The Department of Materials Science & Engineering had an outstanding 2006-2007 year. Three faculty joined the Department in August 2006. Jacob Jones was a highly sought-after young scientist out of Purdue with an expertise in electronic ceramics. Scott Perry is a world-recognized leader in nanotribology and joined us from a faculty position at the University of Houston. Marty Glicksman is a world-renown solidification expert from RPI. Both Perry and Glicksman were designated as 21st Century World Class Scholars — the only hires in Engineering with this designation. We also completed a faculty search this spring. We were very lucky to attract two young assistant professors — Shirley Meng from MIT and Michelle Manuel from Northwestern. Both of these women are outstanding scientists. Meng is an expert in the energy field of batteries, and Manuel is an expert in materials selection.

We successfully competed for two State of Florida Centers of Excellence. These were the only centers awarded to the University of Florida and the MSE Department led both of them. Each center was funded between $4 million and $5 million. The center on energy led by Eric Wachsman allows us to develop a prototype facility for fuel cells. The Department committed 3,000 square feet for the facility. We are very excited about this center and believe energy research will continue to grow as one of our core research missions. In addition, Brij Moudgil led a Center of Excellence proposal for nano-bio sensors.
We are excited about working with the National Institute for Nano-Engineering at Sandia. This is a major new national initiative to get students working on nanoengineering. This summer UF MSE launched the inaugural SUN (Students Understanding Nanotechnology) program. This program has enabled five freshmen interested in engineering to spend two weeks at Sandia attending lectures, touring facilities, shadowing scientists and going on field trips. We hope this can grow to between 100 and 200 UF students per year.

Congratulations to Elliot Douglas, Simon Phillpot and Eric Wachsman for winning our faculty excellence awards, and to Gerhard Fuchs for winning the MSE Triple Point Award.

The Department is doing well. Our undergraduate enrollment has increased to 160, and we have more than 30 National Merit Finalists. More than 65 percent of our undergraduates go to graduate school. Our graduate enrollment is at an all-time high this fall with 285 students and with about 200 Ph.D. students. Our research expenditures for last year were $10 million and this will increase significantly with the new centers. We lead the UF College of Engineering in sponsored research dollars per faculty, Ph.D.s per faculty, and are publishing at a rate of more than eight journal publications per faculty member per year.

This is the second year of our Research Experience in Materials Program. This program costs only $3,000 per student but enables freshmen and sophomores to work in a lab and get paid for learning how research is done. The students say they love the program, and last year more than 60 students applied. However we only had funding for 12 students. This year, thanks to a generous donation from Wally Rhines, we will be able to support an additional five students. We are very excited to get students into the lab early and allow them opportunity to experience the fun that is Materials Science and Engineering.

GO GATORS!
The 21st Century World Class Scholars Program was established in 2006 by the Florida Legislature to propel the state’s reputation as an academic, research and technological powerhouse. The legislature provides matching funds to state universities to retain and recruit leaders in science, engineering, technology and mathematics.

Of the 24 candidates submitted for this award, two were from the Department of Materials Science & Engineering. Martin Glicksman and Scott Perry were distinguished as 21st Century World Class Scholars.

Glicksman came to the College in 2006. He is a well-known researcher and member of the National Academy of Engineering from Rensselaer Polytechnic Institute. He brings a wealth of knowledge including expertise on the kinetics of solidification.

Perry is a recognized leader in nanotribiology. His work focuses on applying various scanning probe techniques to understand wear at the atomic level, including understanding how water functions as a lubricant in human joints.
IN 2006, THE DEPARTMENT HIRED JACOB JONES as a tenure-track assistant professor specializing in ceramics.

Jones earned his Ph.D. at Purdue in 2004 and spent two years in Australia working on a postdoctoral experience through the NSF International Research Fellowship Program.

Jones’ interests have both breadth and depth. His background and specialization in electromechanical behavior bridges the fields of electroceramics, mechanical behavior and advanced structural characterization — enabling him to collaborate extensively with a variety of faculty.

In support of Jones’ research plans, the university has provided more than $550,000 in startup funds and two dedicated laboratory spaces in Rhines Hall and the Major Analytical Instrumentation Center. The Department is also committing to $40,000 for the next five years for student travel.

