attracting and supporting a more diverse faculty, staff, and student body.

4.1 Attract and retain a diverse faculty and staff.

4.2 Remain a Hispanic Serving Institution that emphasizes retention and graduation.

(Biology) Individual faculty in the department are involved as Co-PIs in advising of MS students through a collaborative USDA-HSI project with Agriculture to engage Hispanic MS students in science-based education in Ag. Biology Department.

(Physics) The Physics Learning Assistant Program provides an additional academic community support structure and leadership opportunities for Hispanic STEM students.

4.3 Enhance recruitment, retention, and support programs for all racial, ethnic, and international groups.

(Biology) The collaborative USDA-HSI project with Agriculture was used to specifically recruit Hispanic MS students into science-based education, with financial support for 2 years. Recruiting is also part of participation of the Department in job fairs.

(Math) Our primary planning goal is to become one of the nation's top ten Mathematics Education doctoral programs. Our second goal is to pursue a doctoral program in Mathematics, building on the existing research expertise of the faculty which will strengthen and enhance our doctoral program in Mathematics Education. We continue to develop new courses and hire replacements for retiring faculty to better position ourselves strategically to meet these objectives. This past year we expended much

effort in organizing two coferences with this in mind.
- ISPAN
The International Symposium on Pervasive Systems, Algorithms, and Networks (ISPAN) is a forum for scientists, engineers, and practitioners throughout the world to exchange ideas and research results related to the design, use, analysis, and application of pervasive systems, algorithms, and networks. It was held in San Marcos Dec. 13-15, 2012. Dean Seidman gave the Keynote Address and met with our visitors from around the world and some of our math graduate students at Texas State.
- Undergraduate MATHFest
Although this event took place in November much of the planning occurred during 2012-2013. The Mathematics Department held its annual Graduate Mathematics Open House on Friday November 8th and hosted this event for the National Association of Mathematicians, Inc. (NAM) on November 8-9. Both Dr. Seidman and Dr. Golato attended and gave welcoming remarks. The main purpose of the Open House was to recruit students into our graduate programs. The main purpose of MATHFest is to promote the mathematical development of under-represented populations. NAM contributed $10,000 and the math department contributed $5,000 in support of MATHFest. Nate Dean, Chair of the Department of Mathematics at Texas State, also serves as President of NAM.

4.4 Expand efforts to promote diversity and inclusion among all faculty, staff, and students.

(CS) CS ran two NSF-funded REU programs involving particularly students from minority groups.

4.5 Seek historically underutilized business suppliers.

(CHEM) n/a

Goal 5: Develop and manage human, financial, physical, and technological resources effectively, efficiently, and ethically to support the university's mission.

5.1 Increase average full-time staff salaries at all ranks.

5.2 Increase number of full time staff.

5.3 Attract and retain highly competent staff by providing annual merit increases based on performance.

5.4 Maintain a physical setting that presents Texas State as a premier institution.

5.5 Implement the Campus Master Plan update for 2012-2017 to ensure it meets the needs of the University.

(CHEM) n/a

5.6 Expand and support professional development opportunities for faculty and staff.

5.7 Continue support for structured, standards-driven web course development and programs that enable faculty to appropriately integrate technology into the teaching-learning process.

(Physics) The physics department has adopted an introductory curriculum package with increased web resources; use of these resources is supported in the Physics Help Center (staffed by Learning Assistants), and allows more time for classroom interaction facilitated by faculty and Learning Assistants.

(Math) Computer Software
We continue to collaborate with classroom technologies to have software installed and kept up-to-date on the computers in the media cabinets, we upgraded the software on the department Macintosh server, and we purchased additional TI-Smartview licenses to support the Development Math and FOCUS instructors.

Online MTE Degree
Master of Education with a Major in Middle School Mathematics Teaching requires 24 hours of Mathematics courses designed to train for middle school mathematics teachers, plus 12 hours of required composite minor courses. This degree is provided almost entirely online through the Office of Distance and Extended Learning

Several of our instructors have designed, revised or taught

correspondence courses offered through the Office of Distance and Extended Learning during 2012-2013 (for example, David Snyder, Theresa Jones, Kathleen MacInnis, and Shawn Peterson.

5.8 Reduce deferred maintenance in existing facilities.

5.9 Improve processes outlined in SACS *Principles of Accreditation* to ensure ongoing compliance with standards, while continuously improving overall educational quality.

5.10 Maintain coordinated assessment processes that assist university stakeholders in multiple assessment activities, including strategic planning, student learning and success, and program excellence.

5.11 Effectively utilize alumni and external constituents to influence and generate human and financial capital opportunities.

(Biology) Contacts to alumni have resulted in the establishment of international research and education activities, and an endowment providing funds for student exchanges.

(ENG) Current interactions with NASA/KSC and NASA/JSC are via alumni relationships.

(CHEM) No Update

5.12 Assess the needs and opportunities to refine Alkek Library utilization to improve support for the achievement of faculty and student instructional and research outcomes.

(MSEC) Used $61k of new program funds to allow library to take advantage of a limited tme offer to permanently upgrade 8 resources from Thompson Scientific that supports graduate-level research primarily in the sciences, but also in the humanities and social sciences.

5.13 Ensure regulatory compliance, environmentally responsible practices and the efficient use of energy and water resources.

5.14 Leverage Enterprise Resource Planning (ERP) and other technology investments to continually improve campus business and instructional support activities.

5.15 Complete the Pride and Action campaign plan to achieve the goal.

5.16 Promote a safe and secure environment.