

College of Engineering Bulletin

May 2008

CENG Update Dr. Oscar Garcia, Founding Dean Thank you!

As we approach the 2008 spring graduation and the end of my last semester as your College of Engineering Founding Dean, I would like to take advantage of this opportunity to reminisce about the last 5 years. Two new departments (Electrical Engineering and Mechanical and Energy Engineering) and three new programs (BS in Computer Engineering, BS in Construction Engineering, and BA in Information Technology) have been started and are thriving. We are in the advanced planning stages of two novel programs: a Biological and Environmental Engineering program and a Mechatronics program. We expect these two new programs to be available soon.



We have achieved an all-time-high of 68 instructors, including 53 tenure and tenure-track faculty, and reached nearly 1600 engineering students in the College. Our research expenditures have reached a record \$3.7M, excluding a \$4M congressional allocation. We have established an NSA-certified Center for Information and Computer Security and an interdisciplinary Center for Advanced Research and Technology (CART) and have received a \$1.5M endowment for creating the PACCAR Technology Institute in the Mechanical and Energy Engineering Department supporting also a professorship in that department. We have renovated the original TI building at the Research Park (now appropriately renamed Discovery Park) in a comfortable and educationally sound manner, with a cafeteria and some amenities for the students and faculty.

But there is so much more to do....

Our faculty has developed and approved a new College Constitution. The School of Library and Information Sciences and the Educational Technology Division of the College of Education will be moving to Discovery Park into space to be renovated, increasing our opportunities for collaboration.

After a nationwide search, Dr. Costas Tsatsoulis has been chosen as the new dean to guide the College to yet higher levels of accomplishments. Dr. Tsatsoulis comes from the University of Kansas, where he is currently chair of the Department of Electrical Engineering and Computer Science.

I have faith in the future of the College of Engineering and of UNT and only ask that you continue to give the new Dean at least the same level of warmth and cooperation that I have received from you!

Thank you all, faculty, staff and other friends, for the last 5 growing years and the great honor of having me as your first Dean!

Academic Affairs Dr. Reza Mirshams, Associate Dean



The University of North Texas Honors Day was held April 11, 2008, at the Murchison Performing Arts Center. The following students from the College of Engineering were recognized: Srivamsi Tarigopula, Outstanding Master's Student in Computer Engineering; Paul Stroufe, Outstanding Undergraduate Student in Computer Engineering; Prakash Reddy Kolan, Outstanding Ph.D. Student in Computer Science; Husain Husna, Outstanding Master's Student in Computer Science; Hector Guillermo Cuellar Ríos, Outstanding Undergraduate Student in Computer Science; Mark Pickens, Outstanding Engineering Technology Graduate Student; Ryan Tighe, Outstanding Construction Engineering Technology Student; Michael Braunstein, Outstanding Electronics Engineering Technology Student; Brigeetee Montero, Outstanding Manufacturing Engineering Technology Student; Bryan Seitz, Outstanding Mechanical Engineering Technology Student; and Gregory Bryan, Outstanding Nuclear Engineering Technology Student.

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Dr. Reza Mirshams, Associate Dean (continued)

The Student Government Association awarded Dr. Farhad Shahrokhi of the Department of Computer Science and Engineering the recognition of "Honors Professor." The following faculty and staff of the College of Engineering were nominated by students for recognition: Dr. Ram Dantu, Computer Engineering; Dr. Yan Huang, Computer Science; Dr. Michael Kozak, Engineering Technology; Dr. Reza Mirshams, Engineering Technology; Dr. Saraju Mohanty, Computer Science and Engineering; and Dr. Vijay Vaidyanathan, Engineering Technology.

Christopher Heiden of the Dean's Office is a semifinalist in the Fulbright U.S.-Germany International Education Administrators Program. Carmen Banea and Samer Hassan, graduate students in Computer Science and Engineering, have been recognized with an International Award of Excellence.