In his first year, Jones demonstrated great promise. He achieved 4.5 out of a possible 5.0 rating on his student evaluations for overall teaching. The Department has a tradition — dating back 40 years — of reserving required undergraduate courses for only the best instructors. Jones has demonstrated that ability, and he will be teaching a required course in the undergraduate curriculum starting next semester, Materials Stability. He brings a background of ceramics that’s long overdue in a course which has traditionally been focused on metallic corrosion. His enthusiasm toward teaching students and his ability to reach out to a diverse group of students is apparent in his teaching evaluations, which are outstanding and frequently note how “very enthusiastic” he is in the classroom.
The NSF CAREER Award Henry Hess received in 2007 supports a research program in the utilization of molecular motors in the self-assembly processes. Molecular motors are nanoscale machines which convert chemical energy directly into mechanical work. In biological systems, specialized molecular motors called motor proteins contract muscles and deliver molecular cargo within cells. Hess’ research is focused on the engineering applications of such biomolecular motors, particularly in nanotechnology. Self-assembly processes are critical for nanotechnology and biology, but engineers do not yet master self-assembly to the degree displayed by nature. One reason why nature produces more complex structures is it actively moves building blocks into the desired configuration rather than relying on random thermal movement.

The goal of the CAREER Award project is to utilize biomolecular motors in an engineered environment to influence self-assembly processes. Imagine a barge available to assemble logs floating in a river into rafts. The push provided by the barge can accelerate the process, resolve tangles, and even force logs on top of each other. Similarly, biomolecular motors can help create non-equilibrium nanostructures from more building blocks and with fewer defects.
Two materials science graduate students, Isaac Luria and Jasmine Davenport, will tackle the experimental and simulation aspects of the project. Simon Phillpot is advising in the development of a dedicated computer-simulation environment.

An important aspect of the program is the integration of undergraduate students into the research process and their exposure to the international community of researchers. Matthew Downs, a materials major and undergraduate researcher in the Hess group, will conduct related research during the summer with Takahiro Nitta at Gifu University in Japan. Downs is supported by the CAREER Award, the Research Experience in Materials program and the HHMI “Science for Life” program. Successful competition for this award would not have been possible without the extensive support and mentoring from the department chair, faculty and staff.

Jiangeng Xue received an NSF CAREER Award in 2007 to develop high efficiency organic-based solar cells for low-cost solar-energy conversion.

Finding sufficient supplies of clean energy to replace the depleting and polluting fossil fuels will be one of society’s foremost challenges for the next half-century. Solar energy is clean, abundant and renewable. Yet it is vastly underutilized in the world due to high costs associated with its capture and conversion. Organic electronic materials — or organic semiconductors — have several technological advantages over their inorganic counterparts (e.g. silicon), such as low material costs, ease of processing, compatibility with flexible substrates and roll-to-roll processing, and tunability of material properties via chemical structure modification. Therefore, solar cells based on organic semiconductors have great potential to significantly reduce the cost of direct conversion of sunlight to electricity. During his Ph.D. study at Princeton University, Xue was involved in developing organic solar cells and demonstrated devices with record efficiencies, for which he won a Solar Energy Innovation Award at Princeton.

At the University of Florida, Xue strives to gain a more profound understanding of the fundamental physical properties and processing of organic semiconductors. He also hopes to develop novel electronic and optoelectronic devices with interesting performance characteristics or with performance suitable for practical use. With this NSF CAREER Award, Xue and his students will address several fundamental materials and device issues in organic solar cells by employing novel nanostructures and approaches to manage the photons, excitons and electrons. The goal is to significantly increase the power-conversion efficiency of these devices from the current 5 percent to 15 percent to 20 percent in five years.
College of Engineering
Undergraduate Scholarships
Fall 2007 – Spring 2008

Anesia Burns, Paslay Scholarship
Yuchen Huo, Snelling Scholarship
Martin McBriarty, Snelling Scholarship
Heather Meredith, General Engineering Scholarship
Margo Monroe, Goodrum Scholarship
Suzana Vallejo-Heligon, Dean’s Scholarship
Corey Wilson, Bauch Scholarship

REMP Participants Fall 2006
Shaun Ajinkya; Gower
Kyle Allen; Nino
Richard Barrett; Gower
Sarah Bobek; Beatty
Zachary Bryan; Kevin Jones
Anesia Burns; Phillpot
Kathleen Crawford; Beatty
Jaime Elkind; Fuchs
Yuchen Huo; Kevin Jones
Andrew LoPiccolo; Beatty
Heather Meredith; Batch
Elizabeth Mobley; Hess
P. Cory Myers; Jacob Jones
Jacob Papp; Ebrahimi
Jacob Piper; Phillpot
Kevin Tierney; Nino
Jeremy Young; Beatty
Jack Zhang; Kevin Jones

Summer Internships 2007
Brian Babcox, Edak, Melbourne, Florida
Cosima Boswell, Max-Planck-Institut fuer Plasmaphysik, Garching, Germany
Andrew Claus, Air Products and Chemicals, Inc., Allentown, Pennsylvania
Matthew Downs, Predicting Molecular Shuttle Movement, Gifu University, Gifu, Japan
Maribel Ibanez, Regeneration Technologies, Gainesville, Florida
Heather Meredith, Convergent Engineering, Gainesville, Florida
Clay Pearson, NASA, Kennedy Space Center

