Engineering *Our* Future

Summer 2012

Texas Tech University - Edward E. Whitacre Jr. College of Engineering

Texas Tech University's
New Petroleum Engineering Building:

A New Era in Petroleum Engineering Production and Operations Education

Inside

Engineering *Our* Future

Summer 2012 Issue

MANAGING EDITOR
Jeff Sammons

CONTRIBUTORS
Jeff Sammons
Scott Self
Chris Cook

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Edward E. Whitacre Jr. College of Engineering
Box 43103
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Dean's Report


Jeff Sammons

Dean Al Sacco Jr., Ph.D.

I am pleased to announce the Texas Tech University System Board of Regents has approved the construction of a new petroleum engineering building on the Engineering Key for the Bob L. Herd Department of Petroleum Engineering (page 6).

The new petroleum engineering building will be a $20,000,000 facility with approximately 40,000 square feet of modern classroom and research space. The building design will feature a unique cluster of laboratories known as the Integrated Petroleum Laboratories. Using a systems approach, each of the labs will be associated with the overall petroleum engineering curriculum or specific courses and will tightly integrate with students' experiences in other laboratories and other disciplines such as geosciences and environmental engineering. This building will set the national benchmark for petroleum educational facilities.

The university has made significant progress in its quest for Tier One status in the last few years; we have met the necessary criteria and are now eligible to receive a share of the state's National Research University Fund (page 3). The Whitacre College of Engineering has played a large role in this process, and our faculty are to be commended for their hard work.

Three of our faculty members received significant research awards this spring. Drs. Hamed Mohsenian-Rad and Siva Vanapalli received prestigious NSF CAREER grants at $400,000 each. You can read more about Dr. Vanapalli's research on page 10. Dr. Harvinder Gill received a Defense Advanced Research Projects Agency (DARPA) Young Faculty Award for his research into the use of pollen grains as vaccine transporters for oral vaccination.

Texas Tech engineering students are making a large impact in national competitions, the classroom, and even the softball field. Our MEMS design team won the "Novel Design" Category for the third straight year at the Sandia National Laboratories MEMS Student Design Contest (page 4). A sophomore chemical engineering major, Brittany Talley, is a top pitcher on the Texas Tech softball team and is maintaining a 4.0 GPA (page 5). A team of Lubbock-area high school students, mentored by Texas Tech engineering students, advanced to the FIRST Robotics Championship, after winning five awards at the regional competition (page 5). Students from the Texas Tech ASME student chapter took top honors at the District E Old Guard Competition (page 4).

The college named five new Distinguished Engineers in April at a luncheon at the Overton Hotel. Rear Adm. John D. Alexander, Elizabeth F. Holland, James E. Lowder, Alan L. Smith, and Dr. Karan Watson were honored for their career success (page 8).

With the assistance of the Engineering Dean's Council and each of the departments' Industrial/External Advisory Boards, the college has embarked on an Undergraduate Laboratory Renovation Initiative. This $5.76MM interdepartmental effort aims to properly equip and modernize departmental teaching laboratories. This multi-year project will have a large impact on the learning experience for our undergraduate students (page 12).


Dr. Audra Morse

I am pleased to announce that Dr. Audra Morse, associate professor of civil and environmental engineering, is the new associate dean for undergraduate studies. She will lead the college's efforts in undergraduate academics and student services.

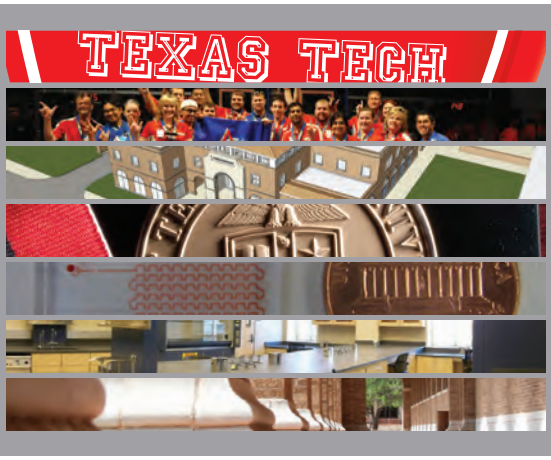
In an effort to assist our students in identifying the best-fit major at Texas Tech, we have implemented a new Foundational Curriculum. This common set of courses will provide our students with a foundation in math, science, engineering, and better prepare them for upper division courses in engineering (page 13).

Our students have asked for greater access to computing resources to assist in their learning and research. In response, we are now in the final stages of installation of electronic locks for all engineering buildings that permit access to computing labs, study areas, and some classrooms and labs. Additionally, we have implemented a new cloud computing portal where students can access specialized engineering software from anywhere in the world on any computer. We will work through the next academic year to expand our software offerings and capabilities in this portal.

Our alumni news section features updates from graduates of the college (page 14) and some recent successes of our alumni. Send us your updated information or stories at www.TTUalum.com.

I hope you enjoy reading about the accomplishments of our students and faculty and the activities and events of the college.

In This Issue



Texas Tech Receives National Research University Designation

Texas Tech received official notice in May from the State Auditor's Office that it has met the necessary criteria and is now eligible to receive a share of the state's National Research University Fund (NRUF). Texas Tech received $7.877 million from NRUF in early June. Additional funding will come each year in the future.

Inclusion to the fund moves the university a step closer toward its ultimate goal of becoming a nationally competitive research university. In March, Texas Tech President Guy Bailey unveiled a 10-year business plan for the university with the end goal of inclusion in the Association of American Universities.

Texas Tech is one of eight institutions designated by the state legislature as emerging research universities in an effort to boost the research capacity of the state's public universities. To qualify for NRUF, universities must meet statutory criteria established by the Texas legislature. Of the eight, only Texas Tech and the University of Houston have met the criteria. *E*

Disser Receives McAuley Distinguished Engineering Student Award

Texas Tech's Edward E. Whitacre Jr. College of Engineering named Daniel Disser the 2012 recipient of the McAuley Distinguished Engineering Student Award.

