

USF UNIVERSITY OF
SOUTH FLORIDA
COLLEGE OF ENGINEERING

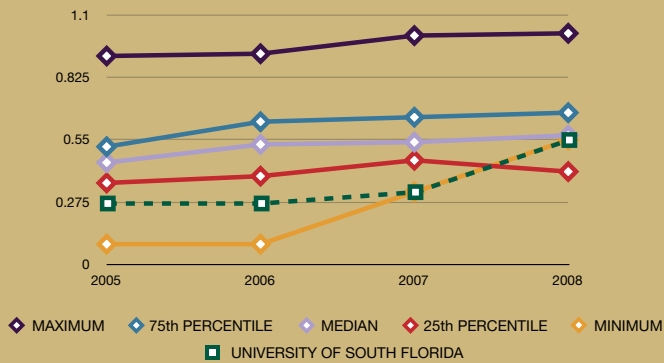


EDUCATION
RESEARCH
OUTREACH

www.eng.usf.edu

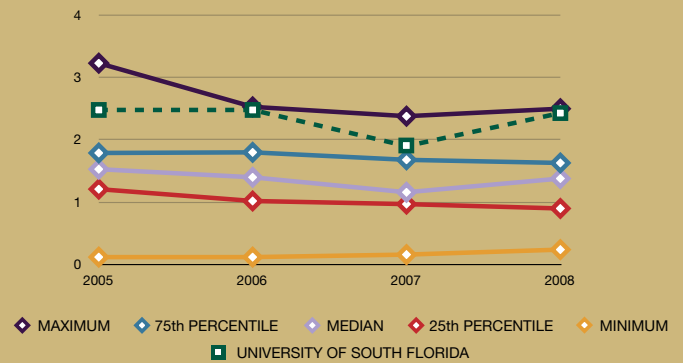
AAU Public Engineering Programs Doctoral Degrees

Doctoral Degrees/Tenure Track Faculty



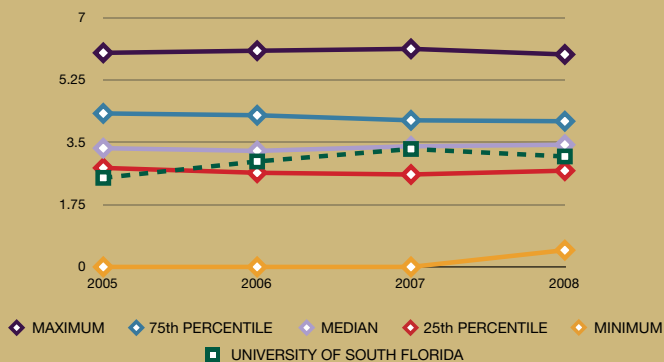
AAU Public Engineering Programs Master's Degrees

Master's Degrees/Tenure Track Faculty



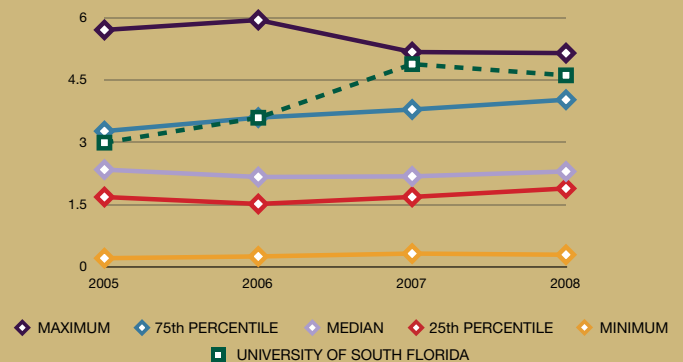
AAU Public Engineering Programs Doctoral Enrollment

Doctoral Enrollment/Tenure Track Faculty



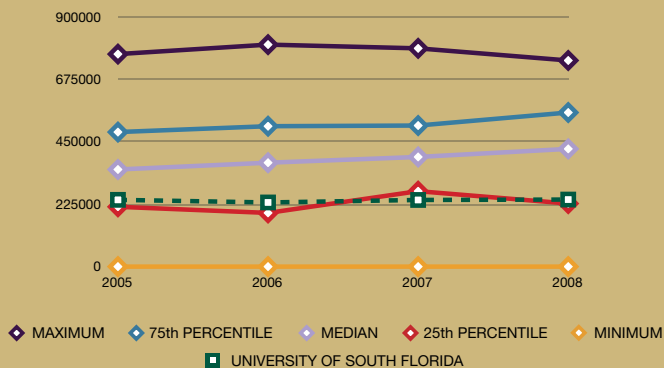
AAU Public Engineering Programs Master's Enrollment

Master's Enrollment/Tenure Track Faculty



AAU Public Engineering Programs Research Expenditures

Research Expenditures/Tenure Track Faculty





Message from the Dean

When I arrived at USF in 2007, things were very different. We have since become more connected to our teaching and core research. We have a strategic plan to strengthen our reputation and perception by our peers and our customers. The past three years have also been a time of self-reflection. As I look around this thriving College and feel its energy, I believe we have much to be grateful for.

The College of Engineering will continue to excel in education and research. At a time when many programs have been eliminated and many universities are plagued with salary cuts and furloughs, the College has increased the number of faculty and graduate students. In fact, 107 doctoral students will start fall semester 2010 as a result of concerted efforts by faculty and staff alike. Additionally, support for graduate students has more than doubled over the last two years. Concomitantly, our collegiate budget is at an all time high. As stated last year, these investments reflect the confidence of the USF leadership (President Judy Genshaft and Provost Ralph Wilcox) in our College of Engineering.

We have been quite successful in our many endeavors but, being a complex system, our ability to grow requires much more than faculty and graduate student salaries. Infrastructure, both hard and soft, is becoming a dominant factor that will enable us to achieve our full potential. Hard infrastructure needs primarily revolve around

space - labs for research, offices for personnel, classrooms for students, etc. Soft infrastructure includes IT support, financial services, support staff in programs and departments, and proper maintenance of our hard infrastructure. While many of these issues are endemic of a larger issue – the current economy for example – we will continue to chip away at them and make forward progress.

We all look forward to continued increases in research productivity and improvement in our undergraduate and graduate degree programs that such investments typically yield. As we take the view far down the road, our path is clear and the skies are bright.

The annual report is framed around our strategic plan and the sections use the major goals of the plan as a framework. The strategic plan is available on the College's website www.eng.usf.edu/.

Dean John Wiencek

“The College of Engineering continues to push itself to excel in education and research.”



University of South Florida College of Engineering Strategic Plan 2008-2013

“We Envision a Great Future”

OUR VISION

By providing a relevant, high quality educational experience for our students and by being a leader in innovative research in the areas of sustainability, renewable energy and biomedical engineering, the College of Engineering aspires to be a peer among engineering programs at research-focused public universities.

OUR MISSION

The Mission of the College of Engineering at the University of South Florida is to improve the quality of life in our community by:

- Providing a high-quality education for our students and practicing professionals.
- Creating new knowledge and solving real world problems via innovative research.
- Engaging in effective community service and outreach.

OUR GOALS

1. Ensure academic and future professional success for our students.
2. Achieve and sustain national recognition in research.
3. Establish essential operational infrastructure to achieve the College’s vision.

OUR VALUES

Through the College’s support and emphasis of these values, we lead by example and pass these attributes on to our students, empowering them to be creative and innovative engineering professionals in the 21st century as their work influences and impacts humanity.

