

North Carolina State University
College of Engineering
Annual Report Summary
Covering the period of July 1, 2008, through June 30, 2009

Overview

With 6,161 undergraduates and 2,306 graduate students, the College of Engineering (COE) is the largest college at NC State and one of the largest engineering colleges in the nation. Consisting of 12 highly ranked departments, nine of which are administered in the College, NC State's College of Engineering is a leader in engineering education, research and outreach throughout the state, nation and world.

The long-term goal of the College is "to become the leading public college of engineering in the country and one of the foremost colleges of engineering in the world." Achieving this goal requires significant commitments from the state and the university as well as the College's faculty, staff and alumni.

Even with the economic downturn, 2008-09 proved to be one of the college's most successful years. We welcomed a record number of first year students in 2008. With an average GPA of 4.34 and 55 percent of those admitted in the top 10 percent of their high school graduating class, this was also the strongest first year class in our history.

Support from the North Carolina General Assembly enabled us to grow our faculty with significant new hires in critical interdisciplinary areas of emphasis. Fourteen highly distinguished and talented new faculty members complement our already outstanding faculty, taking our college to even higher levels of achievement. This faculty growth has also spurred an increase in our external contracts and grants as well as our research expenditures, which have increased from \$109 million in 2007-08 to a record \$127 million in 2008-09.

While there have been many contributions to this growth in research activity, a major contributor has been a five-year \$18.5 million grant from the National Science Foundation to establish an Engineering Research Center (ERC) for Future Renewable Electric Energy Delivery and Management (FREEDM) Systems at NC State. This spring the university hosted a groundbreaking ceremony for the new Keystone Centennial Science Center, which will house the new center. Led by Dr. Alex Huang, the NSF FREEDM Systems Center brings together researchers to solve future challenges to our energy grid. We are very proud of this singular accomplishment and confident that it is but one indication of the ability of our outstanding faculty to successfully compete at the very highest levels of federal funding opportunities.

The College has also been successful in attracting federal stimulus funds, including seven awards totaling \$5.9 million for nuclear energy research from the US Department of Energy, the most awarded to

any university for nuclear research during the agency's most recent funding cycle. These awards are indicative of the strong reputation of the College at the national level and represent one of the many ways the College impacts economic development in the state.

Progress on the construction of Engineering Building III (EBIII) led to a celebration of the "topping out" (the placement of the final steel beam on the building) hosted by Skanska on September 30, 2008. When completed in 2010, EBIII will house the Joint NCSU/UNC Department of Biomedical Engineering and the Department of Mechanical and Aerospace Engineering, and more than two-thirds of the College will be located on Centennial Campus. Due to the current economic downturn and the legislative budget cuts, funding for the fourth and fifth engineering buildings on NC State's Centennial Campus is on hold. Support for the design and construction of these buildings remains a priority and is critical to the growth and success of the College and University.

The economic situation also had a negative impact on endowments within the College. As a result, the NC State Engineering Foundation (NCSEF) has encouraged donors to add additional funds to cover the shortfall in scholarships and fellowships supported by endowments. Continued support by our alumni and friends is greatly appreciated and has been critical in maintaining our ability to recruit top students.

Despite the impact of the economic situation has greatly affected the College, the most recent *US News & World Report* show our college held steady at 19th among public colleges of engineering, but our ranking among all colleges of engineering slipped from 30th to 31st. In the Academic Ranking of World Universities (ARWU) in Engineering/Technology and Computer Sciences, we stand at 25th in the world and 11th among public US colleges of engineering. Unlike the *US News* rankings, the ARWU rankings are based solely on hard data and more accurately reflect the true quality of our college.

While the accomplishments and programs described in this annual report summary offer just a snapshot of the various activities within the College, they are indicative of the innovative environment for education, research, service and extension necessary for the success of the College, the University, the State, and the nation.

Undergraduate Programs

The fall 2008 undergraduate enrollment (including biological engineering and textile engineering) of 6161 (1688 freshmen, 1373 sophomores, 1380 juniors, 1740 seniors) represents an increase over the fall 2007 enrollment of 5988. Enrollment of women increased to 961 (15.6 percent) in fall 2008 compared to 914 (15.3 percent) in fall 2007. Enrollment of minority students was 1000 (16.2 percent) in fall 2008 compared to 997 (16.6 percent) in fall 2007. Fall 2008 minority enrollment included 419 African Americans, 382 Asian Americans, 163 Hispanic students, and 36 Native Americans; these numbers include international students. The number of bachelor's degrees awarded for 2007-08 was 1049, compared to 1103 for the 2006-07 year.

Transfer Enrollment and Programs

During the 2008-2009 academic year, 266 students enrolled as transfer students in the College, a 21.5% increase over 2007-08. Of these, 48% transferred from NC community colleges, 23% came from NC four-year institutions, 14% came from out of state, 3% came from international colleges, and 12% came from NC State Lifelong Education.

The College of Engineering continues its 2 + 2 programs with Lenoir Community College, Craven Community College, the University of North Carolina at Asheville, and the University of North Carolina at Wilmington. Of the 266 transfer students, 8 students came from Lenoir Community College, 10 students came from Craven Community College, 2 students came from the University of North Carolina at Asheville, and 16 students came from the University of North Carolina at Wilmington. Three students were accepted from the 3 + 2 program at Elon University.

Undergraduate Recruiting

During spring 2009, six “Spend a Day in Engineering” sessions were offered for freshmen admitted for fall 2009 and their parents. One of these events took place during the finalists’ weekend for Park Scholarship nominees and was offered specifically for these students. Approximately 325 students and 800 parents attended the visitation days. Engineering Open House in April 2009 drew approximately 1,500 admitted and prospective high school, middle school, and community college students plus parents. Overall attendance was around 4,500.

Engineering Summer Programs continued its successful high school engineering orientation program through eight specialized workshops (aerospace engineering, autonomous robotics, Wolfpack Motorsports, civil engineering, chemical engineering, computer science, materials science and a new workshop in biological engineering). During three one-week sessions, 300 students participated in specialized departmental experiences. Approximately 17% of the participants in the summer program were women students, and 18% were minority students.

In fall 2008, regional receptions for prospective students and parents were held in Greensboro, Winston-Salem, Hickory, Charlotte, Wilmington and Raleigh. More than 1,200 students and parents participated in these events.

First Year Engineering Program

In the fall 2008 semester, 1,370 new freshman students entered the College. On average, the cohort admissions statistics indicated the range of SAT of 1170-1350, an HSGPA of 3.80-4.40 (weighted) and was ranked in the top 9-12% of their high school class. During New Student Orientation, over 98% of the students participated in one of the four, day and a half College of Engineering sessions. Highlights of the students’ first semester included the 8th annual College of Engineering Welcome, which was sponsored

by Praxair and featured Praxair CEO, Steve Angel as guest speaker, and the 9th annual Freshman Engineering Design Day.

Throughout 2008-09, the First Year Engineering Program provided academic advising for over 1700 students across 12 departments and 18 degree programs. From this group, 525 students (235 returning; 290 freshmen) were general Engineering Unmatriculated (EU), and 214 were Transfer Unmatriculated (TRU) students.

Engineering Ambassadors

During 2008-09, there were 37 Engineering Ambassadors. All were undergraduate student leaders in at least one of our 18 engineering degrees. Many were Park or Caldwell Scholars, participated in the University Scholars Program or national scholarship competitions, formerly served in a leadership role in one of the student organizations throughout the College of Engineering, and had corporate, international, or research experience.

International Program in Engineering

The College continued its commitment to developing highly qualified engineering professionals who will be competitive and successful in the global economy. Evidence of this includes the continuation of the highly successful Summer in Segovia (Spain) and Zhejiang (China) programs, the two-semester program in Brazil (FIPSE Grant), creation of the Nanjing (China) Civil Engineering Program, the faculty-led experience in Chile for Paper Science and Engineering students, and continued partnership with Monterrey Tec (Mexico) via the UNC-Exchange Programs. Active participation on the NC State International Operations Council (IOC), Committee on International Programs (CIP), and an increase in scholarship funds to study abroad students and programs were essential components. In addition, the International Certificate challenges interested engineering students to expand their global awareness.