Provided by members of the Whitacre College of Engineering Dean's Council, this award was established in memory of James A. McAuley, an active member of the Dean's Council and a Texas Tech Distinguished Engineer.

Disser, originally from Montgomery, Texas, competed for this honor and was selected because of his outstanding academic achievements, honors, activities, interests, and aspirations. He is a May 2012 petroleum engineering graduate with a 3.8 GPA.

Disser serves as the president of the Society of Petroleum Engineers (SPE), the college's largest student organization. He has worked to increase the number of community service events that SPE participates in from four to six per semester and has implemented a mentoring program for underclassmen. He previously served as the external vice president of SPE, is a member of the American Association of Drilling Engineers, and Ducks Unlimited.

In the summers of 2010 and 2011, Disser worked for Anadarko Petroleum Corp. as a production engineering intern in Vernal, Utah and a completions engineer in Denver.


Jeff Simmons

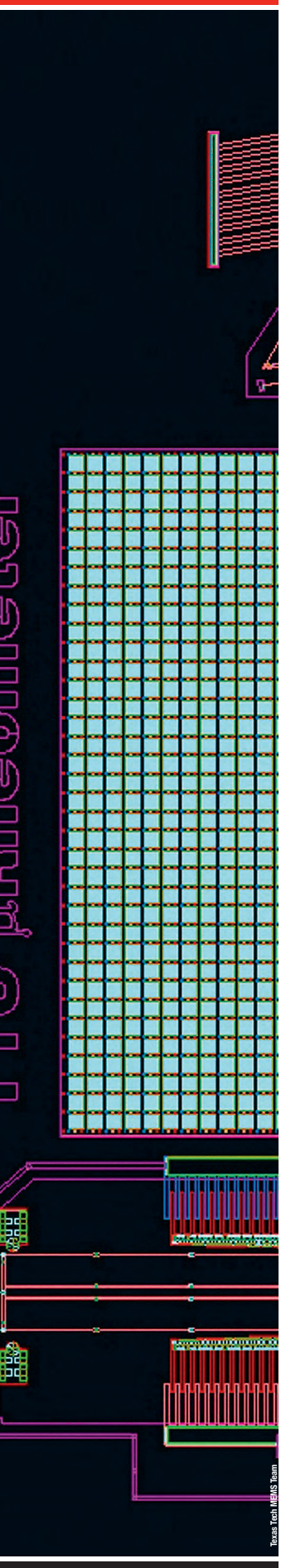
Disser is the 2012 recipient of the McAuley Distinguished Engineering Student Award

Before coming to Texas Tech, Disser completed a bachelor of science in corporate communications at the University of Texas at Austin. After completing his degree, he worked at an oil and gas company in Conroe, where he enjoyed the technical aspects of his job so much he decided return to school to pursue a degree in petroleum engineering at Texas Tech.

Disser accepted a job after graduation with Anadarko in The Woodlands, Texas. He is working as a drilling engineer at the Eagle Ford Shale play designing well plans and monitoring drilling activities. *E*

Laura Lopez

Student News

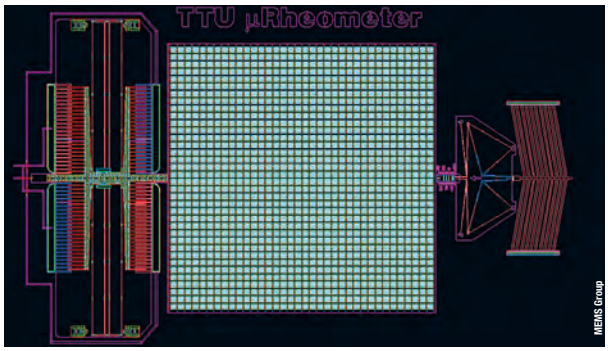


Students Win "Novel Design" Category at Sandia MEMS Contest

Texas Tech students won the "Novel Design" Category for the third straight year at the Sandia National Laboratories MEMS Student Design Contest. Teams from Texas Tech have been winners in the competition in six of the last eight years.

Student researchers presented their microelectro-mechanical system (MEMS) designs to the scrutiny of Sandia engineers. MEMS are a class of microscale devices that are being used in a wide range of commercial applications. Sandia National Labs hosts an annual MEMS design competition for their University Alliance member universities. Texas Tech won the Novel Design category for a microscale rheometer that is 1.2 mm x 2.0 mm.

Rheometers are used to measure material properties. The microscale device incorporates an electrothermally actuated microstage and an integrated capacitance measurement structure to allow more efficient and effective quantification of biological materials and technologically relevant thin films.



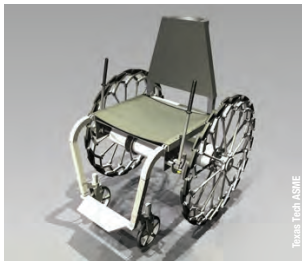
The Texas Tech team won the Novel Design category for a microscale rheometer that is 1.2 mm x 2.0 mm.

The Texas Tech MEMS group, led by Dr. Tim Dallas, associate professor of electrical and computer engineering, teamed up with Dr. Gordon Christopher, assistant professor of mechanical engineering, and his research group to produce the winning design.

The students that contributed to the design submission included electrical and computer engineering students Gautham Ramachandran and Ashwin Vijayasai, as well as mechanical engineering student Zhenhuan Zhang. *E*

ASME Students Place in Old Guard Competition

Pejmon Arbrapour, a senior mechanical engineering major, won first place in the Old Guard Oral Presentation at the American Society of Mechanical Engineers Student Professional Development District E Conference. The presentation was "Reinventing the Wheel: A Radially Collapsing Wheel for an innovative Wheelchair Design."



Wheelchair Design

This competition is designed to emphasize the value of an ability to deliver clear, concise and effective oral presentations, particularly pertaining to some sphere in which an engineer is or should be involved.