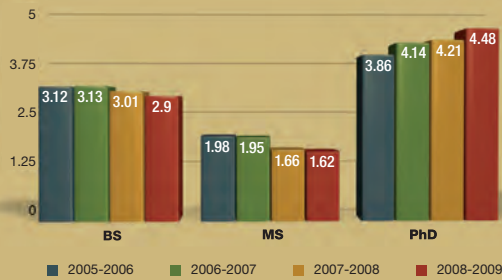
- Student Centric ▪ Collaboration ▪ Collegiality ▪ Commitment to Continuous Improvement
- Innovation ▪ Diversity ▪ Service to Humanity

| National Peer Institutions | Aspirational Peer Institutions |
|--|--|
| University of Cincinnati Rutgers University University of Illinois at Chicago University at Buffalo, SUNY | AAU (Association of American Universities) Public Institutions with Engineering Programs |

GOAL 1

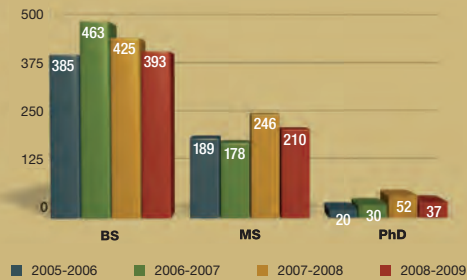
Ensure academic and future professional success for our students

Time to Degree



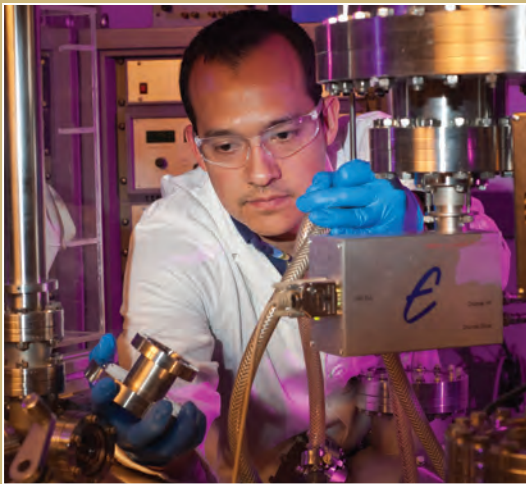
Source: USF Infocenter

Degrees Awarded



Source: USF Infocenter

Research Experiences for Undergraduates



Electrical Engineering Professor Rudy Schlaf's Summer REU program "Preparation and characterization of layered materials back contacts for CdTe solar cells."

Computer Science & Engineering Professor Miguel Labrador's Summer REU program ended with a soccer match with Wireless NXT Robots. Undergraduate Team beat Graduate Team 2-1.



Student and Faculty Success Highlights



Rudy Schlaf



Tapas Das



Geoffrey Okogbaa



Huseyin Arslan

Doctoral students **Praveen Sekhar**, Electrical Engineering, and **Vishnuteja Nanduri**, Industrial & Management Systems, received USF Graduate School 2008-2009 Outstanding Dissertation awards.

Cindy Bethel a summer PhD graduate of the Computer Science & Engineering Department named a 2009 Computing Innovation Fellow and is currently at Yale University.

Pabitra Choudhury, Chemical & Biomedical Engineering, selected by the faculty for the Outstanding Research Assistant for the 2008-2009 year.

Adriana Chacon, Mechanical Engineering senior, awarded first place in the engineering category for best oral presentation during the 17th Annual National Science Foundation (NSF) Florida Georgia Louis Stokes Alliance for Minority Participation (FLGLSAMP) Career Expo.

Sadia Ahmed, a doctoral student under the direction of **Huseyin Arslan**, associate professor of electrical engineering, received a \$36,000 grant from the Veterans Administration for "Home Evaluation of Visual Exit Barriers in Dementia-Related Wandering."

Community Outreach – STEM Grades K-12

Students, Teachers, and Resources in the Sciences (STARS2): A USF/NSF GK-12 Continuation Project

STARS is an NSF-funded GK-12 project directed by industrial engineering professors **Tapas Das** and **Geoffrey Okogbaa** in collaboration with the Hillsborough County School District. The program was initially funded by the Dept. of Graduate Education (DGE) of NSF for \$1.65 Million in 2002. The STARS program received a renewal grant for \$1.6 million in 2007 by NSF after a competitive grant proposal review. The STARS program places USF graduate students from various engineering departments in local elementary schools within the Hillsborough School District to partner with science teachers. The objective of STARS is to develop a unique collaborative model among elementary schools, school district administration, and the University of South Florida to:

- Foster systemic change in elementary curricula with the potential to fundamentally change math, science and long-term professional development of science and mathematics teachers.
- Infuse science and engineering principles as well cutting-edge technology (such as nanotechnology, optics, computer vision, etc.) into the elementary grades curriculum.

College of Engineering Diversity Highlights



Tom Weller



Miguel Labrador



Maya Trotz



Robert Tufts

Three College faculty members – Professor **Tom Weller**, Associate Professor **Miguel Labrador**, Assistant Professor **Maya Trotz** - and staff member **Robert Tufts**, assistant director of the Nanotechnology Research & Education Center (NREC), were recognized for their support of diversity initiatives within the College at USF's seventh annual Diversity Summit.

According to April 5, 2010, issue of *Hispanic Outlook*, the College of Engineering placed 17th in the Top 25 Graduate Schools for Engineering Degrees (MS and PhD combined) and placed 6th in the Top 10 Graduate Schools Awarding Doctoral Degrees in Engineering. (Source: NCES-IOEDS, 2009)

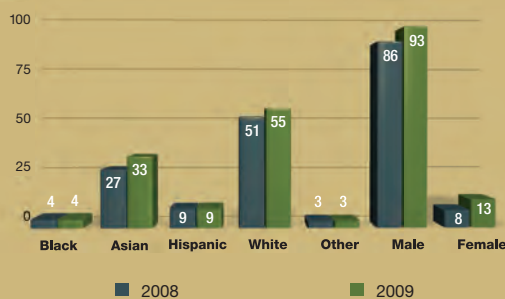
▶ Top 20 schools in the U.S. with Hispanic Tenured / Tenured Track Faculty

(Source: ASEE "Profiles of Engineering & Engineering Technology Colleges" 2009 edition)

▶ Top 50 Engineering Schools in the U.S. for awarding bachelors degrees to women

(Source: ASEE "Profiles of Engineering & Engineering Technology Colleges" 2009 edition)

Diversity Among T/TT Faculty



Fourteen faculty were hired to start the 2009-2010 academic year. Of the 14, four are women, one is Black, six are Asian.

Data from 2009 ASEE Survey

Faculty Highlights



Shekhar Bhansali



Autar Kaw



Scott Campbell



Nagarajan Ranganathan



Vinay Gupta

Shekhar Bhansali, professor of Electrical Engineering received the Sloan Minority PhD Program Faculty Mentor of the Year by the Southern Regional Education Board.

Salvatore Morgera, professor and chair of Electrical Engineering recently designated an *Eminent Engineer* by Tau Beta Pi.

Geoffrey Okogbaa, professor of Industrial & Management Systems Engineering, elected Fellow of the Nigerian Academy of Engineering (Nigeria NAE).

Autar Kaw, professor of Mechanical Engineering, received the 2010 Outstanding Teaching Award from the Southeastern Section of the American Society of Engineering Education (ASEE).

Ralph Fehr, assistant director of the Clean Energy Research Center (CERC) and instructor in the Electrical Engineering Department, named Outstanding Engineering Educator for 2009 by the Florida Council of the Institute of Electrical and Electronics Engineers (IEEE).

Nagarajan Ranganathan, Distinguished University Professor of Computer Science and Engineering, recently received an outstanding undergraduate teaching award at the 2009 Faculty Honors and Awards Reception.

Karen Seggerman, senior research associate with the Center for Urban Transportation (CUTR), awarded FSITE Transportation Professional of the Year.

Thomas Wade, professor of Electrical Engineering named McDonald Mentor by Tau Beta Pi.

Vinay Gupta, professor of Chemical & Biomedical Engineering received the 2009 Jerome Krivanek Distinguished Teacher Award.

Mathematics, Life Sciences & Engineering Partnership

A group of USF science, engineering and mathematics professors received a \$1.57 million NSF-funded project to increase the graduation rate in STEM disciplines. The goal is to increase passing rates in engineering calculus and life science calculus. Collaborators include professors **Scott Campbell** (Chemical Engineering), **Kandethody Ramachandran** (PI), **Catherine Bénéteau**, and **Arcadi Grinshpan** (Mathematics), and professor **Gordon Fox** (Biology).

GOAL 2

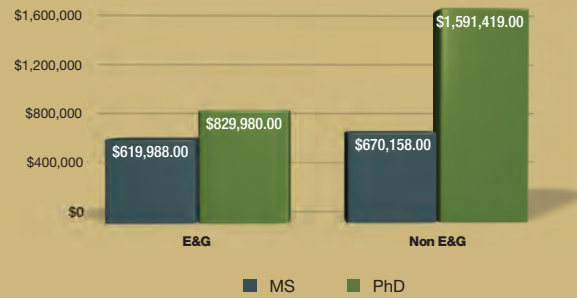
Achieve and sustain national recognition in research

Student Appointments



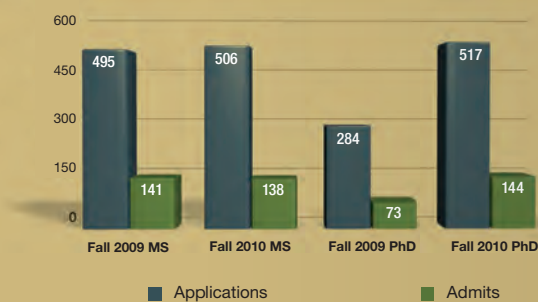
Source: 2009 ASEE Survey

Student Support 2009-2010



Source: FAST

2010 Doctoral Recruitments



Source: USF Graduate School

Applications (517) for doctoral assistantships increased this year 82% through a concentrated, multi-channel marketing effort, resulting in a 97% increase in admitted students (144).