The College of Engineering Office of the Dean, with support from the Office of the Provost and the Mathematics Department, will host The Mathematics Bridge Program June 24-28 and July 22-26, 2008. The 3-day Bridge Program is to assist students to perform well on the Accuplacer Placement Exam, administered at orientation to determine which math class they may enroll in their first semester at UNT, and also provides an intense review of key materials from algebra and trigonometry to prepare students to take engineering calculus.

As the school year draws to a close, the College of Engineering Advising Staff prepares for the 19 summer orientations to receive and register new and transfer students for next fall. Preliminary numbers indicate the College will once again experience growth in all majors. This growth is due to the new and expanded programs and better visibility in the marketplace.

The College celebrated Engineers Week in February. Events included presentations by distinguished speakers from industry, student-sponsored contests, departmental open house and demonstrations, a job fair exclusively for engineering students, and a banquet that honored outstanding students and faculty.

Continued growth has been met with added comforts. The cafeteria has proved to be a success and has exceeded expectations. A new patio courtyard has been built for outside relaxation, and plans for a lounge/game room are being discussed. During the first week in October, the College will host its first autumn career fair. Companies wishing to participate should contact Glenn Jensen at careercenter@unt.edu. Plans are being made to relocate the Advising Office to the Research/Discovery Park from its main campus location this fall. This move will consolidate Academic Services and provide undergraduate advising in a convenient location nearer to the College's departments.

Outreach and Public Relations Dr. Miguel García-Rubio, Associate Dean



The College of Engineering celebrated Engineer's Week 2008. The keynote speaker was Kent Novak, Vice President and General Manager of Texas Instrument's Medical and HiRel unit. Kent spoke about "New Areas in Engineering at Texas Instruments." We also had a presentation by Craig Berry, Sr. Vice President and CIO of Siemens PLM. Craig talked about "Professions in IT and the new BA in Information Technology at UNT." The College of Engineering recognized faculty teaching, research, and service achievement at the Engineer's Week Banquet. Participating in the event from the



Dr. Robert Akl (left)

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Dr. Miguel García-Rubio, Associate Dean (continued)

University of North Texas, were Dr. Bonita Jacobs, Vice President of Student Development; and Dr. Vishwanath "Vish" Prasad, Vice President of Research and Economic Development. The College of Engineering honored three faculty members with a College of Engineering Advisory Board Award of \$1,000 each. Dr. Robert Akl, from Computer Science & Engineering, received the Teaching Award; Dr. Nandika D'Souza, from Materials Science and Engineering, re-ceived the Research Award; and David Keathly, from Computer Science and Engineering, received the Service Award. Dr.



Dr. Nandika D'Souza (right)



David Keathly (left)

Myles for Outstanding Student Volunteer. Our Dean, Dr. Oscar N. Garcia, received an engraved glass award (Mark Pickens) in recognition of his contributions to the College of Engineering. On February 22, the College of Engineering held its first College of Engineering Advisory Board (CEAB) meeting of the year, with participation of eight of its members. Ms. Euline Brock chaired the meeting. Dean Oscar Garcia presented the college report, and members participated in discussions on the CEAB Financial Assistance Fund, resource development, marketing activities, and a request to create a Vice

Reza Mirshams recognized the Buckles recognized the research awardee. The Center for Student Development honored outstanding student leaders and student organizations by awarding them Copper Eagle Head trophies. The recipients of those awards were David Keathly for Outstanding Advisor, the National Society of Black Engineers (NSBE) for Outstanding Organization, Mark Pickens for Student Leadership, and Megan



Dr. Oscar N. Garcia

Chair position for the CEAB. The College of Engineering hosted visits from Wells Fargo, Siemens, Jostens, and the Hispanic Women Network of Texas (HWNT). The College of Engineering is in a good position to continue its outreach activities in support of recruitment of new students, growth of the CEAB membership, and a more intense development program.