Kyle Ellis, a senior mechanical engineering major, won second place on the same topic in the Old Guard Poster Competition at the same conference.

Arbrapour and Ellis will represent District E at the finals of the Old Guard Oral Presentation Competition. The finals will take place at the International Mechanical Engineering Congress and Exposition (IMECE) in Houston on November 9-15. *E*

(L-R) Chase Dorsey, Pejmon Arbrapour, Joseph Campos, Kyle Ellis, and Lauren Clary at the District E Conference.

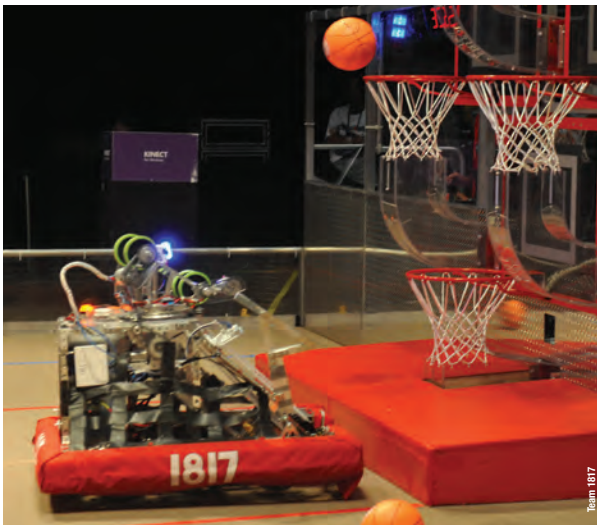
Llano Estacado RoboRaiders Win Robotics Awards

The Llano Estacado RoboRaiders FIRST® Robotics Team 1817 won five awards at the FIRST® Robotics Competition Dallas Regional on March 31, 2012.

The team, mentored by Texas Tech engineering students, advanced to the FIRST Championship held in April, in St. Louis, Mo.

The team won the Regional Chairman's Award, the Engineering Excellence Award sponsored by Delphi, and the Industrial Safety Award sponsored by Underwriters Laboratories. Travis Ray, a Texas Tech graduate electrical engineering student, received the Woodie Flowers Finalist Award and Kenyan Burnham, a senior at Lubbock High School, won the Dean's List Finalist Award.

The RoboRaiders include students from Texas Tech University, Lubbock High School, Coronado High School, Frenship High School, Levelland High School, Southcrest Christian School, and home school students. E



The Team 1817 robot attempts to shoot a basketball into a goal in this year's competition game, Rebound Rumble℠.

The Llano Estacado RoboRaiders include students from Texas Tech, five high schools, and home school students.

Talley Named to Academic All-District Softball Team

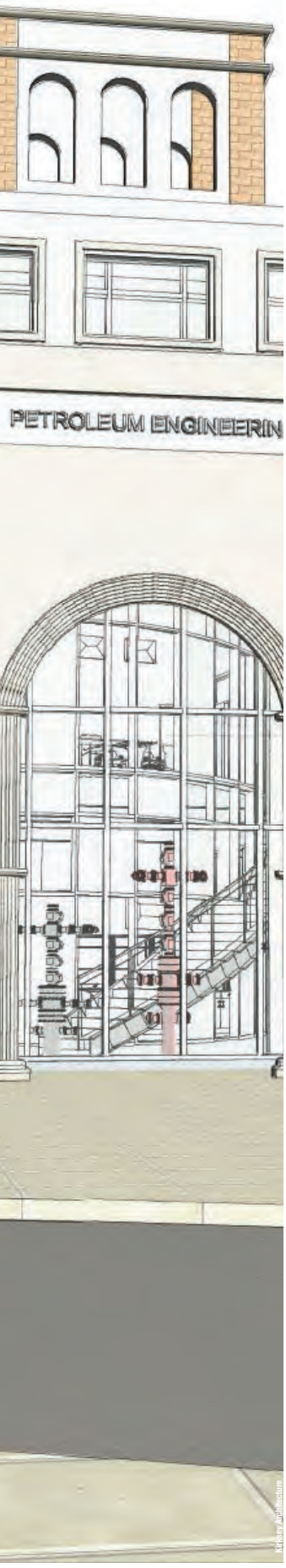
Talley

Brittany Talley, a sophomore chemical engineering major, is a pitcher on the Texas Tech softball team. One of Texas Tech's top two pitchers this year, she is maintaining a 4.0 grade-point average and has been named to the Capital One Academic All-District team by the College Sports Information Directors of America.

A sophomore from Little Elm, Texas, a suburb in the Dallas/Fort Worth metroplex, Talley has been instrumental in Texas Tech's success this season as she reached the 10-win mark for the second-straight year. Talley pitched a one-hit shutout of No. 9 Missouri in mid-April to help lead the Red Raiders to three straight victories over top-10 opponents. She is already among the career leaders in Texas Tech history for wins, earned run average, and strikeouts. E

Brittany Talley is maintaining a 4.0 grade-point average and is a top pitcher for the Texas Tech softball team.

Petroleum Engineering



A New Era in Petroleum Engineering Production and Operations Education

The Texas Tech University System Board of Regents has approved the construction of a new petroleum engineering building on the Engineering Key for the Bob L. Herd Department of Petroleum Engineering.

The new petroleum engineering building will be a $20,000,000 facility with approximately 40,000 square feet of modern classroom and research space. The primary goal of the construction of the new building is to provide a facility that will integrate formal teaching environments with hands-on practical applications using cutting-edge research facilities and techniques. It will set the national benchmark for petroleum educational facilities.

The goal of this project is to begin offering courses and instruction in the new facility by the fall of 2013.

The department is one of the largest in the country, averaging over 500 students, making Texas Tech one of the leading producers of industry ready petroleum engineers. This building will allow the department to grow to 600 undergraduate students.

Industry asked engineering schools to produce more industry-ready engineers…the Bob L. Herd Department of Petroleum Engineering has accepted this challenge, raised admission standards to a 3.0 GPA at Texas Tech, and sustained one of the largest departments in the country.