Academic year 2010-2011 will see 107 new doctoral students.

(2010 Data shown is as of 4-5-10.)

Marketing efforts included:

- A dedicated recruitment webpage was created
- Graduate program brochures were created in both electronic and print formats
- An e-mail outreach effort by the Department Chairs and Professors to colleges of engineering at other universities in Florida, the United States and abroad with a link to the website
- Purchased banner ads on the University of Florida and University of Central Florida websites.

Weekly Google Analytics reports for the webpage provided excellent data on visitors to the site and their geographic locations.

College of Engineering Sustainability and Community Outreach Highlights



Civil & Environmental Engineering - International Capstone Design

Undergraduates - Planning and Design of Wastewater Systems in Bolivia.

Linda Phillips and Dennis Magolan, Instructors

Civil & Environmental Engineering "Water Awareness Research and Education in East Tampa"

Interdisciplinary / EPA funding - Project transforms storm water pond areas into community-friendly green spaces. Undergraduates and Graduates work with community organizations, middle and elementary schools, USF School of Architecture and Community Design, and others.

Maya Trotz, Assistant Professor



Peace Corps Master's International Program in Civil & Environmental Engineering

Program incorporates real-world engineering experience defined by sustainability, technology and socio-economic needs and done in-country in Sub-Saharan Africa, Central and South America, and Pacific Rim.

Jim Mihelcic, Professor

USF Biomass Fuel Project Places Fourth in the World at the Global Venture Challenge 2010

A process developed by a team of USF researchers which converts common organic materials such as sawdust, yard clippings and even horse manure into jet fuel placed fourth in the prestigious Global Venture Challenge 2010, second among U.S. teams. The team comprised of chemical engineering professor John T. Wolan, chemical engineering graduate student Syed Ali Gardezi and Jaideep Rajput, a manager in USF's Division of Patents and Licensing and COB graduate student.



Faculty Highlights



Venkat Bhethanabotla



Jay Ligatti



Pei-Sung Lin



Ken Christensen



Jing Wang

Venkat Bhethanabotla, professor and chair of Chemical & Biomedical Engineering received the USF 2009 Outstanding Research Achievement Award. He received NSF funding in 2008 for a biosensor based on these principles to detect ovarian cancer biomarkers and has been actively researching acoustic wave sensors for chemical and biological applications for the past five years. His initial work resulted in a hydrogen sensor technology which was funded by NASA and NSF. The resultant technology has been patented and was licensed by USF in 2007.

Jay Ligatti, assistant professor of Computer Science & Engineering received the USF 2009 Outstanding Research Achievement Award. His research group investigates foundations of computer security.

Florida ITE Newsletter/Magazine Outstanding Paper Award: **Dr. Pei-Sung Lin**, CUTR senior research associate, and **Aldo Fabregas**, CUTR research associate, for their paper, "The Effect of Detection and Communication Failures on Traffic Signal Performance."

37 Engineering Faculty Members inducted as Charter Members into the USF Academy of Inventors.

Ken Christensen, professor of Computer Science & Engineering, received a 2009 Excellence in Innovation Award for his research that has resulted in innovations that reduce energy usage for computers and networks. Professor Christensen's research, funded by NSF for four years and one year by Cisco, includes two key standards adopted by the EPA Energy Star Specification for Computers.

Workforce Training for the Electric Power Sector or Smart Grid. **Lingling Fan**, assistant professor of Electrical Engineering and her research team are one of the collaborating university groups of University of Minnesota's recently awarded \$2.5 million proposal from DOE titled "A Nationwide Consortium of Universities to Revitalize Electric Power Engineering Education by State-of-the-Art Laboratories."

Jing Wang assistant professor of Electrical Engineering and principal investigator in collaboration with **Tom Weller**, professor, associate dean of research and co-PI awarded a \$270,000 three-year NSF grant for collaborative research: "Passive, Diamagnetic Inertial Sensing Integrated with High-Sensitivity Telemetry."

Electrical engineering professors **Tom Weller and Andrew Hoff**, mechanical engineering professor, **Ashok Kumar**, awarded NSF three-year, \$435,000 GOALI collaborative grant for the study of miniature radiometric sensors.

Research Awards Highlights



Rajiv Dubey



Alexander Domijan



Andrés Tejada-Martínez



Daniel Yeh



Amy Stuart

CUTR - Federal Transit Administration \$1,701,875

NBRTI Technical Assistance and Research

Alasdair Cain, Jennifer Flynn, Robert Gregg , Victoria Perk, Cheryl Thole

Rajiv Dubey - Florida Department of Education \$1,459,131

Rehabilitation Engineering and Technology Program

Tennyson Wright

Alexander Domijan - Florida Energy and Climate Commission \$1,422,364

Smart Grid with Renewable Strategic Load Pocket

Andrés Tejada-Martínez- National Science Foundation \$480,000

CAREER: Parameterizations of Langmuir Turbulence in Shallow Water

Jay Ligatti - National Science Foundation \$300,000

CT-ISG: Collaborative Research: Trustworthy Enforcement of Domain-Independent Run-Time Policies

Daniel Yeh - U.S. Green Building Council \$149,525

Integrated Building Water Management (IBWM) Modeling - A Proposed Tool for LEED Assessments and Education

Amy Stuart - National Science Foundation \$160,000

CAREER: Multi-scale interactions of air pollution, urban growth, and equity-integrated research methods and informal science teaching

Spring 2010 Eminent Scholars Lecture Series

Mark Powell, Jet Propulsion Lab and USF graduate, *Innovations and Integrations:*

Applying Trendy Technologies to NASA Mission Operations Planning January 15

Leonard Polizzotto, Draper Labs, *Innovation* January 29

Jerald Schnoor, University of Iowa, *Environmental Grand Challenges* February 12

Norman Augustine, Ret. Chair & CEO Lockheed Martin, *Global Competitiveness* February 26

Mark Somerville, Olin College of Engineering, *Rethinking Engineering Education* March 26

Ramesh Jain, University of California, Irvine, *Emergence, Entrepreneurship and Web* April 12

Goal 3

Establish essential operational infrastructure to achieve the College's vision

Re-engage with Alumni and Advisory Board

Relations with the alumni continue to get stronger through many activities that bring us together – such as athletic events, funding raising events such as Bull-arney, and the Heart of Gold Scholars luncheon, Facebook, receptions, and the Corporate Ambassador Program that engage alumni, donors, faculty, and students.

Working with the director of development, Brett Woods, face-to-face meetings with business leaders are ongoing to re-engage the College to the community and business leaders. Meeting with departmental advisory boards has provided a valuable opportunity to see how the outside views the College and its students. These observations are being documented and will be incorporated into our strategic plan.

The College of Engineering Advisory Board has been re-established. The initial seven members, comprising the Executive Committee, have strong ties to the University and the community. The remaining members of the Advisory Board will be added throughout the year with a goal of 20-25 members. The first full board meeting will be held November 19, 2010. USF President Judy Genshaft will speak.

Participation in USF Comprehensive Campaign



Gene Balter

The College successfully identified and recruited its Campaign Cabinet Representative to represent the College at all USF Unstoppable Campaign meetings and external constituent-events. Gene Balter, PE, '77, President of HDR Construction Control Corporation. In tandem with the Development Office, identification has been made of a number of constituents that Mr. Balter will work with to engage in the life of the College.

The College participated in the public announcement of the Campaign in October via the Unstoppable Showcase. The College featured the Center for Assistive and Rehabilitative Robotics Technologies (CARRT) which drew great interest.

One of three goals set for the College is that of raising funds for a new undergraduate building. Initial discussions have been conducted with the Dean, the College fundraising staff and the Communications Officer to prepare strategy and refine the “case for support” for the new facility.