Rob Pedicone, Saint-Gobain High Performance Materials, Northboro, MA
Crystal Rocher, Environmental Consulting and Technology, Orlando, Florida
D. Caroline Wise, Prosthetic & Orthotic Associates, Orlando, Florida

Summer Internships 2006 – 2007

Anesia Burns, REU, University of Massachusetts, Amherst
Chamoria Clark, Research w/ Ebrahimi, University of Florida
Kathleen Crawford, REU, University of Minnesota
Matthew Downs, NASA Robotics Academy Internship, Goddard Space Flight Center, Maryland
Yuchen “Sherry” Huo, REU, Georgia Institute of Technology
Jonah Klemm-Toole, Research w/ Hans Seifert, The Technical University of Freiberg
Daniel Larsen, Research w/ Nino, University of Florida
Ryan Mills, MSE, UF w/ Nino, Howard Hughes Medical Institute Scholarship
Martin McBriarty, Materials Processing Center, Massachusetts Institute of Technology
Margo Monroe, Research w/ Douglas, University of Florida
David Moore, Research w/ Ben Dunn, University of Florida
Joelle Payne, Research w/ Justin Sanchez, University of Florida
Jacob Piper, Research w/ Phillpot, University of Florida

University Scholars Program 2007
Matthew Downs
Alan Kim
Margo Monroe
Alex Theodore

Dean’s List Spring 2007
Shaun Ajinkya
Brian Babcox
Stephen Batog
Kyle Bernet
Jon Besser
Ryan Boggs
Cosima Boswell
Kara Brogan
Zachary Bryan
Riley Butler
Matt Carstens
Chelsea Catania
Christina Chang
Yen-Hao Chen
Andrwe Claus
Tylor Cordell
Ryan Courtney
Kathleen Crawford
Lisa Daniels
Leonardo Del Valle
Caitlin Dennis
Christopher Dosch
Matthew Downs
James Farrell
David Harris
Joshua Harris
Timothy Henry
Marta Giachino
Kevin Gilley
Michael Haddad
Daniel Hall
Yuchen Huo
Maribel Ibanez
Christopher Keane
Cynthia Klein
Jonah Klemm-Toole
David Kolesky
Daniel Larsen
Steven Lee
Spring 2007
(89 percent cum laude or above)

Riley Butler, cum laude
Ruby Chen, cum laude
Lauren Culver, summa cum laude

Ellina Gendlinia, summa cum laude
Julian Guzman, summa cum laude
Ira Harkness, cum laude
David Harris, cum laude
M. Ray Holzworth, magna cum laude
Carlos Inguanzo
Karly Jacobsen, cum laude
Cynthia Klein, summa cum laude
Alvaro Mendoza, cum laude
Jason Myers, summa cum laude
Eric Nestler, cum laude
Paul Robinson, cum laude
Philip Rolando, cum laude
Jeffrey Schroeder, summa cum laude
Matthew Soicher, cum laude
Jay Vincelli

DEGREE SIDE NOTE: 82 percent of the past year’s graduates graduated cum laude (3.3 upper division GPA) or above

Teach Summer Program 2007

Michael Addison, Andrew Jackson High School, Jacksonville, Florida
William Arnold, Englewood High School, Jacksonville, Florida
Iris Bailey, Buchholz High School, Gainesville, Florida
Marcia Parker, Crescent City Junior/Senior High School, Crescent City, Florida
Amy Guidry, Carencro High School, Lafayette, Louisiana
Allan Hisey, Forest High Engineering Academy, Ocala, Florida
Joyce Hoffeditz, Wright City High School, St. Charles, Missouri
Larry Hoffeditz, Wright City High School, St. Charles, Missouri

Fall 2006 – Summer 2007 Employment/Graduate School Commitments for Graduates — Where Are The 2006 – 2007 B.S. Graduates Now?

Graduate School, Berkeley
Graduate School, Biomedical Engineering, Northwestern
Graduate School, Biomedical Engineering, UC-Davis
Graduate School, MSE, MIT
Graduate School, MSE, UCF
Graduate School, MSE, UF
Graduate School, University of Massachusetts, Amherst
Law School, UF
Nuclear Operations Program, KAPL
RF Components Engineer I, Raytheon, Andover, MA
Seimens Power Generation
Worship Leader, Cypress Lake United Methodist Church, Ft. Myers, Florida

Denyse Hunt, Treasure Coast High School, Jensen Beach, Florida
Loretta LaMore, Dixie Hollins High School, Pinellas Park, Florida
Hayley LeJeune, Carencro High School, Lafayette, Louisiana
Kent Martin, Kentucky Country Day School, Louisville, Kentucky
Carmen Morales, Englewood High School, Jacksonville, Florida
Vaughn Morrill III, Eskridge High School, Olivette, Missouri
Michael Murray, Forest High Engineering Academy, Ocala, Florida
Jan Robbins, Crescent City Junior/Senior High School, Crescent City, Florida
Victoria Wisnoski, Crescent City Junior/Senior High School, Crescent City, Florida

MATERIALS WORLD science & engineering
The Department produces major industry players like the global president of HOYA Medical, the director and vice president of JEOL USA Inc., and the president and CEO of Key Medical Technologies Inc. The Department consistently ranks in the Top-10 of similarly ranked programs according to U.S. News & World Report. It is the highest-ranked department in the College, making itself a candy store for industry recruiters.