The existing shared 30-year-old petroleum engineering building is outdated, designed for teaching old production techniques and technologies, and is in need of updating and modernization. Modern facilities, including smart classrooms, state-of-the-art integrated research laboratories, student study areas, and increased space for anticipated departmental growth, are critical for Texas Tech to attain its goals of updating the petroleum engineering program.

The new petroleum engineering research building will feature a unique cluster of laboratories. Through the

Located east of the Industrial Engineering and Mechanical Engineering Buildings on the Northeast corner of the Engineering Key, the new Petroleum Engineering Building's exterior will integrate with the distinctive arches that surround the Engineering Key.

The $20,000,000 facility, with approximately 40,000 square feet of modern classroom and research space, has been designed in the Spanish Renaissance architecture style that has been established on campus and the Engineering Key.

integration of these laboratories, a systems approach will be taken in petroleum engineering education that covers the entire spectrum of exploration and production, including business profitability analysis.

Each of the labs will be associated with the overall petroleum engineering curriculum or specific courses and will tightly integrate with students' experiences in other laboratories and other disciplines such as geosciences and environmental engineering.

The integrated petroleum laboratories will offer students both a theoretical and practical education that compliments classroom material through hands-on applications. The building will feature the following laboratories, teaching, and research areas:

- Unconventional Technology Center
- Fracturing Techniques Center
- Fluids Laboratory
- Reservoir Simulation Center and Drilling Laboratory
- Rheology Laboratory
- Pressure Volume Temperature Laboratory

This building is symbolic of Texas Tech's commitment to the petroleum industry and its investment to propel this program to the top of petroleum engineering departments.

A groundbreaking ceremony will be held this fall on the Engineering Key. *E*

Building Timeline

Petroleum Engineering Building Design and Construction Timeline

May 13, 2011
Regents approve the project

August 31, 2011
Five architectural firm finalists selected from 28 submissions

September 22, 2011
Five architecture firms interviewed

November 2011
Contract signed/Selection of the construction manager at risk

May 17-18, 2012
Board of Regents approve full construction

Fall 2012
Groundbreaking for building

Summer/Fall 2013
Proposed date of occupancy of the new building

Distinguished Engineers

Five Distinguished Engineers Named for 2012

The Texas Tech University Edward E. Whitacre Jr. College of Engineering named Rear Adm. (select) John D. Alexander, Elizabeth F. Holland, James E. Lowder, Alan L. Smith, and Dr. Karan Watson as recipients of the 2012 Distinguished Engineer Award in April at a luncheon in Lubbock, Texas.

The Distinguished Engineer Award was established during the 1966-67 academic year to recognize the most outstanding alumni of the college. Since that time, 207 former students have received this honor.

Recipients of the award must be distinguished in their profession, an inspiration to their peers, and have demonstrated a continuing interest in areas outside the field of engineering.

"The Distinguished Engineer Award is an opportunity for the college to recognize our exceptional former students," said Al Sacco Jr., dean of the college, "Our entire scholarly community is proud of the accomplishments of our latest group of alumni to earn the title 'Distinguished Engineer'. These individuals have distinguished themselves in various and unique ways as outstanding engineers and business leaders and are a testimony to the outstanding education provided by our faculty and staff to all our students: past, present and future."

(From left to right) James E. Lowder, Dr. Karan Watson, Alan L. Smith, and Elizabeth F. Holland. (Rear Adm. (select) John D. Alexander is not pictured.)

Rear Adm. (select) John D. Alexander


Alexander

Alexander graduated in 1982 with a Bachelor of Science in mechanical engineering.

He was commissioned in the U.S. Navy in December 1982 and was designated a Naval Flight Officer in November 1983. He completed sea duty assignments as a bombardier/navigator, strike operations officer, aviation department head, and squadron commander. He has served as the executive officer of the USS Dwight D. Eisenhower and commanded the Amphibious Transport Dock ship USS Juneau. He has accumulated more than 3200 flight hours with 687 carrier-arrested landings. He was named Naval Flight Officer of the Year in 1994.

Alexander is currently the commander of the USS Abraham Lincoln, an aircraft carrier in the U.S. Navy.

Elizabeth F. Holland


Holland

Holland graduated in 1984 with a Bachelor of Science in industrial engineering.

After eight years in defense electronics at Texas Instruments, she has spent the last 20 years in health care, developing and marketing cutting edge medical devices and equipment.

Holland is currently a managing partner at Medical Product Consulting, Inc. in Wadsworth, Illinois

James E. Lowder


Lowder

Lowder attended Texas Tech in the mid-1950s in the Department of Mechanical Engineering.

He worked for more than 50 years in the construction and industrial earthmoving business. He holds 14 U.S. and foreign patents.

Lowder is currently the president of evstar Technologies and is the chair of the advisory committee for the Byron Martin Advanced Technology Center at Lubbock ISD.

Alan L. Smith


Smith

Smith graduated in 1985 with a Bachelor of Science in petroleum engineering.

He has been in the petroleum industry since 1985, working for majors, independents, and consulting firms. He successfully created and sold two independent oil companies and was eventually recruited to join the private equity firm Quantum Energy Partners.

Smith is currently the chief executive officer of QR Energy and Quantum Resources Management in Houston, Texas.

Dr. Karan Watson


Watson

Watson graduated with a Bachelor of Science in electrical engineering in 1977, a Master of Science in electrical engineering in 1981, and a Ph.D. in electrical engineering in 1982.

She joined the faculty of Texas A&M University in 1983, eventually serving in associate dean positions in the Dwight Look College of Engineering from 1991 to 2002. She worked in the provost's office in associate provost, vice provost, and interim positions from 2002 until 2011.