The International Program in Engineering experienced continued growth in 2008-09. The continued demand for the German second major for engineers, the creation of the Nanjing Civil Engineering program, and the election of a College faculty member as Chair of the University Standing Committee on International Program were a few of the highlights. Many advisory boards (including Mexico, Africa, India, Brazil, etc.) have been attended by our faculty, and a number of delegations (Mexico, Korea, Taiwan, Chili, India, China, etc.) have been received. More information can be found on the International Program website: <http://www.engr.ncsu.edu/international>

Engineering Career Fair

The College of Engineering hosted the two largest Engineering Career Fairs in NC State history on September 30 and October 1, 2008, and February 4 and 5, 2009. The NC State Engineering Career Fairs are among the largest and best-attended in the nation, hosting 347 companies in the fall and 246 companies in the spring. During the two events, more than 1,500 recruiters met with more than 8,900

students. The Engineering Career Fair has experienced such growth that the bi-annual event became a two-day event held in the fall and spring in 2008; however, due to the economic downturn, the event will be held only one day each semester during the 2009-10 academic year with events scheduled for October 6, 2009, and February 3, 2010, at the McKimmon Center.

Women in Engineering and K-12 Outreach Programs

The Women in Engineering and Outreach Programs grew yet again in coverage and focus this year. The program was recognized by Women in Engineering ProActive Network (WEPAN) with an Outstanding Program Award. In addition, the director, Dr. Laura Bottomley, was recognized by being named to the YWCA Academy of Women for her contributions to Supporting Minorities and Empowering Women in science and technology.

During 2008-09 mentoring for female first year students continued. The “Passport to Engineering” fair event was held for female students and used international examples to illustrate the various engineering disciplines. The WISE program continued to expand and is discussed below. Personal contact continues to be an important part of recruiting of female students, and the percentage has again increased for next year, possibly to the highest in several years. In August 2008, ESCAPE to Engineering, a new bridge program for female students, was held with 40 incoming female students attending a week of activities. Assessment of the camp shows that these students were retained and outperformed their peers for their first two semesters of college. This camp has been funded for August 2009 by additional donations from John Deere and Progress Energy.

The “Engineering on the Road” outreach activity served over 3,000 students statewide. Work continued on the two major grants, \$2 million from the National Science Foundation and \$500,000 from the GE Foundation. These grants provide support for efforts to increase the number and diversity of students in Wake County schools entering algebra by eighth grade and calculus by twelfth grade. Work also continued on the Student Science Enrichment Program grant from the Burroughs Wellcome Foundation. In addition, as a designated training site for the Boston Museum of Science Engineering is Elementary curriculum for the state of North Carolina, staff offered four teacher workshops on this curriculum. We worked with an elementary school in New Hanover County to reinvent themselves as an elementary engineering magnet school and started work with Brentwood Elementary school in Wake County to do the same.

Engineering camps (one week for teachers, one week for students) continue to be a great success. In summer 2008, almost 200 students from across the state, and a few from out of state, attended one of three weeklong camps for third through eighth graders. An additional two camps were offered in collaboration with our 2+2 program at Havelock and Rocky Mount for approximately 100 more students.

The K-12 Outreach program continued to reach out to NC State alumni. Through working with the Engineering Foundation a cadre of alumni interested in outreach was assembled and seminars were offered at every recruiting reception, training approximately 40 additional alumni.

Staff collaborated with members of the College of Education to plan programs allowing education students to take engineering-oriented classes and engineering students to become certified to teach. The staff submitted two National Science Foundation proposals, one NIH proposal and one congressional appropriation request.

Women in Science and Engineering

The 2008-2009 academic year was another big year for WISE with the program serving approximately 270 new and returning students and 14 resident mentors to help the 197 new students.

A leadership conference for the WISE women, co-sponsored by the Women's Center, was held on Saturday, January 31, 2009, and featured Dr. Jo-Ann Cohen as the keynote speaker. Other sessions included "Leading from your heart" by Stephanie Kelber in Training and Development in Human Resources, and "Making the most of your career resources/resume writing" by Ashley Hansen and Linh Nguyen, students from the career center. This event was attended by more than 30 WISE students. WISE, in conjunction with the Women's Center, will continue offering this program and possibly expand it for next year.

In the second year of its implementation, the Sophomore Experience was expanded. Additional programs for sophomores were provided each month and included both academic and social programs especially designed to meet the needs of the second year students in WISE. Sophomores also met one-on-one at least once with the WISE director and/or sophomore experience coordinator. Sophomores choose year-long projects related to research, leadership and service. Eight students presented a poster about their project during the end of year dessert celebration in April. There were at least seven Sophomore Experience Programs held this year, including programs on undergraduate research, resume writing, internships and job opportunities, sophomore project meetings, as well as several sophomore socials.

Benjamin Franklin Scholars Program

The Benjamin Franklin Scholars program is a dual-degree program offered jointly by the College of Engineering and the College of Humanities and Social Sciences. All fall 2008 incoming freshman engineering students with a total SAT score of 1350 and a verbal SAT score of 650 were invited to apply for the program. From this group, 33 new scholars, the largest entering class in the program's history, joined the 19th cohort of the Franklin Scholars program in fall 2008. Franklin Scholars performed over 129 hours of community service this year including such activities as Food Bank, Habitat for Humanity, and Warmth for Wake. This year's Capstone course focused on the technical and social aspects of household energy reduction, which included having students interact with a panel of citizens who

provided their own input on the subject. Nine Franklin Scholars graduated during 2008-09, bringing the total number of program graduates to over 100. The total number of participants in the program as of May 2009 was approximately 50.

Undergraduate Engineering Cooperative Education Program

Co-op made a total of 611 placements in 2008-09. New enrollment was 213. Enrollment of women decreased from 15% to 10%, and minority enrollment increased from 17% to 19%. Minority enrollment consisted of 28 African American, 11 Hispanic, 1 Native American and 50 Asian students. Among the engineering graduates, 86 students were awarded Co-op certificates this year. Co-op engineering students had an average grade point average of 3.27 and earned an average salary of \$17.24 per hour for the first work session.

Bachelor of Science in Engineering (BSE) – Mechatronics Concentration

The BSE-Mechatronics Concentration is a degree-related extension program offered at UNC-Asheville. During the 2007-08 academic years, this program, in conjunction with the 2+2 Engineering Program at UNC-A and the joint degree mechatronics program, generated 878 NC State undergraduate student semester credit hours (SCHs).

BSE Mechatronics Joint Degree Program with UNC-Asheville

The NC State BSE-Mechatronics program at UNC-A became a joint degree program between the two institutions in 2004. At present there are 50 students in the new program. In the spring 2009 semester, the first three students graduated with the joint engineering degree from UNC-A and NC State.

Minority Engineering Programs

During the 2008-09 academic year, activities and models developed within Minority Engineering Programs (MEP) continue to sustain NC State's national prominence as a premier producer of minority engineering graduates. The program continues to receive requests from national and international conference organizers to peer review conference papers, and annual service on research and human resources development panels at the National Science Foundation have continued. Also the director, Dr. Tony Mitchell, is serving as conference awards committee chairman for the 2009 Frontiers in Education Conference to be held this fall in San Antonio, Texas, and was recently elected to a two-year term as vice president of the IEEE Education Society.

The Minority Engineering Program National Advisory Board convened during the fall 2008 semester with representatives from 14 companies, along with chapter presidents of two of NC State's minority student organizations (AISES and NSBE) and one prospective company attended the meeting.

The Summer Transition Program (STP) is a major minority engineering student recruiting program that brings new students to campus during the second summer session before fall of their freshman year.