But Department Chair Kevin Jones is ready for more. He is ready for the Department to put its stamp on the world of academia, so he instituted the faculty development program to evoke interest in the academic arena from students. Faculty members were invited to identify students in their research groups with an interest in academia or who they felt had the skills to lead a successful academic career. The program kicked off with 15 students, their advisers and other key faculty as an open forum discussion. Jones himself was starting to better understand some of the obstacles students face in pursuing academia.

"The MSE department has a number of graduate students in our program who would make outstanding faculty members at other universities," Jones said. "However, because they do not understand what the job entails, they often are intimidated about a career as a faculty member. The faculty development program is a unique program that allows the faculty to share their experiences about preparing for an academic career."

REM is a great way to get involved with research and learn more about the diverse field of materials engineering. There is so much to learn, and it is cool when you get to see the things you learn in class come to life in the research.

"As a first-year undergraduate student, I feel that participating in the Research Experience in Materials co-op was beneficial in quickly adjusting me into the college experience. The REM program has taught me how to function effectively with a team of engineers and how to apply and integrate basic principles of math, chemistry and engineering. I now have the ability and confidence to design and conduct experiments and to analyze and interpret the data from these experiments. Due to the REM, I was able to obtain a highly favorable job at a local biomedical engineering company, where I am participating in the Research Experiences for Undergraduates."

Heather Meredith

"Being a part of the REM program has been an amazing experience. It has allowed me to explore my interest in biomaterials research under the constant guidance of my mentors, Dr. Laurie Gower and Sara Jensen. The combination of experience, dedication and knowledge has given me the chance to grow as a researcher and as a student."

Richard Barrett

"I really enjoyed working as an REM student. It’s a great way for undergrads to get an idea of what kind of research is going on out there in his/her field."

Jack Zhang

The REM program helped me to get a feel for hands-on lab work. You are using your own procedures to get results that you interpret and analyze.

Jake Papp

The Research Experience in Materials Program is for freshmen and sophomore students. The program allows students interested in research to work in a graduate laboratory. The undergraduates get hands-on experience in an atmosphere of collaboration with their senior peers. The students are also paid $10 an hour to work in the labs.
Centers of Excellence

In order for Florida to rise and stay as a technologically advanced state, it has established the Technology Development Fund. This enables the state to allocate research money for Centers of Excellence. The centers are meant to bridge the gap between academia and business to give university research a head start toward commercialization.

This past year the state awarded seven centers to universities across the state. UF — specifically the College of Engineering Department of Materials Science & Engineering — was selected to receive $8.5 million to fund two centers. One center is the $4.5 million Energy Technology Incubator housed within the Florida Institute for Sustainable Energy led by Eric Wachsman. The technology development fund also awarded $4 million for the Center for Nano-Bio Sensors led by Brij Moudgil.

The FISE Energy Technology Incubator’s main goal is to accelerate commercialization of energy technologies being worked on at the Florida Institute for Sustainable Energy. The Institute brings together the broad research capabilities of UF to address societal needs for a sustainable energy future. The Institute’s structure covers numerous units within the colleges of Engineering, Business, Law, Building Construction, and Liberal Arts and Sciences, and SNRE, IFAS and the UF Office of Sustainability — while providing the necessary umbrella to promote interdisciplinary research and education.

The Center for Nano-Bio Sensors at the University of Florida will harness select world-class resources in nano-bio technology to produce tools and methodologies for early diagnosis of diseases and timely detection and intervention for chemical and bioterrorism threats, leading to high-value health care and homeland security deliverables.
My employer has a matching gift program. I will arrange for a matching gift.

I am interested in information on making a large gift ($5,000 or more).

I am interested in information on establishing an estate gift.

$________ for Department teaching programs.
$________ for the Department scholarship fund.
$________ for Department research programs.
$________ for the Robert DeHoff Endowed Professorship.
$________ for ____________________________.

Your private contributions are welcome so that we may continue to excel in our undergraduate and graduate academic programs. All contributions are tax deductible. Online giving is also available at www.mse.ufl.edu.

Yes, I would like to help support the Department of Materials Science & Engineering. My donation is:

Please specify that your contribution is for the Department of Materials Science & Engineering, and make your check payable to the University of Florida Foundation.

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