Megan Myles: Outstanding Student Volunteer

Research Update Dr. Bill Buckles, Associate Dean

Research is an important component of the education enterprise. Last year, as measured by research expenditures, the College of Engineering accounted for 35% of the supported research at UNT. From a national point of view, the research performed by universities is an important component of the job creation process. According to the report "Gathering Storm," published by the National Research Council, 85% of the rise in income in the United States is attributable to technological change. Nearly all technological advances begin in university labs.

From the point of view of the university, research is the source of a key income stream. Last year, the research expenditures for UNT were approximately \$13M. This is still a small portion of UNT's overall budget of \$580M, and we are endeavoring to see that research becomes a more significant part of our profile. This income stream allows capitalization funds for many labs, permits growth of the graduate program via stipends for research assistants, and provides new on-campus employment for undergraduates.

From the point of view of the College of Engineering, all university benefits apply. Additionally, there are intangible advantages. An active, supported research environment improves the quality of classroom instruction, enhances the visibility of the College regionally and nationally, and ultimately improves our chances of attracting the most talented faculty to Discovery Park.



Engineering Technology (ETEC)

Dr. Nourredine Boubekri

Since the fall semester 2007, departmental programs and activities have significantly evolved. The faculty have worked hard to prepare for a successful ABET accreditation visit of our bachelor's programs in Mechanical Engineering Technology, Electronics Engineering Technology, and Manufacturing Engineering Technology. At the same time, the Department developed a new Bachelor of Science in Mechatronics Engineering that is expected to begin in spring 2009 (pending THECB approval). The Department also developed a new Master of Science in Engineering Systems that is being offered with concentrations in Mechanical and Electronic Systems. A concentration in Construction Management is expected to start in fall 2008. These initiatives have received overwhelming support from our constituencies.



The department has also instituted a new advising system, whereby each student has an assigned department faculty advisor for the duration of study. All departmental teaching laboratories have been updated with state-of-the-art computers and instrumentation. A new metrology lab has been created to enhance the laboratory experience in all programs. Two additional laboratories have been developed to support our Construction Engineering program.

The Department has increased its capacity of offerings by hiring a tenure-track faculty member in Construction Engineering Technology; another faculty member in the same program is expected to join our Department in fall 2008. A tenure-track faculty member will be joining the faculty of our Mechanical Engineering Technology program in June 2008.

The number of publications increased more than 100% last year. Research funding secured by faculty has increased more than 65% during that same period, approaching \$1 million. At the same time, the faculty continues to collaborate with industry partners to support students' learning through internships and co-ops and student-oriented research.

Computer Science and Engineering (CSE)

Dr. Krishna Kavi

This summer, our CSE Department will sponsor multiple Robocamp summer programs at Discovery Park, at UNT Dallas, and for Lewisville ISD. The program received \$30,000 from Motorola Foundation and \$102,000 from the Texas Workforce Commission for a 2-year period. The TWC later awarded an additional \$30,000. The RGK Foundation has given \$15,000 to support Robocamp. Previously offered only to young women in grades 8 through 12, Robocamps have now expanded to include young men in the same grades as a result of these grants. CSE faculty members Robert Akl, David Keathly, and I have been working together on Robocamps for the past three summers. For more information, go to <http://www.cse.unt.edu/~dkeathly/robocamp/>.



The Net Centric Software and Systems Consortium sponsored an NSF Industry University Cooperative Research Center Planning Meeting in February 2008. I am the principal investigator and the initial director of the software consortium that was established with the four major universities in the Dallas-Fort Worth area: UNT, the University of Texas at Dallas, the University of Texas at Arlington, and Southern Methodist University. For more information, go to <http://www.csrl.unt.edu/~kavi/NetCentric/>.

Two CSE faculty members were recognized at the College of Engineering banquet during National Engineers Week in February 2008. Dr. Robert Akl, Assistant Professor in the department, received the UNT College of Engineering Excellence in Undergraduate Teaching Award. David Keathly, lecturer and advisor in the department, received the Engineering Faculty Contribution Award for outstanding service to the College. Mr. Keathly also received the Outstanding Advisor award from the Center for Student Development.