STP is partially funded through foundation grants, corporate donations and university support. For the summer 2008 STP, 267 admitted minority freshmen were invited to apply, and corporate donations allowed us to expand beyond the minimum of 35 STP participants and accommodate all 60 who applied. For this year's program, STP participants, staff and MEP staff were treated to an all expense paid visit to the Northrop Grumman Shipbuilding facility in Newport News, Va., courtesy of Northrop Grumman. Participants received a small incentive scholarship for successfully completing STP, and all 60 of the participants enrolled in the College in fall 2008. Members of the MEP National Advisory Board donated \$43,000 towards STP 2008. These donations were commitments made by board members to help ensure we continue to host STP and allowed us to expand participation beyond the minimum 35 needed for an effective program.

The Overnight Recruitment Weekend is geared towards admitted students who are interested in learning more about the NC State campus and the rigors of completing an engineering degree. When timing permits, the weekend is held in conjunction with the Office of Undergraduate Admissions' African American Visitations Day. Otherwise, a spring weekend is selected that best fits the spring engineering calendar. During March 2009, 37 (10 females, 27 males), prospective students along with 69 family guests participated in this event. Of the 36 participants, 27 paid enrollment deposits for the 2009-2010 school year, indicating their intent to join our College of Engineering this fall. Thirty (9 females, 21 males) current minority engineering students served as hosts for the 37 prospective students.

Student Advancement and Retention Teams (START) is the College's peer-mentoring program designed to get minority engineering freshmen off to a good college "start." For the fall 2008 semester, 24 upper class minority engineering students served as mentors to 146 minority engineering freshmen. Twenty-one mentors served as mentors to the same population for the spring 2009 semester.

For this reporting year, four sections of E144 – Academic and Professional Preparation I, were available to the 146 incoming minority engineering freshmen with 123 students actually enrolling in the fall course. E144 is specifically designed to help minority engineering students become better acclimated to campus and the College. Thirty-three minority engineering freshmen continued with the second course in the spring: E145 – Academic and Professional Preparation II. This two-semester course sequence remains a key component of the teaching and mentoring responsibilities of the director and assistant director of Minority Engineering Programs. Several MEP National Advisory Board members made class presentations and conducted mock interviews with the 33 students enrolled in E145. Involvement with these freshman level courses is just one of several ways the MEP Board is active throughout the school year.

Scholarships

During the 2008-09 academic year, the College of Engineering awarded 800 scholarships for a total value of \$2,312,849. The selection criteria for scholarship awards include academic achievement, established financial need, and other relevant considerations.

Funding for these scholarships is provided largely by private or corporate contributions to the NC State Engineering Foundation. The College of Engineering Freshman Scholarship Committee awards to incoming freshmen or transfer students included the Engineering Foundation Merit Scholarships (86), Engineering Foundation Merit Scholarships for Transfer Students (5), and the Clarence M. Smith, Jr. Scholarships (18).

In addition to those scholarships awarded and administered by the College of Engineering, other major sources of scholarships for engineering students were the Office of Scholarships and Financial Aid, Park Scholarship Program, National Action Council for Minorities in Engineering (NACME), and the National Science Foundation grant that provides Computer Science, Engineering and Mathematics Scholarships (CSEMS) to our undergraduate transfer students. For this past year, eleven NACME scholarships valued at \$25,885 were awarded to continuing scholars. Awards were made under CSEMS, new and continuing scholars for a total value of approximately \$182,124. NACME provided \$40,000 in new scholarship awards for the 2008-2009 academic year.

The Office of Scholarships and Financial Aid awarded 321 merit scholarships for a total of \$1,808,378 to students enrolled in the College of Engineering. This total includes 56 full-funded Park Scholarships (four-year, renewable, valued at \$75,000 for in-state students and \$130,000 for out-of-state students, for a total of \$937,606), 19 Caldwell Fellows Scholarships (for a total of \$74,000), 54 Chancellor's Leadership Scholarships (for a total of \$226,703), 46 national merit awards (college-sponsored, corporate-sponsored, national finalists, and others for a total of \$65,000), and 146 university-funded merit scholarships (for a total of \$505,069).

In 2008-09, from all sources, engineering students were awarded 1121 scholarships with a combined value of \$4,161,227.

NSF Bridge to Doctorate Grant

NSF has awarded a two-year, \$987,000 Bridge to the Doctorate grant to NC State University, effective fall 2008. The Bridge to the Doctorate Program seeks to facilitate the successful completion of a graduate degree for students who plan to pursue a doctoral degree in a STEM field. The program provides support for up to two years. Fellows are eligible to receive a \$30,000 annual stipend per year (12 months), graduate school tuition and normal fees, medical insurance, and travel support to professional development activities.

An original paper titled "On Successful Implementation of an NSF-Funded Bridge to the Doctorate Program in STEM Disciplines," will be presented at the 2009 ASEE Annual Conference in Austin, Texas.

Graduate Programs

Graduate student enrollment in the College of Engineering for fall 2008 was 2,306 (1332 master's and 974 doctoral) compared to 2,125 in fall 2007 (1187 master's and 938 doctoral). This includes students enrolled in Biological and Agricultural Engineering (BAE) and Textile Engineering (TE). It also includes enrollment for the off-campus Master of Engineering degree, which totals 87. International students made up 53 percent (1226 students) of the enrollment; 21 percent (484) of the students were women. Minority enrollment was 8 percent (187 students: Asian American 92, African American 54, Native American 5, Hispanic 36).

The number of graduate degrees awarded during 2008-09 was 615 (501 master's degrees and 114 doctoral degrees), which includes eight master's degrees and three PhD degrees in Biological and Agricultural Engineering and four master's degrees in Textile Engineering. In 2007-08, there were 585 degrees awarded.

The Engineering Foundation provides a \$30,000 budget to bring outstanding graduate students to the campus for personal interviews. Of the 110 students who visited the campus, approximately half are expected to enroll. The Directors of Graduate Programs encourage continuation of the activity.

Dean's Fellowships

The Dean's Fellowships provide funds for high-quality graduate students. For the 2008-09 year, there were 59 new fellowships and 14 carryover fellowships from 07-08 for a total of 73 Dean's fellowships with values of \$2,500 non-renewable (5), \$5,000 non-renewable (31), \$10,000 non-renewable (6), \$2,500 renewable (7), \$5,000 renewable (4), and \$10,000 renewable (6). In 2006 the College implemented new procedures for Dean's fellowships by awarding both single- and multi-year fellowships to help increase enrollment. Due to budget restrictions this practice and the \$10,000 Dean's Fellowship have been eliminated. For 2009-10, there will be 45 new fellowships and 13 carryover fellowships from 08-09 for a total of 58 Dean's fellowships with values of \$10,000 non-renewable (6), \$5,000 non-renewable (12) and \$2,500 non-renewable (40). The total package for an out-of-state student will be approximately \$40,659.

GEM Consortium

The College of Engineering is a member of the GEM Consortium, which provides opportunities for minority students to obtain a master's and PhD degrees in engineering through a program of paid summer engineering internship and financial aid. Recipients of the awards receive tuition, fees and a stipend of approximately \$6,666 per academic year for master's degree students and \$14,000 for PhD students. The summer internship brings the total award value to between \$15,000 and \$30,000. For 2008-09, the College matched the \$6,666 GEM fellow stipend for those students who did not have an assistantship and agreed to support PhD students' years 2-5.

Mentored Teaching Assistantship Program

The College continued to support the Mentored Teaching Assistantship program. The goal of the program is to provide engineering graduate students with an opportunity to gain teaching experience beyond that of a regular teaching assistant prior to entering an academic career. The students receive an additional \$150 per month beyond their teaching assistant stipend.