Watson is currently provost and executive vice president for academic affairs at Texas A&M University. She is also president-elect for ABET and will serve as the president for ABET from October 2012-October 2013. *E*

Faculty Research

Vanapalli Receives $400,000 NSF CAREER Award

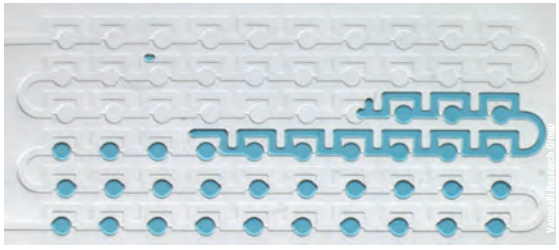
Dr. Siva Vanapalli, an assistant professor of chemical engineering at Texas Tech, has been selected to receive a $400,000 2012 NSF CAREER Award from the National Science Foundation. The five-year award recognizes his career development plan entitled, "Collective hydrodynamics of confined drops in microfluidic parking networks." His proposed research focuses on the fundamental understanding of the traffic and parking of tiny water drops in networks of microchannels that will ultimately yield inexpensive miniaturized devices for rapid screening applications in medicine, biology and materials science.

Vanapalli

In the pharmaceutical industry, scientists conduct chemical and pharmacological tests to discover and produce new drugs for treating diseases affecting human health. The initial discovery process consists of screening hundreds of thousands of molecules to identify potential drug compounds. The process continues by varying the dosage of these candidate drugs to figure out the optimal concentration required for effective treatment.

To conduct this screening, drug companies employ hundreds of robots that carry out millions of pipetting, dispensing, and mixing steps to identify the candidate drug. The costs for this high throughput screening operation run into tens of millions of dollars because of the need for extensive infrastructure and large quantities of reagents. Because of the large library of molecules, this first step in making the drug can take many months to accomplish.

New potential exists in this industry for the use of tiny microfluidic devices. These microfluidic devices are like small plumbing systems with "pipes" that are the size of human hairs. They are fabricated using methods similar to those employed in the semiconductor industry to manufacture computer chips. Scientific research has shown that these microfluidic devices can be used to produce extremely small water drops, whose volumes are about a thousand times less than the pipetting volumes used by robots in the drug industry.



A one microliter water plug containing blue food color dye entering into the network, fragments at each parking spot leaving a remnant of the plug. This approach enables rapid immobilization of large number of parked drops consuming only nanoliter reagent volumes for each drug reaction.

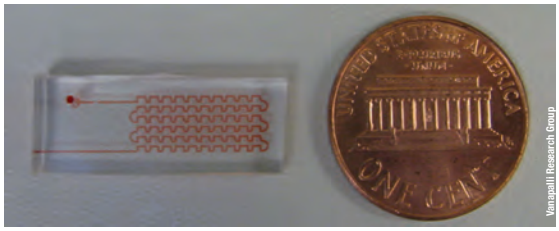
Although drops can be reliably produced using these miniaturized devices, it has been difficult for scientists to immobilize drops of controlled volume and add or remove reagents from these drops – key steps that mimic conventional pipette-assisted dispensing and dilution of fluids.

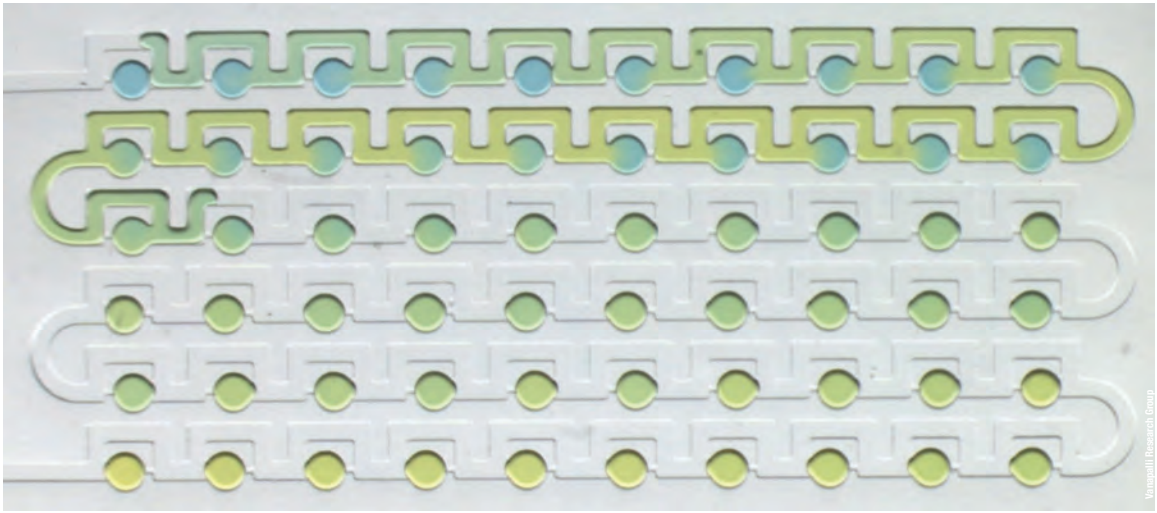
Vanapalli has developed new strategies that allow arrays of nanoliter-scale water drops of controlled volumes to be immobilized in microfluidic devices and also provide the ability to vary concentrations of reagents or other materials from drop to drop in the arrays.

His design involves the creation of microfluidic parking networks (MPNs) within the miniaturized device. Like spaces in an automobile parking lot, trains of water drops and/or long plugs travel down the microfluidic tubes and by effective control of their traffic using fundamental principles of fluid flow, the drops are routed into droplet "parking spaces." The ability to create the "parked," drops, is similar to spotting of fluids by robot-aided pipetting systems. Hundreds of nanoliter-scale drops can be parked within few seconds and drug reactions can be monitored in many individual drops simultaneously, enabling rapid quantitative information on drug effectiveness.