USF: UNSTOPPABLE

The comparative amount from April 2010 versus same time last year, our YTD fundraising totals \$809,477, making us 29% of Goal for the Campaign.



“USF provided all of the academic and practical tools that a young professional needs to be successful. It was my responsibility to take advantage of my time at USF, and that has resulted in HSA Engineers & Scientists, now 300 strong and located across the street from the university.”

Nick Albergo, BSES, MSCE 86' President and CEO HSA Engineers & Scientists

Greater Focus on Marketing and Public Relations

The College hired its first Communications & Marketing Officer in 2009, fulfilling a strategic goal of 2008-2009. The first year focused on analysis of the past, setting a path to the future, and implementing essential marketing and communications tools whose absence has impacted the College's ability to establish relationships with its varied constituencies. The three most significant projects are featured here - magazine, website, and brand.

Envision Magazine

The College has revitalized its magazine, now named *Envision Magazine* (formerly *USF Engineer* and *The Bridge Builder*), after a four-year hiatus. The twice-yearly publication focuses on departmental research activities, faculty, students, alumni and staff, and other news presented in a creative story format. *Envision* is direct-mailed to 17,000 alumni, friends of the College, and academic peers. It's available electronically on the College's website www.eng.usf.edu.



Branding

The College is developing a brand that represents the innovation, ingenuity and vision of the College's faculty and students. The brand will gain greater presence over time. The art element, a stylized spark representing the six departments symbolizes the energy of the College. The design was created under the direction of Professor Franco Lodato, USF Designer in Residence.



Website

After a seven-month development period that included input from 25 faculty, staff and students, the College recently launched a new website. The project's major goals included a modern design with increased use of color, easy access to information that is well-organized, increased prospective student access to personnel through e-mail, and breaking the stereotype of engineering students. Through a home page video as well as stories of student projects and successes, the site shows engineering majors are many types of students that engage in various activities with energy and plenty of USF spirit.

New Website Home Page



Key Action Items for 2010-11

Going forward, key action items will be defined by our Strategic Plan. The plan provides a framework, but the tactics and operational details must be driving across all units (see action item number one). However, there are clearly some initiatives that must be driven primarily by the Dean's office. Thus, the key action items here are not meant to be all inclusive but, rather, to indicate initiatives that will be of primary concern.

- 1** Develop operational plans across all units to enable the College to make progress toward our vision and to fulfill our mission.
- 2** Continue to build on the initial work of this year's faculty governance council to revisit and update our governance documents to allow a more formal means for shared governance.
- 3** Continue to build relationships with key constituents and to further flesh out our Capital Campaign strategy.
- 4** Continue to engage faculty personally and to build morale.
- 5** Sustain and build on our investment in the College of Engineering PhD programs.
- 6** Manage, in a transparent fashion, our limited physical resources, particularly space.
- 7** Continue to grow our research enterprise, especially in the Biomedical, Sustainability and Renewable Energy research areas.
- 8** Invest in a more robust support service for students seeking meaningful educational experiences outside the classroom such as co-ops, internships, study aboard or REU.

Department of Chemical & Biomedical Engineering



John Kuhn



Richard Gilbert



Mark Jaroszeski



Yogi Goswami



Norma Alcantar

New Faculty Joining the Department

John Kuhn, assistant professor, PhD from The Ohio State University. His research focuses on heterogeneous catalysis and structure, and properties of metal and metal oxide nanoparticles.

Education

Professor **Vinay Gupta** received the USF Outstanding Undergraduate Teaching Award and the USF Jerome Krivanek Distinguished Teacher Award.

The November, 2009 issue of *Chemical and Engineering News* reports our Chemical & Biomedical Engineering Department is the fourth largest producer of master's degrees in the United States.

Professor **Scott Campbell** is part of a team receiving a NSF STEM grant for \$2 million and seeks to reform the Engineering and Life Science Calculus sequences at USF.

Emeritus Professor **Carlos Smith's** third edition textbook "Principles and Practice of Automatic Process Control" was recently translated into Spanish and Portuguese. It is the most used controls book in Latin America and Portugal.

Two of professor **Norma Alcantar's** doctoral students received fellowships: **Eva Williams** received the prestigious Ruth L. Kirschstein National Research Service Award from the National Cancer Institute /National Institutes of Health (NCI/NIH); and **Dawn Fox** received the "Faculty for the Future Fellowship" from the Schlumberger Foundation for the third straight year.

Research

Professors **Venkat Bhethanabotla** and **Ryan Toomey** each received a USF Outstanding Research Achievement Award.

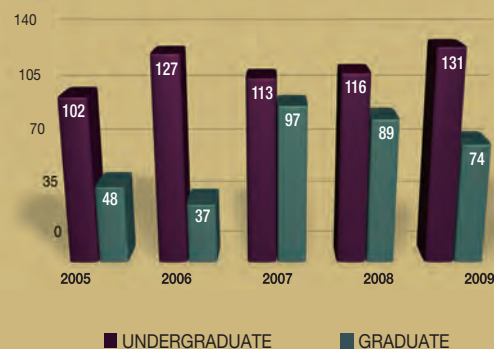
Professor **Mark Jaroszeski** awarded grants for research in "Topical Charge Driven DNA Delivery to Skin" funded by the National Institutes of Health, National Institute of Allergy and Infectious Diseases and a grant for the "Development of Streamed Ion Deposition for Efficient Plasmid DNA Delivery" funded by National Institutes of Health, National Institute of Allergy and Infectious Diseases.

Professor **Yogi Goswami** was awarded a \$3.9M U.S. DOE grant to develop a thermal energy storage system for solar thermal power plants. He was also a co-PI on a hydrogen storage grant from the Florida Hydrogen Initiative also funded by the U.S. DOE.

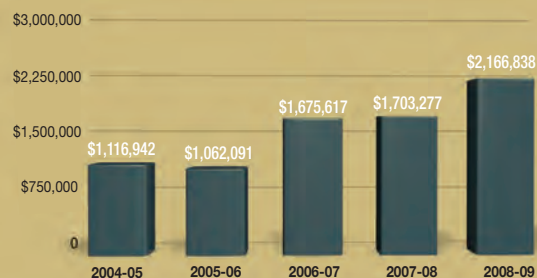
A process developed by a team of USF researchers lead by chemical engineering professor **John T. Wolan** that converts common organic materials such as sawdust, municipal solid waste, yard clippings and even animal manure into diesel and jet fuel placed second in the U.S. at the prestigious Global Venture Challenge 2010 held at Oak Ridge National Laboratory.

CHEMICAL & BIOMEDICAL ENGINEERING DEPARTMENT

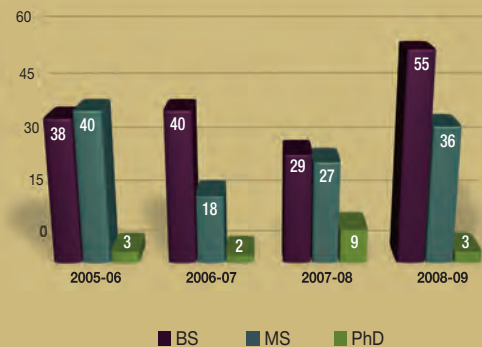
5-year Enrollment Trend



Research Expenditures



Degrees Awarded



Community Service and Outreach

The department, with Professor **Richard Gilbert** as PI, is USF's home for the Florida Advanced Technological Education Center, FLATE (www.fl-ate.org) and the NSF Regional Center of Excellence in the state. One of its targeted goals is to develop statewide outreach best practices that will increase parental awareness and focus pre-college student interest into post-secondary technical and engineering-based programs. To accomplish that goal FLATE has developed a nationally recognized web-site (www.madeinflorida.org) to promote student involvement in education pathways that lead to college and subsequent technical degrees.

FLATE's summer robotics camp program for middle-school develops this activity for statewide distribution accommodating 150 middle-school students, including one camp exclusively for girls. Other outreach activities include high school faculty professional development activities to help emphasize the connections, fun, and importance of science and mathematics within technology and engineering. Some recent activities include: partnering with USF's College of Engineering Nanotechnology Research and Education Center and the Florida High Tech Council in which 25 teachers got an up-close look at the nano world and its tools. Another workshop partnered with an international biotechnology company, Bio-Rad, to advance area teachers' knowledge and skills in biomedical and biotechnology analysis techniques.