Graduate Assistance in Areas of National Need

The US Department of Education Graduate Assistance in Areas of National Need (GAANN) Fellowship Program supports graduate students who are pursuing PhDs in the areas of biotechnology, computational science and electronic materials. A total of seven GAANN fellowships were awarded to our graduate students in 2008-09. The seven GAANN fellowships were distributed as follows: five in chemical engineering, one in biomedical engineering, one in mechanical and aerospace engineering, and one in materials science and engineering. The average annual stipend for GAANN was \$21,975 including tuition, fees and health insurance. With funding provided by the Department of Education, the Graduate School and the College of Engineering.

NSF Graduate Research Fellowships

Seven students received NSF Graduate Research Fellowships with stipends of \$30,000 plus tuition, fees, and health insurance. For the purposes of this summary, a list of other fellowships received this year is included in Appendix A.

Graduate Student Support Plan

The University implemented a new student support plan in fall 1997. Colleges are given slots allowing full-time (with some exceptions) students who are supported with \$3,000 per semester (or \$8,000 per year annualized) with nine or more hours to receive out-of-state tuition, in-state tuition, and health insurance. As of April 26, 2009, the GSSP provided tuition remission slots for 567 graduate students valued at \$3.1 million. This included 78 slots, valued at \$472,000 provided through the College matching requirement; these were matched by the Graduate School providing a total of 515 slots. Funds were available to cover all requests for students who were eligible during 2008-09.

Distance Education Programs

The distance education programs within the College of Engineering include both undergraduate and graduate courses and degree programs and non-credit professional development courses. Undergraduate courses are offered as part of the Computer Programming Certificate or as part of site-based 2+2 and BSE programs in North Carolina. The Computer Programming Certificate is designed for individuals who wish to upgrade their programming skills and/or develop the background needed to pursue a graduate degree in computer science.

Undergraduate 2+2 programs are offered on the campuses of UNC-Asheville, UNC-Wilmington, Lenoir Community College and Craven Community College-Havelock. Students can complete the first two years of course work before transferring to the Raleigh campus for an undergraduate engineering degree. A complete four-year Bachelor of Science in Engineering (BSE) with a concentration in mechatronics is also available for students in Asheville, and students in southeastern North Carolina can pursue the BSE degree with a concentration in mechanical and aerospace engineering in Havelock.

Four new graduate programs are in the approval process for the online graduate program: the Master of Integrated Manufacturing Systems Engineering, the Master of Industrial Engineering, the Master of Science in Computer Networks and Telecommunications and the Master of Science in Environmental Engineering. More than 80 graduate courses were offered in the fall and spring semesters for students interested in completing one of the ten online graduate degree programs or enrolling in classes for professional development. Individuals from 41 states, Puerto Rico, and six countries participated in the online graduate courses.

Engineering Online had its largest enrollment in graduate courses in its history. *US News and World Report's* survey of online engineering graduate programs listed NC State as the third largest program in the US among the schools surveyed with 660 students registered in the fall semester. Civil Engineering has the largest number of degree-seeking students followed by the Master of Engineering program. A total of 73 online students completed the requirements for their degrees.

Several non-credit courses were developed in partnership with the Industrial Extension Service (IES) for engineers who wanted to fulfill the requirements for their engineer's license or take courses for professional development. The Fundamentals of Engineering review series and the PE review for civil engineers are also available online for professionals who wish to study for these exams. New non-credit certificate programs are being planned for the new academic year.

Faculty and Staff

Of 635 faculty and research staff members, 257 are tenured/tenure-track faculty members (rank of assistant professor or above), 24 are lecturers/instructors, 26 are visiting, 130 are adjunct appointments, and 198 are non-faculty and other EPA staff. *NOTE: These numbers are estimates. Hard data will be reported by August 1 deadline.*

The faculty and staff in the College of Engineering continue to be recognized as leaders among their peers and have received numerous awards and recognitions during 2008-09. The following is a short highlight of awards and honors received during the 2008-09 academic year. A complete list is included in Appendix B.

- Louis A. Martin-Vega, Outstanding Engineer in North Carolina for 2008, North Carolina Society of Engineers
- Linda Krute, 2009 Joseph M. Biedenbach Distinguished Service Award, Continuing Professional Development Division of the American Society for Engineering Education (ASEE)
- Troy Nagle, Alexander Quarles Holladay Medal for Excellence, NC State University
- Joseph DeSimone, Lemelson-MIT Prize for Invention and Innovation
- Christine Grant, 2009 Chemical Council for Research Diversity Award
- Keith Gubbins, Distinguished Visiting Fellow Award, Royal Academy of Engineering (RAE), London
- Carol K. Hall and Joseph DeSimone, “One Hundred Engineers of the Modern Era,” American Institute of Chemical Engineers
- Sheila Hayes, 2009 Award for Excellence, NC State University
- Sami H. Rizkalla, Joe W. Kelly Award, American Concrete Institute, 2008
- Laurie Williams, “25th Anniversary Top Pick” for full-length peer-reviewed article, Institute of Electrical and Electronics Engineers (IEEE)
- Nino A. Masnari, Alexander Quarles Holladay Medal for Excellence, NC State University
- Thomas K. Miller, Outstanding Leadership by an Individual in the field of Distance Learning, U.S. Distance Learning Association (USDLA)
- Paul H. Cohen elected chair of IIE Council of Fellows (June 2008)
- Brian Denton, Career Award, National Science Foundation (NSF)
- Mohammed Zikry, 2008-09 Jefferson Science Fellow, U.S. Department of State
- Robin Gardner, 2009 Arthur Holly Compton Award, American Nuclear Society

Research

The College of Engineering faculty in 2008-2009 were very successful in receiving awards for research. During the period July 1, 2008, through June 30, 2009, the college received 504 **awards totaling \$57,113.224**. Another important productivity factor for research is the total research expenditures, which for 2008-2009 was approximately, \$47,083,730. These figures include only federal, state, and industry from outside contract and grant accounts; they also exclude the Textile Engineering and Biological and Agricultural Engineering portions of engineering expenditures. The figure for total research expenditures from all sources for 2008-2009 is approximately **\$127,448,120**, an increase of approximately 5.0 percent over the previous year.

The College had 10 US patent applications and 2 foreign patent applications filed during the 2008-2009 fiscal year.

The College of Engineering ranks 17th in the nation in research expenditures and 14th in the nation in industry support, among all engineering colleges according to ASEE in 2008.

Among the more significant renewed or new contract awards for 2008-2009 were:

- Huang, Alex, \$3,249,975 from National Science Foundation, for “Distribution and Management (FREEDM) Systems.”
- Lester James, \$1,868,615 from National Science Foundation, for “R&D: Developing Science Problem Solving Skills and Engagement Through Intelligent Game-Based Learning.”