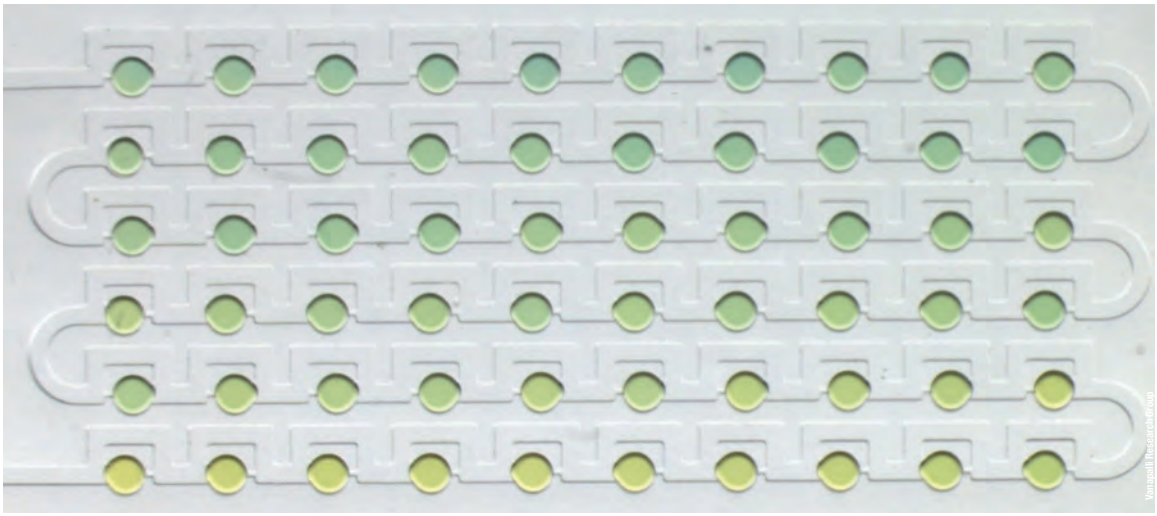
Another important breakthrough from his design of parking networks was the ability to purposefully introduce collision of parked drops and moving water plugs to control reagent concentration from drop to

The penny-sized device containing the microfluidic parking network.





When a yellow-colored water plug is introduced in the microfluidic parking network, it merges with each of blue parked drop, exchanging reagent. The first drop in the array gets the most amount of yellow dye, and the last drop the least amount.



This approach allows generation of reagent variation from drop to drop in the array, offering a simple and inexpensive dilution method for rapid drug screening.

drop in the array. This process allows a simple means to dilute reagent concentration in parked drops enabling rapid identification of optimal dosage of drug concentration.

As part of the CAREER award, Vanapalli will focus on experimental and modeling efforts to predict how water drops move in these parking networks. The scientific results of this work could lead to significant cost and time savings for the drug industry. By carrying out screening experiments at a fraction of the time and cost, his technology has the potential to accelerate drug discovery, making the cost of drugs affordable to consumers.

Vanapalli further plans to explore new opportunities for these devices. For example, conventional methods are not able to quantify the response of individual bacteria to antibiotics. Because the nanoliter-scale parked water drops can capture one or more bacteria, his approaches could be used to study the interactions of single bacteria with antibiotics, helping scientists to understand how bacteria react or mutate when exposed to various concentrations of the antibiotic. Similar approaches could be used to indentify chemotherapy resistant cancer cells. These new opportunities will be pursued in collaboration with Dr. Kendra Rumbaugh, an assistant professor of surgery at the Texas Tech University Health Sciences Center, and Dr. Jerzy Blawzdziewicz, a professor of mechanical engineering at Texas Tech, as part of the Texas Tech Transdisciplinary Research Academy.

Vanapalli joined the Department of Chemical Engineering in the Whitacre College of Engineering as an assistant professor in 2008. He received a Ph.D. in chemical engineering from the University of Michigan in 2006, a Master of Science in food science in 2001 from The Pennsylvania State University, and a Bachelor of Technology in agricultural and food engineering in 1998 from the Indian Institute of Technology. *E*

Laboratory Renovation Initiative

Jeff Simmons

College Launches New Renovation Initiative for Teaching Laboratories

The Whitacre College of Engineering Undergraduate Laboratory Renovation Initiative is a $5.76MM effort to properly equip and modernize departmental teaching laboratories. This is an interdepartmental initiative to enhance the learning experience for all undergraduate students. By providing undergraduate students with modern equipment and aesthetically pleasing labs, these hands on teaching environments will better prepare our students for industry.

All of the undergraduate majors within the college participate in essential laboratory experiences as part of their curricular programs. An emphasis on laboratory-based team learning is consistent with the basic goals of the college. The industrial size and quality of laboratory and research equipment in the college facilitates this effort.

Keeping the college's extensive variety of equipment up-to-date with modern techniques and processes is not possible without industry support, as most engineering courses have a laboratory component.


File Photo

Undergraduate teaching laboratories provide a foundation that leads to well-prepared Red Raider graduates.

Texas Tech places a priority on undergraduate research and practical experiences in the classroom, which necessitates the need for state-of-the art equipment and modernization of many of the undergraduate labs. *E*

Undergraduate Laboratory Renovation Initiative

Laboratory Listing

Department of Chemical Engineering

Undergraduate Teaching Labs

Department of Civil and Environmental Engineering

Environmental Engineering Teaching Laboratory
Geotechnical Engineering Laboratory
Structures Laboratory
Mechanics of Fluids Laboratory
Construction Materials and Mechanics of Solids

Department of Electrical and Computer Engineering

ECE Undergraduate Laboratory

Department of Construction Engineering and Engineering Technology

Computer Labs

Department of Industrial Engineering

Advanced Manufacturing Laboratory
Ergonomics Laboratory

Department of Mechanical Engineering

Mechanics and Materials Laboratory
Dynamic Systems & Control Laboratory
Machine Shop Laboratory

Foundational Curriculum

College Admission Requirements Elevated

Admission to the Whitacre College of Engineering

Effective January 2013, the criterion for admission to the Whitacre College of Engineering Foundational Curriculum requires that a first time freshman or transfer student with fewer than 12 hours of transfer credit must be accepted to the university with assured admission status. The criteria used to determine assured admission status are SAT/ACT scores and class rank as shown at right.