Faculty Highlights

Professor **Yogi Goswami** elected to the Pan American Academy of Engineering at a WFEO ceremony Brazil and awarded the Outstanding Professional of the Year for the Federation of Indian Associates (FIA). Professor Goswami also delivered Plenary and Keynote addresses on "New and Emerging Developments in Solar Energy" at the ASME-ATI-UIT Thermal and Environmental Issues in Energy Systems, Sorrento, Italy, May 2010, Solar Future 2010, Istanbul, Turkey, February 2010, and CISBAT Conference, Lausanne, Switzerland, September 2009, and SolarPACES conference, Berlin, Germany, September 2009. He also delivered the Farrington Daniels Award Lecture, Solar World Congress, Johannesburg, South Africa, October 2009.

Professor **Babu Joseph** elected Fellow of the AIChE.

Distinguished professor **Alberto Sagüés** received the NACE International Technical Achievement Award.

Professor **Norma Alcantar**'s research on cactus mucilage was showcased at the BBC-Mundo – Ciencia y Tecnologia in Spanish news, and the Science and Development Network in English.

Department of Civil & Environmental Engineering



Bill Carpenter, Chair



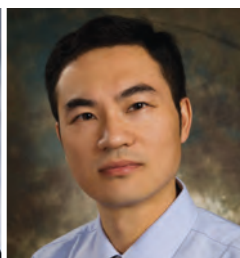
Jim Mihelcic



Sarina Ergas



Qiong (Jane) Zhang



Qing Lu

Civil and Environmental Engineering Overview from the Chair

I am pleased to tell you of the considerable progress the department has made in the last several years in spite of hard economic times. The program has grown significantly, graduating 100 undergrads a year and increasing the number of faculty. Curriculum modifications to better train our students have been put in place and the department's research has expanded to the levels of major research institutions.

The Environmental Engineering program has blossomed over the last five years, adding seven new environmental faculty, and is headed by Professor **Jim Mihelcic**, a *University Outstanding Scholar*. Environmental faculty members are working in the traditional areas of environmental engineering, however, research is growing in the area of sustainability. The department has also added coursework in this area – *Green Engineering for Sustainability*, *Green Infrastructures for Sustainable Communities*, and *Sustainable Development Engineering*. Professor Mihelcic also brought to the department a Peace Corps Master's International program, where students take graduate courses on campus and do their thesis after serving two years in the Peace Corps in foreign countries working on regional problems.

Three new transportation faculty members now give the department additional expertise in aviation and pavement. These faculty, together with professors from the Center for Urban Transportation Research (CUTR), have expanded the graduate course offerings in the transportation area. The impressive list of graduate courses being offered is larger than that found in most universities in the nation and includes courses on planning, economics, modeling, management, aviation transportation, and pavement design and maintenance to mention a few areas.

New Faculty Joining the Department in 2009

Sarina Ergas, assistant professor, PhD from University of California, Davis. Her research focuses on environmental biotechnology: bioremediation, biological air pollution control, water scarcity.

Qiong (Jane) Zhang, assistant professor, PhD from Michigan Technical University. Her research focuses on green engineering and sustainability.

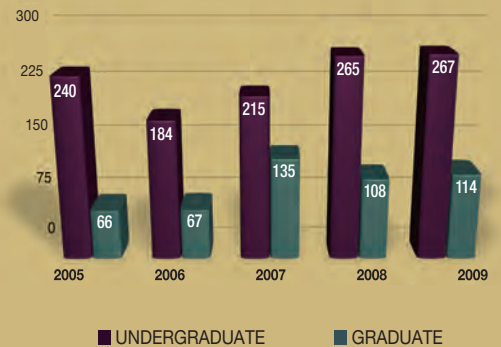
Qing Lu, assistant professor, PhD from University of California, Berkeley. His research focuses on pavement design, transportation infrastructure system management and surface technologies for orthotropic steel-deck bridges.

Education

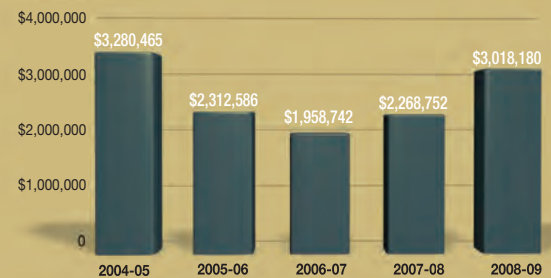
Considerable effort and funds have been invested in improving curriculum and laboratories. The Department has just constructed a state-of-the-art concrete laboratory so that courses such as *Concrete Construction Materials* now have a laboratory component. Also, a major renovation of Geotechnical Engineering Laboratory is underway and a new

CIVIL & ENVIRONMENTAL ENGINEERING DEPARTMENT

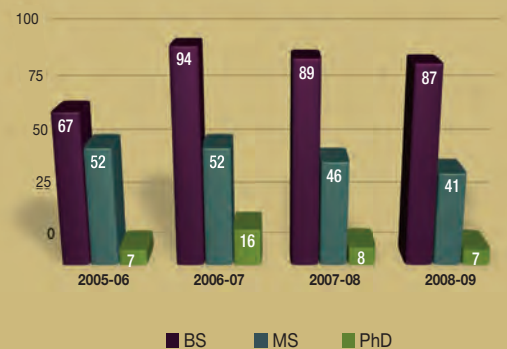
5-year Enrollment Trend



Research Expenditures



Degrees Awarded



Transportation Computations Lab. The Civil Engineering program now contains a two-course sequence in numerical methods and computer tools, and *Engineering Geology* is now a required course. In addition, the department now offers an International Capstone Design experience. This year, a group of students went to Bolivia to work on environmental problems.

Nagesh Nayak, a doctoral student awarded a \$10,000 stipend through the Graduate Research Award Program on Public Sector Aviation Issues sponsored by the Federal Aviation Administration (FAA). Nayak, a student of Professor **Yu Zhang**, is one of only 11 recipients of this award nationwide for the academic year 2009-2010.

Engineering students **Angela Krause** and **Madelyn Rubin** won the FWEA (Florida Water Environment Association, a chapter of the Water Environment Federation) Water/Wastewater Student Design Competition in Orlando. They will head to New Orleans in October to pit their design for a waste water treatment facility in Bolivia up against designs from around the United States.

Faculty Highlights

Andrés Tejada-Martínez, assistant professor, received a \$480,000 National Science Foundation award for his proposal titled CAREER: *Parameterizations of Langmuir Turbulence in Shallow Water*.

Amy Stuart, assistant professor, received a \$160,000 NSF award for her proposal titled CAREER: *Multi-scale interactions of air pollution, urban growth, and equity-integrated research methods and informal science teaching*.

Alberto Sagüés, PE and distinguished university professor of civil and environmental engineering, received a 2010 Technical Achievement Award from the National Association of Corrosion Engineers (NACE) International for his work in corrosion engineering.

Qiong Zhang, assistant professor, awarded a \$163,000 NSF grant for Collaborative Research: *Civil & Environmental Engineering Education (CEEE) Transformational Change Tools and Strategies for Sustainability Integration and Assessment in Engineering*.

Daniel Yeh, assistant professor, awarded a \$150,000 NSF grant IRES: Sustainable Clean Water Technologies for the United Nation's Millennium Development Goals - A Partnership Between UNESCO-IHE (Delft, Netherlands) and the University of South Florida.

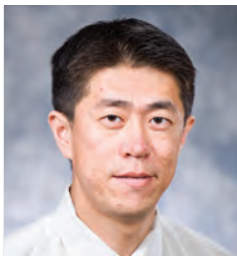
Department of Computer Science & Engineering



Xianing Qian



Luther Palmer, III



Yu Sun



Adriana Iammitchi



Yicheng Tu

Computer Science & Engineering Department Hired Three Promising New Faculty Members in 2009

Xianing Qian, assistant professor, PhD from Yale University. His research focuses on bioinformatics.

Luther Palmer, III, assistant professor, PhD from The Ohio State University. His research focuses on robotics and legged robots.

Yu Sun, assistant professor PhD from University of Utah. His research focuses on robotics and haptics.

Education

Professor **Nagarajan Ranganathan**, distinguished professor, received the USF Outstanding Undergraduate Teaching award.

Associate Professor **Miguel Labrador's** NSF Research Experiences for Undergraduates (REU) summer program for under-represented students is in its fourth year.

Students **Francesco Di Natale**, **Joe Di Natale**, **Jon Mercer**, and **Donald Ray** a senior design group, were selected to present at the Capstone Design Conference in Boulder, Colorado.