For the fifth consecutive year, Microsoft has awarded its Most Valuable Professional (MVP) Award to Dr. Ian Parberry in the Windows-XNA/DirectX category. Microsoft presents the MVP Award to thank individuals for their exceptional contributions to technical communities worldwide. Dr. Parberry was on the Program Committee for GDCE '08 – the Third Annual Microsoft Academic Days Conference on Game Development in Computer Science Education – held in March 2008.

Dr. Phil Sweany, CSE Associate Professor, represented the College of Engineering in planning a \$2.4 million grant-funded program at UNT that will increase the number of undergraduate math, science, and computer science majors obtaining teaching certification. Teach North Texas (TNT) is a collaborative effort among the Colleges of Arts and Sciences, Education, and Engineering.

The CSE programming team of John Rizzo, Hector Cuellar, and Robbie Mitchell Burke won the ACM South Central Regional Programming Competition in November 2007. This is the first time a UNT team has advanced to the World Finals in the ACM Programming Contest sponsored by IBM. The World Finals will be held in April 2008 in Banff Springs, Canada.

Mechanical and Energy Engineering

Dr. Nourredine Boubekri

UNT's MEE Department is implementing its development plan with an enrollment this year of about 100 undergraduate students and 8 graduate students at the Master's level.

A unique feature of the undergraduate curriculum is in part the inclusion of emphasis on energy systems. A distinct course, "Mechanical and Energy Engineering Practice," gets the students fast on track in this field. It is an introduction to practice through weekly presentations by UNT faculty and practicing engineers from local companies. The Department is indebted to participating companies including Biodiesel

Industries, Inc.; ACME Brick; Denton County Transportation Authority; C. H. Guenther & Son Incand DRS Sensors & Targeting Systems, Inc.

The Department faculty continues to develop both teaching laboratories and course curricula as well as aggressively building research laboratories, developing research proposals, and involving undergraduate students in their research projects. Each of the faculty members in the department is heavily involved in mentoring graduate students at the master or doctoral level as leads or as committee members. They have teamed with other faculty in the college or across the university to collaborate on a number of research proposals.

Dr. Nourredine Boubekri, Professor and Department Chair of Engineering Technology, is filling in as interim chair of MEE until a permanent chair is hired. PACCAR Institute is in full swing with the expected hiring of its director who will join the department on or before September 2008 and with the completion of the corresponding laboratory and office spaces. I see a bright and exciting future for the department, judging by the capabilities, enthusiasm, and motivation of its faculty and staff to build an exemplary department for its stakeholders.



Materials Science and Engineering (MSE)

Dr. Rick Reidy

2007 was an exciting growth year for our department. We initiated our undergraduate program with an enrollment of 20 students. We will graduate our first class in 2009 and hope to double our student enrollment in 2 to 3 years. Two new faculty members joined us as assistant professors: Dr. Jincheng Du and Dr. Srinivasan Srivilliputhur. Dr. Du received his PhD from Alfred University and subsequently held post doctoral positions at Pacific Northwest National Laboratory and the University of Virginia. His research has been in computational materials science, specifically classical and ab initio methods to study glass structures, oxide ceramics, material interfaces, and catalysts. Dr. Srivilliputhur received his PhD from the University of Washington in Materials Science and Engineering in 1999 and was a postdoctoral associate and later a permanent staff member at Los Alamos.