- List, George, \$1,800,000 from National Academy of Sciences (US Dept. of Transportation), for “Establishing Monitoring Programs For Travel Time Reliability.”
- Hall, Carol, \$1,499,992 from National Science Foundation, for “CDI Type II Computational Discovery of Unusual Nucleic-Acid-Based Nanostructures.”
- Kekas, Dennis, \$1,089,000 from Army Research Office, for “Secure Open Systems Institute.”
- Steer, Michael, \$1,058,800 from Army Research Office, for “Standoff Inverse Analysis and Manipulation of Electronic System”.
- Mitchell, Tony, \$987,000 from NC A&T (NSF), for “North Carolina Louis Stokes Alliance for Minority Participation (NC-LSAMP) Proposal to the National Science Foundation (Solicitation NSF 08-545) to Fund Cohort VI of the “Bridge to the Doctorate” Program at North Carolina State University.”
- Peretti, Steven, \$984,000 from US Dept. of Energy, for “Center for Integrated Biomass Research.”
- Parsons, Gregory, \$984,000 from US Dept. of Energy, for “Nanostructured Materials for Renewable Alternative Energy.”
- Carbonell, Ruben, \$953,448 from UNC-Chapel Hill (National Science Foundation), for “NSF Science and Technology Center for Environmentally Responsible Solvents and Processes.”
- Boulay, Andrew, \$923,435 from National Institute of Standards & Technology (US Dept. of Commerce), for “North Carolina Manufacturing Extension Partnership.”
- Daggerhart, James, \$738,748 from National Institute of Standards & Technology (US Dept. of Commerce), for “North Carolina Manufacturing Extension Partnership.”
- Gardner, Robin, \$649,500 from US Dept. of Energy, for “Development of Accurate and Fast Monte Carlo Spectral Simulation Algorithms For Proliferation Detection.”
- Young, Robert, \$562,723 from National Science Foundation, for “Mathematics Instruction Using Decision Science and Engineering Tools.”
- Daggerhart, James, \$554,061 from National Institute of Standards & Technology (U.S. Department of Commerce), for “North Carolina Manufacturing Extension Partnership.”
- Kelly, Robert, \$543,769 from US Dept. of Energy, for “Biohydrogenesis in the Thermotogales.”
- Lester, James, \$448,422 from National Science Foundation, for “HCC-Small: Modeling Student Affect in Game-Based Learning Environments.”
- Zikry, Mohammed, \$444,500 from Army Research Office, for “Micro structurally Engineered Armor System for Enhanced Survivability Through Optimum Energy and Momentum Dissipation.”
- Overton, Margery, \$421,745 from UNC –General Administration (US Department of Homeland Security).”
- Bourham, Mohamed, \$420,000 from Nuclear Regulatory Commission, for “Faculty Development Program in Nuclear Engineering at North Carolina State University.”
- Denton, Brian, \$400,000, from National Science Foundation, for “CAREER: Optimization of Screening and Treatment Delivery Systems for Chronic Diseases.”
- Jiang, Xuxian, \$400,000 from National Science Foundation, for “CT-ISG: Understanding Botnet C&C Communication Protocols”.
- Kleinstreuer, Clement, \$400,000 from National Science Foundation, for “Experimentally Validated Numerical Models of Nanomaterials.”
- Dayton, Paul, \$351,820 from National Institutes of Health, for “High-Sensitivity Molecular Imaging With Ultrasound.”
- Kelly, Robert, \$349,996 from Defense Threat Reduction Agency, for “Uranium Mobilization by Extremely Thermoacidophilic Archaea.”

- Dayton, Paul, \$324,469 from National Institutes of Health, for “Precision Engineering of Ultrasonically-targeted Drug Delivery Vehicles.”
- Ivy, Julie, \$301,539 from UNC-UNC Chapel Hill (Centers for Disease Control & Prevention), for “North Carolina Public Health Preparedness Systems Research Center, Engineering the North Carolina Health Alert Network.”
- Rozgonyi, George, \$300,000 from National Renewable Energy Lab, for “SiSoC Membership, Full Member.”
- Haugh, Jason, \$300,000 from National Science Foundation, for “Signaling Vector Analysis of Cell Migration.”
- Peters, Kara Jo, \$300,000 from National Science Foundation, for “Self-Healing Sandwich Composites.”
- De Los Reyes, Francis, \$299,995 from National Science Foundation, for “Identifying and Quantifying Functionally Active Denitrifying Microbial Populations in Complex Environments Using Catabolic Gene Expression Analysis.”
- Eun, Do, \$299,872 from National Science Foundation, for “NEDG: Efficient Design and Control of Heterogeneous Mobile Networks: Beyond Poisson Regime.”
- Eun, Do, \$270,000 from National Science Foundation, for “TF-SING: A Theoretical Foundation of Spatio-Temporal Mobility Modeling and Inducted Link-Level Dynamics.”
- Reeves, Douglas, \$268,510 from National Science Foundation, for “CT-ISG: The Origin of the Code: Automated Identification of Common Characteristics in Malware.”
- Doster, Joseph, \$255,468 from International Business Machines, for “Development of Parallel Numerical Algorithms Well Suited for the IBM 3090 with Vector Facilities Applicable to Computer Codes Used in Nuclear Engineering.”
- Henderson, Wesley, \$245,450 from Lawrence Berkley National Laboratory (US Dept. of Energy), for “Inexpensive, Nonfluorinated Anions for Lithium Salts and Ionic Liquids for Lithium Battery Electrolytes.”
- Maria, Jon-Paul, \$244,498 from National Science Foundation, for “CAREER: Structure Property Relationships in BiFeO₃: A Defect Chemistry Approach.”
- Doster, Joseph, \$241,357 from University of Tennessee (US Dept. O Energy), for “Applications of Sensitivity/Uncertainty Analysis to Optimum Instrumentation and Control of Next Generation Nuclear Power Systems.”
- Gamcsik, Michael, \$240,112 from National Institutes of Health, for “Noninvasive Monitoring Glutathione Metabolism in Tumors.”
- Wang, Wenye, \$230,342 from Defense Threat Reduction Agency, for “Robust Network Architecture Against Random Threats in WMD Environments: Theoretical Limits and Recovery Strategies.”
- Tuck, James, \$230,000 from National Science Foundation, for “CSR-PSCE, SM: Exploring Helper Computing Parallelism in Multicore Architectures.”

Golden LEAF Biomanufacturing Training and Education Center (BTEC)

A unique, cross-disciplinary instructional center, BTEC was founded to provide educational and training opportunities to develop skilled professionals for the biomanufacturing industry, thus contributing to the social and economic well being of the industry and the state. According to its vision statement, BTEC will be an international leader in education and training in biomanufacturing and bioprocessing, which involves cGMP production of high-value biomolecules using cell growth and expression, recovery, and purification processes. The BTEC facility and staff, and the industry-ready professionals it helps to educate and train, are to serve as catalysts in establishing, attracting, and

expanding biomanufacturing facilities in North Carolina. In addition, BTEC is to be an international center of excellence for the development of the next generation of cell protein and cell engineering techniques, bioreactors, downstream processes, and technologies for high throughput on-line analysis and optimization. To fulfill its mission and help realize this vision, BTEC leadership has identified seven strategic initiatives. Goals have been established for each initiative, and activities in support of these goals are ongoing. The seven strategic initiatives are

1. Educate NC State undergraduate and graduate students in various aspects of biomanufacturing, including cell growth and expression in bioreactors, recovery, purification, analysis and characterization.
2. Enhance the skills of biomanufacturing industry employees and professionals from other industries wishing to enter biomanufacturing.
3. Sponsor courses and events that will draw national and international subject matter experts to BTEC to educate external audiences nationally and internationally.
4. Maintain the BTEC facility as a state-of-the-art facility and increase capacity and functionality to draw additional students and development projects.
5. Collaborate with biotechnology, pharmaceutical and supply companies to develop new technologies.
6. Educate K-12 students and teachers, college freshmen and sophomores on career opportunities in biomanufacturing and the opportunities provided by BTEC.
7. Provide leadership to the biotechnology and biomanufacturing community to help support and grow the industry, to ensure that BTEC programs are on the leading edge of processing technology, and to maintain the support for BTEC from the state.

Since its inception, BTEC has focused primarily on the education of NC State undergraduate students, as well as potential post-baccalaureate students from industry. BTEC also houses students from industry who attend short courses provided by the North Carolina Community College System BioNetwork and its Validation Academy, which operates out of our facilities. BTEC sees various opportunities for enhancing its offerings via distance education, partnering with community colleges to provide their students hands-on experiences with large scale equipment, and offering a range of short courses to national and international students from other universities and industry. In addition, BTEC sees great potential in the use of its facilities to help large and small companies with process development projects that will help accelerate the commercialization of new technologies. The short courses and process development opportunities can also help provide resources to offset the state budget cuts experienced in FY08-09 and 09-10. Local industry, in the form of the Biomanufacturing Forum and NC BIO, are currently leading an effort to facilitate the identification of BTEC courses available to their membership. BTEC expects this effort will enhance industry participation in courses and increase BTEC's impact on economic development in North Carolina.