John N. Korecki, doctoral student, and his interdisciplinary team received a grant for their project titled: "The Optimal Design of Water Supply Systems for Energy Efficiency in Tampa Bay Area."

Research

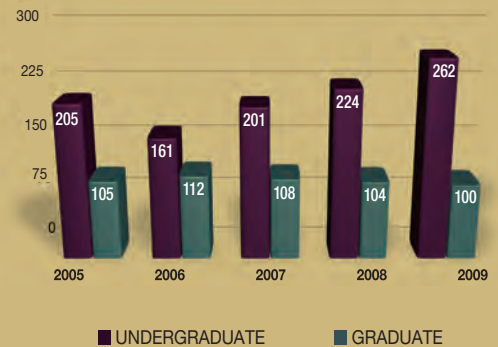
Assistant Professor **Adriana "Anda" Iammitchi** received a National Science Foundation five-year award totaling \$485,000, titled CAREER: "*Socially-Ware Distributed Systems*."

Yicheng Tu (PI) awarded a 5-year R01 grant titled "*Database-centric Data Analysis for Molecular Simulations*" under the administration of the National Institute of General Medical Sciences (NIGMS) at the National Institutes of Health (NIH). This is a collaborative project between Tu's group in CSE and those of Dr. Sagar Pandit from the Department of Physics at USF, and Dr. Xingquan (Hill) Zhu from the Department of Computer Science and Engineering at Florida Atlantic University. The total amount awarded is \$875,262. The project addresses key data management challenges in performing molecular simulations, which is a major computational tool in studying the physical/chemical features of biological systems.

Yu Sun and his collaborator **Sang-Hie Le** have received funding for the proposal titled "*Robotics Modeling of Skilled Hand Tasks*" under the USF Neuroscience Collaborative Grant Awards program for \$100,000. The grant extends over a

COMPUTER SCIENCE & ENGINEERING DEPARTMENT

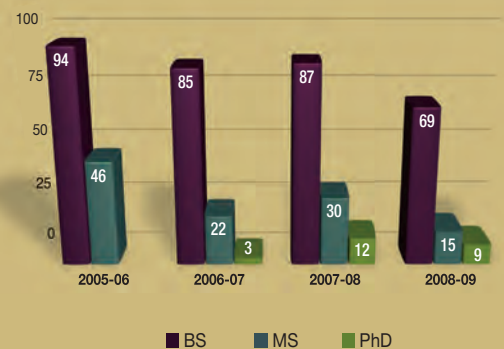
5-year Enrollment Trend



Research Expenditures



Degrees Awarded



period of two years.

Professors **Dmitry Goldgof** and **Larry Hall** received the first year of funding of a five-year grant with Bob Gillies, PhD, PI, and Bob Gatenby, MD at the Moffitt Cancer Center. The \$95,000 subaward is part of a \$2.98M, five-year grant to study the “*Radiomics of Non-Small Cell Lung Cancer*.” This research brings together CT and PET imaging with microarray analysis to study lung cancer tumors and categorize them by type and aggressiveness toward maximally effect treatments.

Jay Ligatti, assistant professor, received a USF 2009 Outstanding Research Achievement Award. His research group investigates the foundations of computer security.

Professor **Ken Christensen** received the USF Excellence in Innovation Award.

Professor **Sudeep Sarkar** selected IEEE Computer Society Distinguished Visitor and Elected IEEE PAMI TC Chair.

Cindy Bethel, PhD graduate, named 2009 Computing Innovation Fellow by the Computing Community Consortium and the Computing Research Association.

Nagarajan Ranganathan received the 2009 IEEE Circuits and Systems Society VLSI Transactions Best Paper award for the paper “*A Fuzzy Optimization Approach for Variation Aware Power Minimization During Gate Sizing*,” IEEE Trans. on VLSI Systems, vol. 16, pp. 3571-3581, Aug. 2008, by V. Mahalingam, N. Ranganathan, and J. E. Harlow.

Nagarajan Ranganathan named distinguished alumnus of the National Institute of Technology, Trichy, India.

Assistant Professor **Hao Zheng**, principal investigator in collaboration with professor Chris Myers of the University of Utah received a \$530,000 three-year National Science Foundation (NSF) grant to investigate and develop methods and tools for the analysis and verification of cyber-physical systems.

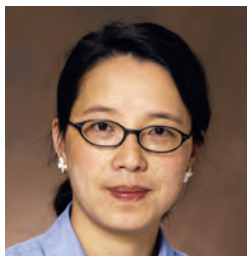
Community Service/ Outreach

A streaming worldwide Tango event, a collaboration between USF Professors **Adriana Iannitchi** (CSE) and **Robert Lawrence** (Art), was held May 1 in at least 20 cities around the world that has annually garnered more attention every year. The event has been described at:

www.tampabay.com/news/humaninterest/couples-stage-a-worldwide-tango/1091969



Department of Electrical Engineering



Lingling Fan



Gokhan Mumcu



Salvatore Morgera



Sylvia Thomas



Sanjukta Bhanja

New Faculty joining in 2009

Lingling Fan, assistant professor, PhD from West Virginia University. Her research focuses on modeling and control of energy systems and smart grids.

Gokhan Mumcu, assistant professor, PhD from The Ohio State University. His research focuses on electromagnetic theory and computational electromagnets.

Sal Morgera, PE, FIEEE, professor and chair, PhD from Brown University. His research focuses on the intersections between communications and medicine.

Message from the Chair

We have injected a great deal of innovation into our programs in response to the needs of our times. Electrical Engineering is rapidly evolving in new dimensions. In today's complex world, Electrical Engineers will become the great enablers and our innovations in Electrical Engineering education and research will help accomplish that objective. This Annual Report provides a snapshot of these efforts.

~ **Sal Morgera**, PE, FIEEE, Professor & Chair

Education and Innovations

Electrical Engineering Leadership Honors Program: A new program designed with industry to provide the skills that engineering leaders of the future will require.

Capstone Design Innovations with common design courses, nanotechnology fabrication facility for experimental design, and annual design themes.

NAE Grand Challenge Scholars: A new program aimed at preparing students to solve the engineering grand challenges as identified by the National Academy of Engineering.

Research Experience for Undergraduates Program: An outstanding program that keeps getting better under the guidance of Professors **Rudy Schlaf** and **Sylvia Thomas**.

Outreach and Community Service with organization such as Engineers Without Borders, IEEE Hardware Design and Robotics Competitions, and International Cooperation Programs.

Outstanding Recent Graduates

Nathan Quecan: Outstanding Electrical Engineering Graduate Spring 2010. IEEE FWCS Engineering Student of the Year 2008-2009. Member of Tau Beta Pi and four other honor societies. Recipient of the prestigious Allan R. Gondeck Memorial Scholarship and seven others.

Joe Register: Member of the USF MEMS research team for four years with three journal publications. Founder of the USF organization X-Labs, created to demonstrate science and engineering to the general public with the primary goal of motivating young students to go into these fields.

Outstanding Graduate Students

Jayita Das: Awarded a USF Presidential Doctoral Fellowship, a very prestigious honor available to new doctoral students with exceptional academic credentials. Her research focuses on nanomagnets and she is a student of Professor **Sanjukta Bhanja**.

Christopher Frewin: Working with Professor **Stephen Sadow**, Chris has been awarded the USF Functional Multiscale Materials by Design (FMMD) Fellowship. He has also helped in obtaining a seed grant award from the Florida Center of Excellence for Biomolecular Identification and Targeted Therapeutics (FCoE-BITT). A provisional patent, based on the results of this work, has been filed with the U.S. Patent and Trademark Office. He was awarded the College of Engineering Interdisciplinary Scholarship Program for fall 2009.

Professional Master's Degree Program – Under Construction!

A 30-credit hour professional master's degree in electrical engineering that can be completed in 10 months on weekends and is specifically tailored for working professionals.