For transfer students with 12 or more hours of transfer credit to receive direct admission to the college, these students must have 24 or more hours of transferable coursework and have a minimum cumulative GPA of 3.0 that includes the work at all previous institutions.

Regardless of the number of hours and the specific courses included in the transfer credits, external transfer students are initially accepted into the lower-division Whitacre College of Engineering Foundational Curriculum of their degree program and must complete a minimum of 12 hours of Texas Tech coursework before application to the upper division.

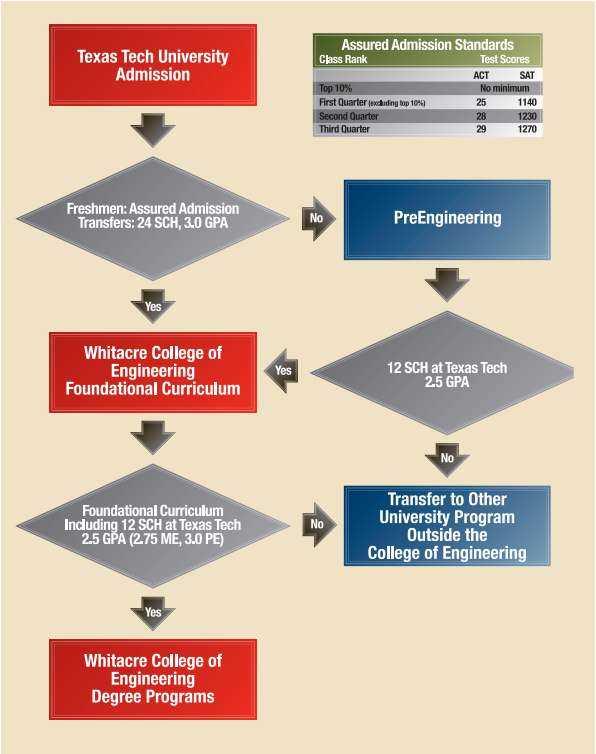
Eligibility for admission to the upper division is based exclusively on the cumulative GPA earned at Texas Tech.

PreEngineering

Students who do not meet the Whitacre College of Engineering admission requirements are admitted initially to the Texas Tech University PreEngineering Program and may apply for admission to the Whitacre College of Engineering Foundational Curriculum upon satisfaction of the college internal transfer admission standards.

Whitacre College of Engineering Foundational Curriculum

All new admissions to the Whitacre College initially work to complete a foundational curriculum consisting of English I, English II, Calculus I, and Calculus II plus two science courses and a first engineering course that vary among the engineering degree programs. The foundational curriculum is supplemented with courses from the university core curriculum and first general engineering courses (statics, thermodynamics, circuits, and materials science) to provide the opportunity for full course loads and scheduling flexibility.



This flowchart details the admissions process for entry into the college's degree programs.

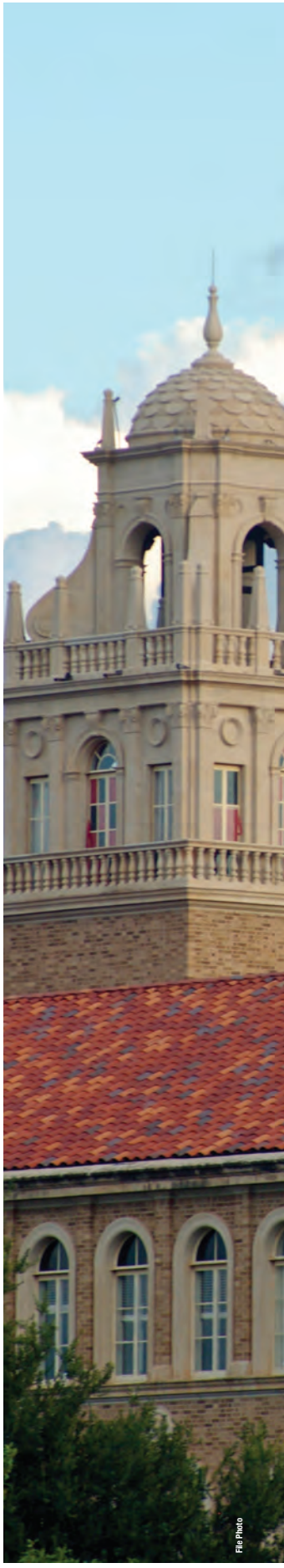
Whitacre College of Engineering Degree Programs

When the foundational curriculum has been completed, students apply for admission to the upper division of their degree program. The acceptance criterion is based exclusively on a Texas Tech cumulative GPA that includes a minimum of 12 hours of coursework from the foundational curriculum. This must include MATH 1451 (Calculus I).

The specific GPA standard varies among the degree programs and may change from one academic year to the next as necessary to align enrollments with the educational resources.

Students must be prepared to make an alternate choice of major if their foundational curriculum GPA does not qualify them for their preferred major.

Students who are not successfully admitted to an upper-division degree program are not allowed to enroll in engineering courses and must transfer out of the Whitacre College of Engineering. *E*



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Alumni Updates

Whitacre College of Engineering Alumni Updates

1954

Adrian Hill, a 1954 graduate with a Bachelor of Science in mechanical engineering has retired from Westinghouse Bettis Atomic Power Laboratory Naval Reactors Facility in Idaho Falls, Idaho after 40 years in both Pittsburgh and Idaho.

1971

Dr. Lex A. Akers, a 1971, 1973, and 1975 graduate with B.S., M.S., and Ph.D. degrees in electrical engineering, is the founding dean of the Caterpillar College of Engineering and Technology at Bradley University in Peoria, Ill.

1977

Charles Lynn, a 1977 and 1979 graduate with a B.S. and M.S. in industrial engineering, lives in Tucson, Arizona and works for Raytheon.