Engineering Extension

The Industrial Extension Service (IES) continued to provide excellent value to the state of North Carolina. Considering the total IES budget of \$13.1 million (approximately \$6.2 million in fee-for-service and \$6.9 million in appropriations and other sources) and the conservative estimate of nearly \$275M in economic impact—and understanding that economic impact is a lagging indicator of IES efforts—we can estimate that IES produced a return on investment of nearly 21:1.

IES is the North Carolina headquarters of the national Manufacturing Extension Partnership (MEP), an arrangement which began in March 1995 under a cooperative agreement between the U.S. Department of Commerce's National Institute of Standards and Technology (NIST) and IES. Sixteen regional IES offices provide nearly statewide coverage to business, industry, entrepreneurs, engineers, and local governments, with the goal of ensuring their continued viability in today's economy. As part of the national MEP program, NIST surveys IES clients several months after project completion to assess the economic impact in terms of increased sales, retained sales, cost savings, jobs retained, jobs created, and other results. In 2008, 174 companies responded to the NIST surveys and reported over \$274,000,000 in economic impact from IES activities: over \$139,000,000 in new and retained sales, over \$52,000,000 in reduced production or operation costs, and over \$83,000,000 of new investments in updated equipment and infrastructure. They also reported retaining or creating over 1,400 jobs as a result of IES assistance. IES continues working toward the ambitious goal of producing \$1B in economic impact for North Carolina from January 2006 through December 2010. As of the end of 2008, total dollars of impact recorded exceeded \$714M. The IES Marketing department manages the 1B4NC Award program, which recognizes companies with at least \$1 million in economic impact results, and presented 1B4NC awards to Atlantic Veneer in Beaufort; Cable Assembly, LLC, in Graham; Elastic Therapy, Inc., of Asheboro; KI in High Point; PCB Piezotronics, Inc., in Halifax; Precision Hydraulic Cylinders, Inc., of Beulaville; Tri-County Industries, Inc., of Washington; and Wavecom, Inc., in Research Triangle Park. In 2008-09, IES served a total of 884 companies, including 763 companies covered under the National Institute of Science and Technology's (NIST) Manufacturing Extension Partnership (MEP).

IES operates the NC State Technology Incubator, which provides office and laboratory space and access to university resources for start-up companies. Incubator clients include early- and late-stage start-up companies, three non-profit anchor tenants, and one entrepreneurial service provider. The incubator maintained occupancy between 96-100% in its 48 offices throughout the year, and its 10 wet lab spaces ranged from 80-100% occupied.

IES introduced the Lean Supply Chain product, and is developing four other lean manufacturing products: Lean Transformation, Lean Culture, Lean and Green, and Lean Product Development.

The Minerals Research Laboratory (MRL) continued work on the mine tailings project begun last year. Unfortunately, most of the MRL's research efforts are proprietary and cannot be published or discussed, and because the mineral industry has become highly competitive, clients will not release or provide data on economic impact generated by their interactions with the MRL.

As an IES vendor, the not-for-profit Polymers Center of Excellence (PCE) provided specialized extension services for the plastics industry. Revenues for this period totaled \$1,742,138, an 8% decrease from last year attributed to the deteriorating economy. According to 2008 NIST-MEP survey results, work accomplished by PCE had an economic impact of over \$76,000,000, with 100 jobs created or retained.

Another IES vendor, the Hosiery Technology Center (HTC) at Catawba Valley Community College was featured in an episode of the History Channel's *Modern Marvels* in July 2008 in recognition of its expertise in hosiery technology. During this reporting period, HTC responded to new lead exposure requirements in the Consumer Product Safety Improvement Act by testing children's clothing and determining that lead was not present in the fabrics in question. Their research resulted in January 2009 testimony before the Consumer Products Safety Commission in Washington, DC. Since then, the Center has consulted for many companies with a wide variety of products, but the most important result for North Carolina was the HTC testimony's impact on the 135,000+ textile jobs in the state. Before the testimony, many textile operations were considering closing under the threat of fines and testing costs.

Development and College Relations

During 2008-09, gifts and grant commitments from corporations, foundations, and individuals exceeded \$12 million. Gifts and pledges made directly to the NC State Engineering Foundation (NCSEF) totaled more than \$10 million. With 71% of our endowments "underwater," estimated lost spending for 2009-10 is about \$1.3 million, with \$524,000 being from scholarships and fellowships and about \$432,000 less in professorships than in 2008-09. A large portion of our time has been spent contacting donors to request supplements for the renewals for 2009-10. We have had a great response from our donors, and the majority of renewals for scholarships can be awarded. There will be limited funds for new awards and recruiting scholarships for 2009-10. The spending budget is less than 50% of the budget for 2008-09.

The Foundation Board of Directors and staff continue to focus on increasing alumni involvement and giving to benefit all areas of the College, as well as educating current students on the role of the Foundation and its philanthropic impact on their education. Private support enhances the College's ability to attract and retain the best faculty and students, develop new programs, enhance existing

initiatives, create and renovate facilities, upgrade equipment and licenses and more by providing a flexible revenue source above and beyond monies that are provided by the State of North Carolina.

Our annual fall Leadership Dinner, which honors Dean's Circle members had 117 people in attendance. Due to the current financial crisis, it was decided not to hold the annual endowment dinner.

The College Relations Committee of the NCSEF Board of Directors again hosted a series of recruiting events across the State. Meet the Dean events were held in Palm Beach, as well as local events at Progress Energy and SAS.

During the 2008-09 NCSEF had several staff changes. A new position was created for a Director of Development for Industrial and Systems Engineering, and Lori Richards joined us in this capacity. Lora Bremer joined us as the Director of Development for Civil, Construction, and Environmental Engineering. David Mainella, Associate Executive Director, left his position in April, and Martin Baucom assumed this position May 1. The position of Director of Corporate and Foundation Relations was abolished following Martin Baucom's move to the associate executive director position due to ongoing budgetary restrictions brought on by the current economic downturn.

Issues of Concern for the Future

NC State and the state of North Carolina can take pride in the outstanding accomplishments and excellent national and international reputation of its flagship College of Engineering. While the College made significant progress in many areas of engineering research and education prior to 2007, this progress had not kept pace with that of other colleges of engineering that were once comparable peers. With the support of our state legislature, our efforts since 2007 have focused on addressing critical faculty and capital infrastructure needs that move us in a direction to take our rightful place among the leading colleges of engineering in the world.

The operational support received in 2008-09 allowed the College to hire 14 faculty in interdisciplinary areas such as bioengineering and health systems, energy, and environmental systems. Investment in this area is an important step in increasing the number of research active faculty to a level more comparable with our peer colleges of engineering. Our ability to continue to recruit and retain outstanding faculty will be a major challenge as we move forward with the growth of our College. This challenge is made more difficult by the recent downturn in the economy and the resulting budget cuts realized in FY08-09 and planned for FY09-10.

Similarly, the capital infrastructure support provided since 2007 has facilitated the construction of Engineering Building III, scheduled to be completed in 2010. This is also a critical step in the College's move to Centennial Campus, its future growth, and the realization of its mission. While the current budget

situation has delayed support for the planning and design of EB IV and V and their eventual construction, funding for these buildings continues to be a high priority for the future of the College and the University.

We strongly believe that we have the potential to achieve our goal, but our success depends significantly on the continuation of the legislative support that has already played such a vital role in our improvement over the past several years. Our investments in 2007-08 resulted in a significant jump in our *US News* rankings from 34th to 30th; however, our peers have also increased investments in key areas. Illustrating this point is the fact that even though our overall ranking score increased in 2008-09 our position dropped to 31st, emphasizing the need to redouble our efforts at growing the faculty and investing in infrastructure. It is critical for the College to maintain the positive momentum that we have developed to improve our stature nationwide.