Research

Research Centers and Laboratories

Clean Energy Research Center (CERC)

Power Center for Utility Explorations (PCUE)

Surface Science Laboratory

Interdisciplinary Communications, Networking and
Signal Processing (ICONS)

Center for Wireless and Microwave Information (WAMI) Systems

Wireless Communications and Signal Processing Laboratory (WCSP)

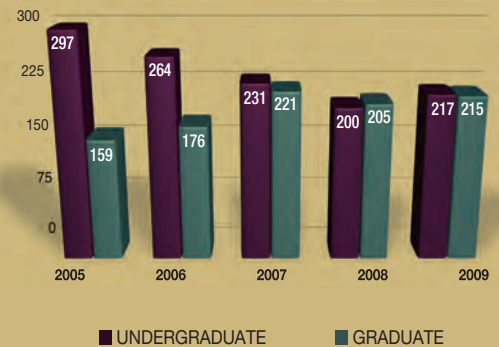
USF SiC Group Laboratory

MEMS Research Laboratory

Research Highlights

- Award of NSF I/UCRC Small Satellite Technology Planning Grant
- \$2.5M DOE/NSF aggregate awards for Power/Energy Research and Education
- \$1.2M NSF/Other agency aggregate awards for MEMS and Nano/Micro Technologies Research
- \$750K NSF/Other agency aggregate awards for Wireless, Microwave, and Antenna Systems Research

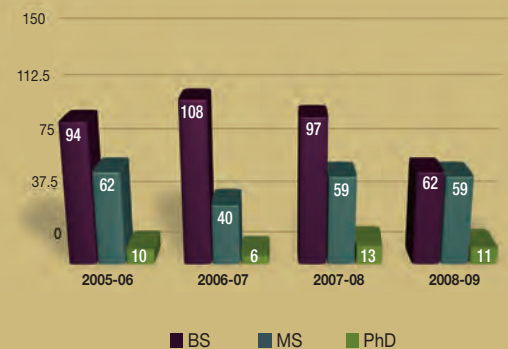
5-year Enrollment Trend



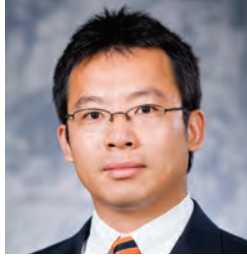
Research Expenditures



Degrees Awarded



Department of Industrial & Management Systems Engineering



Hui Yang



Patricia Zarate



Bo Zeng



Grisselle Centeno



Jose L. Zayas-Castro

New Faculty Joining the Department in 2009

Hui Yang, assistant professor, PhD from Oklahoma State University. His research focuses on data mining, and data-driven nonlinear stochastic modeling and analysis of complex systems toward diagnostic and prognostic applications.

Patricia Zarate, instructor, PhD from University of South Florida. She coordinates the MS in Engineering Management, the Accelerated Graduate and Graduate Certificates Programs. She teaches courses related to lean systems, quality control, statistics, and engineering Economics.

Bo Zeng, assistant professor, PhD from Purdue University. His research focuses on developing solution methods for deterministic and stochastic discrete optimization and computational optimization problems.

Education

PhD Graduates into Academia & Research:

Aldo Fabregas – Research Associate, Center for Urban Transportation Research, USF

Chaitra Gopalappa – Post-Doctoral Fellow, Centers for Disease Control and Prevention, Atlanta, GA

Vishnuteja Nanduri – Assistant Professor, University of Wisconsin-Milwaukee

Luis Otero – Assistant Professor, Florida Institute of Technology, Melbourne

Wilkistar Otieno – Assistant Professor, University of Wisconsin-Milwaukee

Alcides Santander – Assistant Professor, Universidad del Norte, Barranquilla, Colombia

Athanasios Tsalatsanis – Assistant Professor, Department of Internal Medicine, USF College of Medicine

Student Awards

Vishnuteja Nanduri – First place USF Dissertation Award

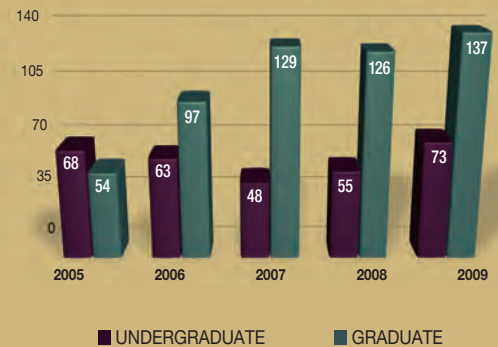
Daniel Rojas – First place USF Master's Thesis

Student Chapters National Awards

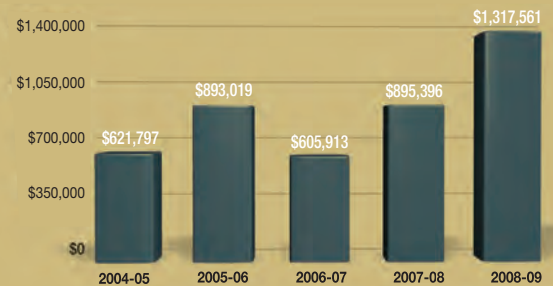
Institute for Operations Research & Management Science (INFORMS) - 2009 Student Chapter Magna Cum Laude Award

Institute of Industrial Engineers - 2009 Student Chapter Merit Award

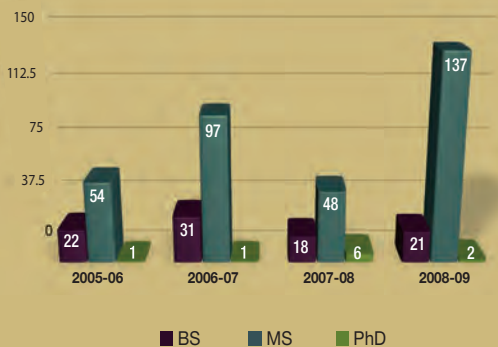
5-year Enrollment Trend



Research Expenditures



Degrees Awarded



Faculty Awards

Associate Professor **Grisselle Centeno** awarded a competitive WIRES travel fellowship held in Barcelona, Spain in June, 2009.

Instructor **Paul Schnitzler** selected as the recipient of the IEEE Region 3 Joseph M. Biedenbach Outstanding Engineering Educator Award.

Associate Professor **Ali Yalcin** awarded a National Academy of Science Fellowship.

Assistant Professor **Hui Yang** received the 2009 IERC Best Paper Award given by the Society of Computer and Information Systems, Institute of Industrial Engineering.

Professor and Chair **Jose L. Zayas-Castro** received 2009 ASEE John L. Imhoff Global Excellence – Industrial Engineering Education and the 2009 Moving Spirit Award as the INFORMS@USF Student Chapter Advisor.

Research

Faculty and students continue to excel in research initiatives and are working on projects that relate to bio-health and healthcare systems, the design, improvement, sustainability and reliability of critical systems such as: energy markets, nanotechnology in manufacturing, and logistics and transportation. Here are some samples:

Enabling nanotechnology and analysis for reliable complex manufacturing systems – **Lai-Yuen, Huang, Okogbaa, and Das.**

Design of reliable business and infrastructure networks and the effective use of resources – **Savachkin, Centeno, Weng, and Zeng.**

Modeling social welfare for the redistribution of carbon revenue – **Das.**

Modeling possible pandemic outbreaks – **Das and Savachkin.**

Networking, organizational collaboration and operational performance – **Reeves and Zayas-Castro.**

Redesigning health care delivery – **Zayas-Castro, Das, Fabri, Centeno, Savachkin, Weng, Yalcin, Yang, and Zeng.**

Using constructivist pedagogical approaches, real-life cases and information technology to enhance student learning – **Centeno, Lai-Yuen, Reeves, and Yalcin.**

Community Service and Outreach

Alfredo Santana and **Laila Cure**, doctoral students, received the 2010 Metropolitan Ministries Ambassador Award for redesigning the layout of food distribution during Thanksgiving and Christmas.

Instructor **Paul Schnitzler** gave a TED (www.ted.com) presentation on how fear and apprehension contribute to failure of leadership in the introduction of change in organizations. To hear Schnitzler's presentation. <http://www.youtube.com/watch?v=KHYuWWhnVOQ>.

Department of Mechanical Engineering



Ajit Mujumdar



Kyle Reed



Delcie Durham



Nathan Crane



Ashok Kumar

New Faculty Joining the Department in 2009

Ajit Mujumdar, lecturer, PhD from the New Jersey Institute of Technology. His research focuses on particle technology: micron to nano scale dry particle coating, mixing and segregation, fluidization, granulation.

Kyle Reed assistant professor, PhD from Northwestern University. His research focuses on rehabilitation engineering, medical robotics, human-robot interaction, and haptic interfaces.

Education

The **Society of Automotive Engineers Student Chapter** had another successful racing season this year, placing 21st overall at the 2010 Baja SAE Carolina event, despite some mechanical problems. USF's Mini Baja team has been international champions twice in the last five years.