During 2007, several faculty received significant funding from Federal agencies:

- "Atomically Precise Manufacturing," \$735K/4.5 years, Defense Advanced Research Projects Agency and Texas Emerging Technology Fund in collaboration with Syvex, UTD, UIUC, UT, NIST - \$15M total funding, Dr. Gorman
- "Multi-faceted Scientific Strategies Toward Better Solid-State Lighting of Phosphorescent OLEDs," \$333,321/1year, Department of Energy, Dr. Shepherd, co-Pi with Dr. Omary of the Chemistry Department
- "Cooperative Agreement on Metrologies for Nanotailored Multifunctional Materials," \$531K/3 years, NIST, Dr. D'Souza
- "Probing the Early Stages of Second Phase Nucleation and Phase Separation in Titanium Alloys," \$180K/3 years, National Science Foundation, Dr. Banerjee
- "Structure and Interface Evolution in Self-Lubricating Coatings and Nanocomposites for Moving Mechanical Assemblies," \$210K/3 years, NSF, Dr. Scharf

Total new unrestricted research funding totaled more than \$2M from January 2007 to March 2008.

Drs. Gorman and Banerjee organized and hosted the Laser Engineering Net Shape/Maskless Mesoscale Material Deposition users group meeting at UNT. Dr. Brostow continued to serve as president of the International Council on Materials Education. Dr. D'Souza served as a member of the Board of Directors of the Polymer Division of the Society of Plastics Engineers. Dr. Scharf was president of the Solid Lubricant Technical Committee of the Society of Tribologists and Lubrication Engineers. Dr. Needleman was inducted into the American Academy of Arts and Sciences. Dr. Reidy served as director of the Texas Governor's School, a 3-week program for 152 advanced high school students at UNT (renewed for 2008). Three Texas Academy of Mathematics and Science students who conducted research with MSE faculty received national awards: Alisha Seam, national semifinalist, Intel Science Talent Search; Ratul Pujari, national semifinalist, Siemens Math-Science-Technology competition; and Jonathan Too, national semifinalist, Siemens Math-Science-Technology competition. Haley E. Hagg Lobland, PhD student working with Dr. Brostow, received an International Union of Pure & Applied Chemistry Student Poster Prize at POLYCHAR 15 (Rio de Janeiro) and the First Young Investigator Prize at the 4th International Conference on Advances in Petroleum & Gas Industry & Petrochemistry, Lviv, Ukraine.

Electrical Engineering

Dr. Murali Varanasi

The Electrical Engineering (EE) Department is enjoying a steady growth of students at the baccalaureate and Master's level with an enrollment of 170 undergraduate and 25 graduate students. We are pleased to announce the addition of Mr. Charles Bittle and Dr. Walter Delashmit as adjunct faculty. In addition to teaching, Mr. Bittle is also assisting the undergraduate students with advising, which is very important as the department prepares to seek ABET accreditation during the 2009-2010 academic year. We are also pleased that Mr. Oluwayomi Adamo will be joining the department as a lecturer during the 2008-2009 academic year. He will continue to teach and support the project-oriented EE program. To accommodate the rapid growth in the EE program, three new laboratories, which include a 30-seat student laboratory and two research laboratories, will be available in fall 2008. The laboratories will be furnished with the state-of-the-art CAD tools such as Cadence, Xilinx, LabView, MatLab, and equipment that consists of digital storage oscilloscopes, digital multi-meter, function generators, and power supplies.



As a demonstration of the success of our project-oriented EE program, several of our undergraduate students will be presenting their papers at the IEEE Region 5 Technical, Professional, and Student (TPS) Conference, which will be held in April 2008. We congratulate the students (Eric Ayeh, Kodjo Agbedanu, and Yasu Morita) for their accomplishment. We also congratulate Karok Chatterjee, one of the TAMS students, on his being selected as a semifinalist in the Intel Talent Search. Karok also received honorable mention from the Barry M. Goldwater Scholarship committee. Our faculty continues to actively pursue research in Digital and Wireless Communications, Sensors and Sensor Networks, Coding Theory, Pattern Recognition and Image Processing, and VLSI Design. Faculty research activities include grants from the National Science Foundation, the Army Research Laboratory, and Broadband Instruments and publications in several journals and conferences. The department is actively seeking a senior faculty member to further strengthen our research.