Of equal importance is the impact legislative support has in growing both the quality and quantity of engineering talent the College provides to the state and the economic impact of the many endeavors carried out by the College throughout the state. Many of these endeavors are a result of the federal and external support generated by these same faculty that we have hired and plan to hire through the legislative allocation. Our faculty have already focused on attracting federal stimulus funding and have successfully attracted important investments from the Department of Energy, the National Science Foundation and other federal agencies. These other sources of support are critical; however, they do not replace the necessary investments from the state.

With one of the largest enrollments in engineering in the country, we are a major producer of high quality engineering talent for our State and nation. This distinction helps North Carolina attract major companies and helps fuel the economy of our state. Our future ability to grow our enrollment and provide greater access to engineering education throughout the State depends on legislative support. Other concerns and challenges include increasing our research expenditures, increasing our endowment holdings for scholarships, fellowships and professorships, and expanding our distance education activities state, nation and worldwide.

Departmental Annual Reports

Below is a link to access annual reports from the academic departments and other units in the College of Engineering. <http://www.engr.ncsu.edu/news/about/AnnualRepts08-09.html>

Appendix A

College of Engineering Graduate Fellowships for 2008-09

Additional fellowships received this year were

- Alumni Association Graduate Fellowships
- Provost Fellowships
- Steve and Jane Warren–Wolfpack Club Graduate Fellowship
- NASA Harriet G. Jenkins Predoctoral Fellowship
- NCSU Minority Graduate Education supplemental grant
- Preparing the Professoriate award
- ACC Postgraduate Scholarship
- David and Lucille Packard Foundation Fellowships
- Randall L. and Susan P. Ward Graduate Fellowship
- Junius Mebane Andrews and Horace Porter Andrews Graduate Fellowship
- Collier Scholarship
- National Institutes of Health (NIH)/NC State Biotechnology Training Program Fellowship
- Emol A. Fails Graduate Fellowship, the National Physical Science Consortium (NPSC) Fellowship
- E.G. Moss Fellowship
- F.J. Hassler Fellowship
- Glaxo, Scholars for Tomorrow
- Board of Governor’s Fellowship
- Proctor and Gamble Graduate Fellowship
- NIA/NASA Graduate Fellowship
- National Defense Science and Engineering Graduate Fellowship
- Frank C. Ziglar Fellowship
- IBM Graduate Fellowship
- Department of Homeland Security Fellowship
- Transportation Founders Fund Scholarship Award
- National Water Research Institute Fellowship
- Sean McGrath Fellowship
- Ed Vick Fellowship
- Smallwood Fellowship
- NC Airport Association Bruce Matthews Aviation Fellowship
- Eisenhower Fellowship
- Southeastern Transportation Consortium
- Office of Naval Research (ONR) Historically Black Colleges and Universities (HBCU) Future Engineering Faculty Fellowship
- UNC Office of the President Genomics Fellowship
- Daniel P. Jenny Research Fellowship
- NC Space Grant Fellowships
- Kimley-Horn Fellowships The National Institute for Occupational Safety and Health (NIOSH) Fellowships
- Dr. Patrick Hill McDonald, Jr. and Dr. Clement Kleinstreuer Graduate Fellowship in Biofluid Mechanics

Appendix B

College of Engineering Awards and Honors for 2008-09

Department of Agricultural and Biological Engineering

William F. Hunt, 2008 American Society of Agricultural and Biological Engineers Young Extension Award

Dr. Gary Roberson, 2009 North American Colleges and Teachers of Agriculture Teaching Fellow Award

Department of Biomedical Engineering

David Lalush, Outstanding Teacher Award, NC State University

Peter Mente, Alumni Distinguished Undergraduate Professor Award, NC State University

Troy Nagle, Alexander Quarles Holladay Medal for Excellence, NC State University

Roger Narayan, 2008 Faculty Research Award, NC State Chapter of Sigma Xi

Roger Narayan, Structural Materials Division JOM Best Paper for 2009

Bruce J. Oberhardt, Fellow, American Institute for Medical and Biological Engineering (AIMBE)

Glenn Walker, Awarded Joint Department's First Wallace H. Coulter Foundation Award

Department of Chemical and Biomolecular Engineering

Lisa Bullard, 2008 NC State Faculty Adviser Award, NC State University

Lisa Bullard and Richard Felder, Joseph J. Martin Award, presented by the Chemical Engineering Division of ASEE annually for the best paper presented (and published in the proceedings) of the Annual Conference (2008).

Joseph DeSimone, 2008 Tar Heel of the Year, Raleigh *News & Observer*

Joseph DeSimone, Lemelson-MIT Prize for Invention and Innovation

Joseph DeSimone, "One Hundred Engineers of the Modern Era," American Institute of Chemical Engineers

Joseph DeSimone, 2009 Distinguished Graduate Alumni Achievement Award, Virginia Tech

Joseph DeSimone, 2009 Ulliot Lecturer sponsored by the Delaware and Philadelphia Sections of the ACS, University of Pennsylvania and the Chemical Heritage Foundation

Joseph DeSimone, 2009 M. Cruickshank Lecturer at the Gordon Research Conference on Polymers

Joseph DeSimone, 2009 Turner Alfrey Visiting Professor Lectures at Michigan Molecular Institute (MMI)

Joseph DeSimone, 2009 Chevron Phillip Lecture at Virginia Tech

Joseph DeSimone, 2008 Distinguished Lecture in Materials at Penn State University

Joseph DeSimone, 2008 Distinguished Lecturer in Frontiers of Cancer Nanotechnology at Emory University

Joseph DeSimone, 2008 Su Distinguished Lecture in Chemical Engineering, University of Rochester

Peter Fedkiw, Alumni Distinguished Graduate Professor, NC State University Graduate School

Richard Felder's book, *Elementary Principles of Chemical Processes*, "30 Authors and Their Groundbreaking Chemical Engineering Books," American Institute of Chemical Engineers

Richard Felder, Honorary Doctor of Science degree from the State University of New York, bestowed by Binghamton University

Jan Genzer, Visiting Professorship, University of Tokyo, Japan 2008

Jan Genzer, 10th Hála lecturer; Institute of Chemical Processes Fundamentals, Czech Republic 2009

Christine Grant, 2009 Chemical Council for Research Diversity Award

Keith Gubbins, Distinguished Visiting Fellow Award, Royal Academy of Engineering (RAE), London

Keith Gubbins, R.J. Reynolds Tobacco Company Award for Excellence in Teaching, Research and Extension

Keith Gubbins, "One Hundred Engineers of the Modern Era," American Institute of Chemical Engineers

Carol K. Hall, 2009 Kelly Lecturer, Purdue University

Carol K. Hall, 2009 Lacey Lecturer in Chemical Engineering, California Institute of Technology

Carol K. Hall, "One Hundred Engineers of the Modern Era," American Institute of Chemical Engineers

Sheila Hayes, 2009 Award for Excellence, College of Engineering

Saad Khan, Alumni Outstanding Research Award for 2007-2008

David Ollis, Honorary Doctorate, Technical University of Crete

Gregory Parsons, Outstanding Teacher Award, NC State University

Gregory Parsons, Alumni Outstanding Teacher Award for 2009, NC State University

Richard Spontak, editor-in-chief, *Open Colloid Science Journal*

Richard Spontak, Fellow, American Physical Society

Richard Spontak, 2008 Award for Excellence in Teaching from the University of North Carolina (UNC) Board of Governors

Richard Spontak, Outstanding Mid-Career Teaching Award, ASEE Southeast Section

Hubert Winston, 2009 Award for Excellence, College of Engineering

Department of Civil, Construction, and Environmental Engineering

Mort Barlaz, Distinguished Service Award, Association of Environmental Engineering & Scientific Profession

Joseph DeCarolis, U.S. EPA National Risk Management Research Laboratory team award for collaboration, 2008