The **Student Chapter of American Society of Mechanical Engineers** USF team placed first in the division with an overall first place win in the first Electrathon race of the 2009-2010 season.

Research

New Externally Funded Projects in 2008-2009

Stephanie Carey: Upper Limb Prosthesis and Amputee Tool Kit, funded by James A. Haley Veterans Research and Education Foundation, co-PI **Rajiv Dubey**.

Nathan Crane: *Measuring the Force of Corrosion: A Novel Technique for Corrosion Studies in a Microfluidic Environment*, funded by NACE International. High Yield Self Assembly of Functional Thermoelectric Devices, funded by the National Science Foundation, co-PI **George Nolas**.

Rajiv Dubey: Maximizing Manipulation Capabilities of Persons with Disabilities Using a Smart Wheelchair-Mounted Robotic System, funded by the NSF.

Technology Assessment of Drive-by-Wire Systems: Safe Driving Project-Quality of Life Technology Center, funded by Carnegie Mellon University, co-PI **Stephen Sundarrao**.

Rehabilitation Engineering and Technology Program funded by the Florida Department of Education, co-PI **Tennyson Wright**.

We are ranked in the top 50 U.S. engineering colleges for the most bachelor degrees awarded.

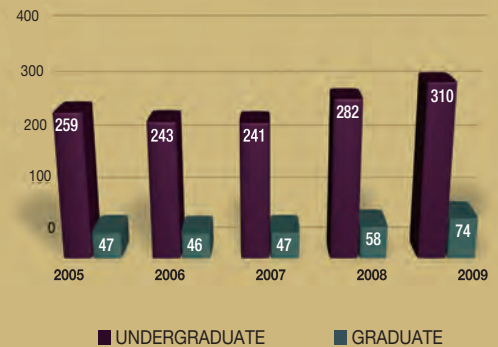
(source ASEE "Profiles of Engineering & Engineering Technology Colleges"

(2009 edition)

The department had a record year (academic year 2009-2010) in terms of new grants totaling just over \$4 million.

MECHANICAL ENGINEERING DEPARTMENT

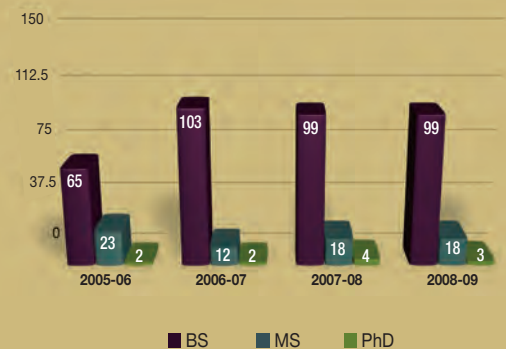
5-year Enrollment Trend



Research Expenditures



Degrees Awarded



Delcie Durham: SGER: *Exploring Sustainable Engineering Design Metrics Through Cell Biology Analogy*, funded by National Science Foundation.

Autar Kaw: Holistic Numerical Methods: Unabridged, funded by the National Science Foundation, co-PI **Sally Coover**, **Melinda Hess**.

Collaborative Research: *Development of New Prototype Tools, and Adaptation and Implementation of Current Resources for a Course in Numerical Methods*, funded by the National Science Foundation.

Ashok Kumar: GOALI: *Study of Reliability and Modeling for Process Optimization and Yield Improvements in Chemical Mechanical Planarization*, funded by the National Science Foundation.

Center for Nanobiotechnology Research (CNBR) funded by the Alabama State University.

Alexei Volinsky: Experimental and Computational Investigation of Fracture Patterns in Thin Films and Multilayers, funded by the National Science Foundation.

Stuart Wilkinson: Developing and Instrumenting a Test Vehicle Mock-up.

Community Service and Outreach

The Center for Assistive and Rehabilitation Robotics Technology (CARRT) was a featured exhibit during the USF: Unstoppable campaign. To see how this dedicated team of researchers improves the quality of life for physically disabled persons, go to the College's home page <http://www.eng.usf.edu>.

Rajiv Dubey, professor and chair received an NSF Grant for the Capstone Design and Rehabilitation Engineering which gives students the opportunity to work on real-world problems in a structured amount of time with industry type to strengthen their job prospects.

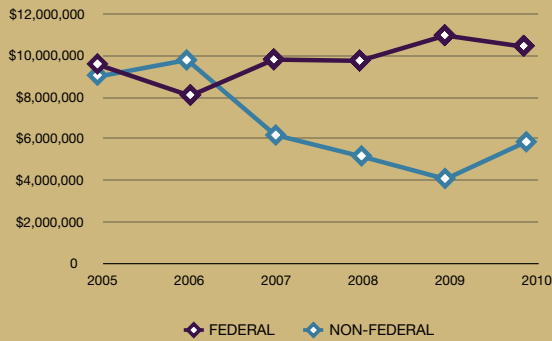
Department Highlights

Adrienne Accardi, a 5-year MS/BS student of Mechanical Engineering has been designated as a NASA Ambassador, a program to engage students in NASA science, technology, engineering and mathematics, research and interactive opportunities.

Sean Motta awarded Student Engineer of the Year by ASME Florida West Coast Section.

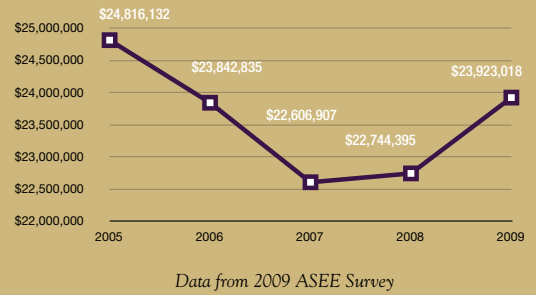
Paul Stevenson named ASME Engineer of the Year. Paul is a graduate of USF's mechanical engineering program.

5-Year Comparison Research Awards 1Q-3Q



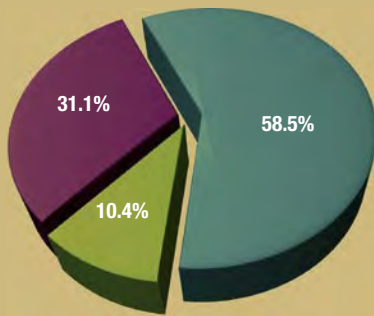
Source: USFof R&I

Research Expenditures by FY



Data from 2009 ASEE Survey

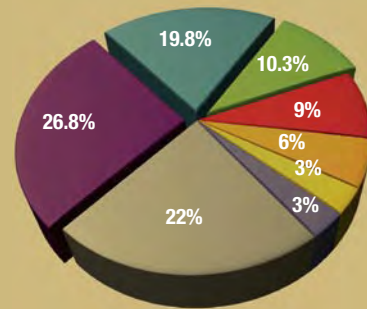
Active Awards 2009-2010



● State/Local Government ● Federal Government ● Private Partnerships

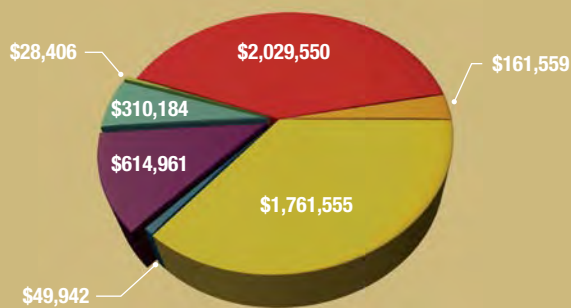
Source: USF Office of R&I

Active Awards by Funding Source



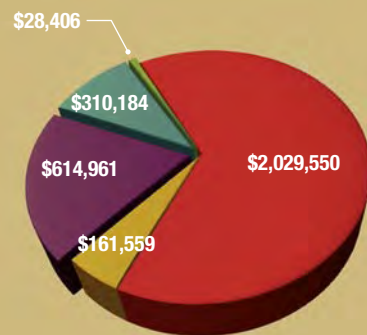
● National Science Foundation ● Florida Department of Transportation
 ● Department of Transportation ● Department of Energy
 ● Federal Transit Administration ● NASA
 ● Department of the Army ● Other

Active Collaborative Awards



● Civil & Environmental Engineering ● Computer Science & Engineering
 ● CUTR ● Electrical Engineering
 ● Engineering Research ● Mechanical Engineering
 ● NREC

Active Interdisciplinary Awards



● Chemical Engineering ● Civil & Environmental Engineering
 ● Electrical Engineering ● Mechanical Engineering
 ● NREC



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