Biological and Environmental Engineering (BEE)

Dr. Miguel F. Acevedo

The College of Engineering continues to develop a unique, innovative, interdisciplinary program in BEE at the B.S. and M.S. levels. This program is developing in partnership with several UNT programs in the College of Arts and Sciences, the School of Library and Information Science, and the College of Public Affairs and Community Service. Very importantly, it includes collaborations with the Biomedical Sciences and Public Health programs at the UNT Health Science Center in Fort Worth. The BEE planning committee, which includes representatives from several of these units, has completed designing the curricula, and these have been approved by the curriculum committee. The curricula have been submitted to the university curriculum committee for review and approval. The target date for starting the program is fall 2009. Students may consult with College advisors or the BEE program coordinator on courses to take in 2008-2009 to get ready for this exciting program.



BEE serves as the home and key player of the Texas Environmental Observatory (TEO) and has attracted NSF attention and has received two important grants. We have developed mini-courses on the use of wireless sensors and on databases for environmental monitoring and modeling. Attendees of the mini-courses include personnel from local governments of the North Texas area and high school teachers. TEO will soon enter in collaborative national efforts with the National Ecological Observatories Network (NEON), an evolving major scientific endeavor, already approved by Congress and moving forward at the NSF. Our neighboring study sites are selected to be one of the 20 NEON core sites in the country. We will organize studies at this core site in collaboration with the University of Oklahoma and Oklahoma State University.

Global challenges require engineers to understand how the world works and to engage in intercultural thinking. BEE includes a global approach: establishing partnerships and collaboration agreements with universities and institutions abroad. We have hosted academic visitors from Universidad de Alicante, Spain (focusing on dendrochronology and climate) as well as from East China Normal University, Shanghai (focusing on remote sensing and wireless sensors).

During the winter intersession, we conducted a very successful UNT study-abroad program on human-nature interactions in Nepal in collaboration with faculty and students of Kathmandu University and Tribhuvan University.

A research cluster proposal, "Global Change Observatory and Action" (GCOA), has been submitted to the UNT administration. This cluster addresses the challenges of global environmental change by means of interdisciplinary research, nanotechnology, and biotechnology development, and science and engineering education. Our collaborations with universities in Venezuela, Spain, Nepal, China, and the Amazon basin association of universities, would serve as a research platform with colleagues throughout the world, ranging from Amazonian tropical forests to Himalayan glaciers.

Office of the Dean

Dr. Oscar García	Founding Dean	NTRP A145	(940) 565-4300
Dr. Reza Mirshams	Associate Dean of Academic Affairs	NTRP A143	(940) 565-4203
Dr. Bill Buckles	Associate Dean of Research	NTRP A144	(940) 565-4302
Dr. Miguel García-Rubio	Associate Dean for Outreach & Public Relations	NTRP A153	(940) 565-2524
John Krumrine	Interim Director of Development	GATE 226C	(940) 565-4851
Jim Byford	Computer Support Manager	NTRP A151	(940) 891-6866
Jana Dean	Assistant to the Dean	NTRP A1	(940) 565-4300
Liz Assaad	Budget Officer	NTRP A150	(940) 565-4263
Otilia Sánchez	Program Project/Grant Writer	NTRP A149	(940) 565-2956
Missie Gray	Administrative Assistant/Receptionist	NTRP A1	(940) 565-4300
Christopher Heiden	Academic Services Assistant Director	NTRP A154 & HH120	(940) 891-6702
Nancy Shaw	Academic Advisor I	HH 120	(940) 565-4201
Liz Musgrove	Academic Advisor I	HH120D	(940) 369-8542
Helen Schenk	Administrative Assistant/Student Advising	HH 120	(940) 565-4201
Dan Fried	Student Assistant/Advising Office	HH 120	(940) 565-4201
Caitlin Adams	Student Assistant/Office of the Dean	NTRP A140	(940) 565-4300
Tom Fitzmaurice	2008 Texas BEST Regional Director		(214) 762-7621

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