Francis de los Reyes, Distinguished Alumnus Award, College of Engineering and Agro-Industrial Technology, University of the Philippines, 2008

Francis de los Reyes named Balik-Scientist by the Philippine Government, 2008

Joel Ducoste, selected to attend 2008 Japan-America Frontiers of Engineering Symposium, National Academy of Engineers (NAE)

Christopher Frey, appointed to the seven-member Clean Air Scientific Advisory Committee (CASAC) panel, U.S. Environmental Protection Agency

Christopher Frey, appointed to the National Research Council Committee on Tetrachloroethylene, National Research Council

Christopher Frey, NC Mobile CARE (clean air renewable energy) Individual Award

Abhinav Gupta, Visiting Faculty Fellowship from the U.S. Nuclear Regulatory Commission, 2008

Joesph Hummer, elected Fellow of the American Society of Civil Engineers (ASCE), 2008

David W. Johnston, Edward I Wiesiger Distinguished Professor in Construction Engineering

Roberto Nunez, Certification Award, American Concrete Institute (ACI)

Sami H. Rizkalla, 2008 Distinguished Educator Award, Precast/Prestressed Concrete Institute

Sami H. Rizkalla, Golden Mirko Ros Medal, Swiss Federal Laboratories for Materials Testing and Research (EMPA)

Sami H. Rizkalla, Joe W. Kelly Award, American Concrete Institute, 2008

Rudolf Seracino, Best Paper Award, 4th International Conference on FRP Composites in Civil Engineering, Zurich, 2008

John Stone. Honorary Professor, Universidad Catolica Andres Bello, Caracas, Venezuela, 2009

Department of Computer Science

NC State University, National Center of Excellence in Information Assurance Research, National Security Agency and U.S. Department of Homeland Security

Annie Antón, The IEEE Software's Most Cited Articles," Institute of Electrical and Electronics Engineers (IEEE)

Annie Antón, 2008 IBM Faculty Award, IBM

Kemafor Anyanwu, 2008 IBM Faculty Award, IBM

Vince Freeh, 2008 IBM Faculty Award, IBM

Helen Gu, 2008 IBM Faculty Award, IBM

Christopher Healey, 2008 IBM Faculty Award, IBM

Steffen Heber, 2008 IBM Faculty Award, IBM

Bobby Ray Johnson Jr. (alumnus), Distinguished Engineering Alumnus Award, College of Engineering

Peng Ning, 2009 IBM Open Collaborative Faculty Award

Robert Rodman, elected to American Academy of Forensic Sciences

George Rouskas, book published, "Internet Tiered Services: Theory, Economics, and Quality of Service."

Carla Savage, "12 Theorems by Women Mathematicians" calendar, theoremoftheday.org

Munindar P. Singh, Fellow, Institute of Electrical and Electronics Engineers

Laurie Williams, The IEEE Software's Most Cited Articles," Institute of Electrical and Electronics Engineers

Laurie Williams, "25th Anniversary Top Pick" for full-length peer-reviewed article, Institute of Electrical and Electronics Engineers (IEEE)

Laurie Williams, 2008 IBM Faculty Award, IBM

Tao Xie, 2008 IBM Faculty Award, IBM

Department of Electrical and Computer Engineering

Jay Baliga, July 2008 Tar Heel of the Week, Raleigh News & Observer

Brian Carty, 2009 Award for Excellence, College of Engineering

Ryan Going (student), Tar Heel of the Week, Raleigh *News & Observer*

Nino A. Masnari, Alexander Quarles Holladay Medal for Excellence, NC State University

Thomas K. Miller, Outstanding Leadership by an Individual in the field of Distance Learning, U.S. Distance Learning Association (USDLA)

Troy Nagle, Alexander Quarles Holladay Medal for Excellence, NC State University

Mehmet Ozturk, Fellow, IEEE

Wesley Snyder, Fellow, IEEE

Scot Wingo (alumnus), Distinguished Engineering Alumnus Award, College of Engineering

Edward P. Fitts Department of Industrial and Systems Engineering

Dick Bernhard IIE Fellow (June 2008)

Paul H. Cohen elected chair of IIE Council of Fellows (June 2008)

Brian Denton, Career Award, National Science Foundation (NSF)

Ola Harrysson, *Triangle Business Journal* 2009 Health Care Hero

Tim Glothlin, Board of Trustees senior vice president of technical networking, Institute of Industrial Engineers (IIE)

Russell King elected V.Chair of IIE Council (June 2008)

Gayle Lanier (alumna), Distinguished Engineering Alumnus Award, College of Engineering

Stephen D. Roberts, named A. Doug Allison Distinguished Professor in Industrial and Systems Engineering

Stephen D. Roberts named CA Anderson Outstanding Teacher in ISE (April 2009)

Stephen Roberts, Fellow, IIE (June 2008)

Department of Mechanical and Aerospace Engineering

Andre Mazzoleni – NCSU Outstanding Teacher Award

Steve Terry – North Carolina Leadership Award, North Carolina State Energy Office

Mohammed Zikry, 2008-09 Jefferson Science Fellow, U.S. Department of State

Department of Nuclear Engineering

Robin Gardner, 2009 Arthur Holly Compton Award, American Nuclear Society

Ayman Hawari, appointed Commissioner for Nuclear Reactors, Jordan Atomic Energy Commission (JAEC)

General Raymond T. Odierno (alumnus), U.S. Military Commander for Iraq

J. Phillip Sharpe (alumnus), 2008 Excellence in Fusion Engineering Award, Fusion Power Associates

Paul Turinsky, elected Chair of the National University Collaborators (NUC) in the Battelle Energy Alliance that manages the Idaho National Laboratory for the Department of Energy

C. Richard Vaughn (alumnus), Watauga Medal, NC State University

Department of Textile Engineering, Chemistry and Science

Journal of Polymer Science Part B: Polymer Physics Prize for 2009 awarded to S. Michielsen (With Hoon Joo Lee of TATM)

Gertrude M. Cox Award Winner: Dr. Jeff Joines (with Dr. Steve Roberts of ISE) Transformative Large-Scale Projects

M.A. Pasquinelli was selected as a Faculty Fellow for the Computing Across the Curriculum (CAC) NSF CPATH project during the Fall 2008 semester.

El-Shafei, A., Hauser, P., Helmy, H., "Durable Nanolayer Graft Polymerization of Textile Finishes Applied with High Density Atmospheric Pressure Plasma" Best Paper at 86th Textile Institute World Conference, Hong Kong

Alan Tonelli has received NTC Director's Award "For Excellence in demonstrating inter-university collaboration (NC-State--Georgia Tech.) within the NTC."

Board of Governors Award: Dr. Jeffrey Joines, nominee

Outstanding Teaching Award, College of Textiles: Dr. Keith Beck

Industrial Extension Service

IES extension specialists Wendy Laing and Rex Raiford received Outstanding Extension Service Awards.

IES computing support technician Joe Sutton received one of the Awards for Excellence on May 19.

At the national conference of the Manufacturing Extension Partnership in Orlando in May, IES web services manager KeAnne Hoeg was named one of the Unsung Heroes of the Year and IES extension specialist Rex Raiford was one of the Practitioners of the Year.

College of Engineering

First Year Engineering Program, Student Advocacy Award, NC State University

Engineering Online, named No. 1 Best Buy for online engineering graduate degrees, GetEducated.com

North Carolina Solar Center HealthyBuilt Homes program, Triangle Business Journal Green Award for Non-Profit Action Program of the Year

Laura Bottomley, Academy of Women, YWCA of the Greater Triangle

Linda Krute, 2009 Joseph M. Biedenbach Distinguished Service Award, Continuing Professional Development Division of the American Society for Engineering Education (ASEE)

Louis A. Martin-Vega, keynote speaker, Progress Energy Engineers' Day

Louis A. Martin-Vega, Outstanding Engineer in North Carolina for 2008, North Carolina Society of Engineers