1984

Robert Kornafel, a 1984 graduate with a Bachelor of Science in engineering technology, lives in Poway, Calif. and works for General Atomics, Electromagnetics Systems Group.

1985

Shafiq Nasser, a 1985 graduate with a Bachelor of Science in electrical engineering technology, lives in Plano, Texas and works for DFW Shredding.

Stephen Parris, a 1985 graduate with a Bachelor of Science in mechanical engineering, lives in Wichita, Kansas and works for Koch Pipeline.

1989

Patty Pomper Leeman, a 1989 graduate with a Bachelor of Science in civil engineering, lives in Arlington, Virginia and founded Leeman Consulting Services, LLC to provide assistance to growing non-profit organizations.

1995

Mark Scorgie, a 1995 graduate with a Bachelor of Science in mechanical engineering, lives in Chula Vista, Calif. and is commanding officer at the U.S. Navy Mine Warfare Training Center.

Michael Voigt, a 1995 graduate with a Bachelor of Science in mechanical engineering, lives in Wichita, Kansas and works for Cessna Aircraft Co.

1996

John Saenz, a 1996 graduate with a Bachelor of Science in petroleum engineering, lives in Midland, Texas and works for Tabula Rasa Energy.

1997

Jennifer Bell, a 1997 graduate with a Bachelor of Science in mechanical engineering and a Department of Mechanical Engineering Industrial Advisory Board member, was honored as a 2011 Women of Excellence by the Federation of Houston Professional Women.

Shannon Ogerly, a 1997 graduate with a Bachelor of Science in mechanical engineering, lives in Niceville, Florida and works for General Dynamics Ordnance and Tactical Systems.

1998

Chris Larson, a 1998 graduate with a Bachelor of Science in electrical engineering and a 2000 graduate with a Master of engineering, lives in Fort Worth, Texas and works for Lockheed Martin Missiles and Fire Control.

2000

Joshua Jackson, a 2000 graduate with a Bachelor of Science in electrical engineering, lives in Austin, Texas and works for Pike Energy Solutions.

James Naylor, a 2000 graduate with a Master of environmental engineering, lives in Burleson, Texas and works for Alan Plummer Associates, Inc.

2003

Jorge Flores, a 2003 graduate with a Bachelor of Science in industrial engineering, lives in Eagle Pass, Texas and works for Eagle Pass Water Works System.

2009

Travis Horn, a 2009 graduate with a Bachelor of Science in electrical engineering, lives in Grapevine, Texas.

2011

Chris Lindenmuth, a 2011 graduate with a Bachelor of Science in mechanical engineering, lives in Houston, Texas and works for Adhesive Services Company.

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Find us at www.facebook.com/TexasTechEngineering. E

Guthikonda Named Most Valuable Professional by UCTA


Guthikonda

Gopal K. Guthikonda, P.E., a 1983 Texas Tech graduate with a Master of Science in civil engineering, received the 2012 Most Valuable Professional Award from the Underground Construction Technology Association and Underground Construction Magazine.

Guthikonda was recognized as a driving force in providing engineering support for the execution of the water and wastewater improvements in Austin, Texas, and for the implementation of the city's Water and Wastewater Capital Improvement Program.

As assistant director of the Engineering Services Program with the Austin Water Utility, in Austin, Texas, he is responsible for providing engineering support functions for the execution of all of Austin's water and wastewater improvements. E

Harkins Wins Gold Medal Award and National Recognition Award


Harkins

Dr. Victoria Richards Harkins, P.E., D.WRE, a 1995 Texas Tech graduate with a Master of Science in civil engineering and a 1998 graduate with a Doctor of Philosophy in civil engineering, was awarded the American Council of Engineering Companies (ACEC) Texas Gold Medal Award and an ACEC National Recognition Award.

The award was given for Harkins' work on a project that involved the design and development of a restoration plan for the direct removal of silt and invasive plant vegetation from six miles of Davis and Hamilton Creeks in the Texas Hill Country area.

Harkins is president of Harkins Engineering, Inc., a firm that provides environmental, municipal and civil engineering consulting services to governmental and private corporation clients. E

McCavit Receives Mary Kay O'Connor Process Safety Center Merit Award


McCavit

Jack McCavit, a current member of the Chemical Engineering External Advisory Board and a 1970 Texas Tech Bachelor of Science in chemical engineering graduate, received the Mary Kay O'Connor Process Safety Center Merit Award for 2011.

The award recognizes an individual who has made significant contributions to the advancement of education, research, or service activities related to process safety concepts and/or technologies.

McCavit became an independent consultant at JL McCavit Consulting, LLC in 2005 after working for Celanese Chemical Company for 35 years. He is a Fellow of the Center for Chemical Process Safety (CCPS) and a CCPS Staff Consultant. He served as chair of the CCPS committee that developed the book, Guidelines for Risk Based Process Safety. E

Larrañaga Named to NIOSH Board of Scientific Counselors


Larrañaga

Dr. Michael Larrañaga, a Texas Tech graduate with a Doctor of Philosophy in industrial engineering, has accepted an invitation from the Secretary of Health and Human Services to serve on the Board of Scientific Counselors for the National Institute for Occupational Safety and Health at the Centers for Disease Control and Prevention.

He will serve a three-year term on the board, which conducts research, experiments, and demonstrations to advance occupational safety and health.

Larrañaga is the department head of the Fire Protection and Safety Engineering Technology program, a Simplex Professor, and the director of the Boots & Coots Center for Fire Safety and Pressure Control at Oklahoma State University. E


Jeff Simmons

TEXAS TECH UNIVERSITY
Edward E. Whitacre Jr.
College *of* Engineering™

Engineering *Our* Future

Box 43103 | Lubbock, Texas 79409-3103

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Find us at www.facebook.com/TexasTechEngineering

Summer 2012

The spring 2012 Engineering Job Fair was held on February 15. More than 1,600 students had the opportunity to visit with approximately 120 companies and 340 recruiters.

Jeff Simmons