The economic landscape of South Carolina has changed over the past 20 years. We are now home to several multinational companies, and even our local ones have extensive international footprints. The Upstate alone has more than 250 international firms and has the highest level of foreign capital investment per capita in the nation. South Carolina ranks second in the nation in terms of the percentage of its private workforce employed by foreign investment. In this global environment, higher education institutions play a role in innovation, research, education and economic development. Clemson University has become a leader through its international research and collaboration, and the Industrial Engineering Department has created a dynamic environment in its classrooms and laboratories, one that has brought the world’s talent to our doorstep, providing our students with experiences that enrich them in the classroom and beyond. Examples of these efforts can be seen in the review of their research below.

Some of the most important research in the Department focuses on issues in healthcare and healthcare delivery systems. For example, PhD student Odette Reifsnider from the United States and her advisor Dr. Maria Mayorga are collaborating with researchers at the Medical University of South Carolina in analyzing clinical processes to predict the long-term consequences of diseases. Specifically, they are developing two simulation models, one exploring the cost-effectiveness of various smoking cessation treatments and the second predicting the effects of intrauterine exposure to maternal obesity and diabetes on the prevalence of diabetes in subsequent generations. While the estimates resulting from these two models are specific to these two health concerns, many of the techniques developed from this collaboration are generic and can easily be applied across diseases.

Research currently being conducted by Dr. Rae Cho and his PhD student Melissa Zelaya from Honduras focuses on the development of new drug formulation systems to maximize bioavailability and improve manufacturability as part of a preclinical R&D effort. They are also developing a stepwise scale-up design system which will upgrade a small-scale laboratory-based drug formulation system into a good manufacturing practice (cGMP) large-scale environment.

PhD student Yuan-Han Huang from Taiwan is working with his advisor Dr. Sandra Garrett on the quality of communication in long-term healthcare facilities. Using five dimensions of communication quality, Huang’s work demonstrates how the characteristics
Appointments

Dr. Scott J. Mason, Fluor Endowed Chair in Supply Chain Optimization and Logistics

Dr. Scott J. Mason is the inaugural Fluor Endowed Chair in Supply Chain Optimization and Logistics and a Professor in the Department of Industrial Engineering. Prior to joining Clemson, Dr. Mason spent 10 years in the Department of Industrial Engineering at the University of Arkansas. He received his PhD in Industrial Engineering from Arizona State University after earning Bachelor’s and Master’s degrees from The University of Texas at Austin. Dr. Mason’s areas of focus include optimization, algorithms, and operations planning, scheduling, and control of capital project supply chains and large-scale systems modeling, with domain expertise in semiconductor manufacturing. He is an Associate Editor for IEEE Transactions on Electronics Packaging Manufacturing, a senior member of the Institute for Industrial Engineers and a member of INFORMS. He can be reached at mason@clemson.edu.

Dr. Ashley Kay Childers has joined the IE Department as a Research Assistant Professor. Her current focus is on healthcare, specifically identifying re-engineering solutions to the traditional systems of care delivery. She can be reached at childers@clemson.edu.

Promotions and Tenure

Dr. Kevin M. Taaffe has been promoted to Associate Professor with tenure.

2010 Department Awards

Professor of the Year
Dr. Joel Greenstein

Senior Academic Achievement
Whitney Rae Derby
Mary Beth McLeod
Joshua Stephen VonFange

Outstanding Senior
Nathaniel Adam Cund
Jim Chishman Outstanding Senior
Jennifer Marie Tate

Junior Academic Achievement
Brian Edward Jones

Six Sigma TRAINING

• Green Belt Certification
• Black Belt Certification
• Custom Training

On Demand and Online Training at Clemson University
Contact B. Robinson for more information brobin4@clemson.edu

2010 Professor of the Year Dr. Joel Greenstein working on an affinity chart

Faculty Awards

Dr. Scott Shappell has been awarded the 2010 Henry L. Taylor's Founders Award for Outstanding Contributions in the field of Aerospace Human Factors. The winner of this award must demonstrate contributions to the field of aerospace human factors through research and publications, original contributions and general leadership.

Dr. Maria Mayorga won the CoES Faculty Collaboration Award in May 2010. This award recognizes notable interdisciplinary contribution to the College of Engineering and Science. These collaborative efforts align with two of Clemson’s emphasis areas: Automotive and Transportation Technology and General Education.

Department Highlights

Dr. Scott J. Mason, Fluor Endowed Chair in Supply Chain Optimization and Logistics

Dr. Joel Greenstein has been awarded the 2010 Henry L. Taylor’s Founders Award for Outstanding Contributions in the field of Aerospace Human Factors. The winner of this award must demonstrate contributions to the field of aerospace human factors through research and publications, original contributions and general leadership.

Dr. Maria Mayorga has developed a simulator to provide an alternative to the traditional training, her results indicating its potential as a viable approach. (Continued on Page 4)

Sophomores entering IE get hands-on experience in design through the Department’s Creative Inquiry Program led by an award-winning instructor, Dr. Joel Greenstein. Recipient of the Best Teacher of the Year Award five times in this decade, he challenges his students to find solutions to real-world problems using the design principles learned in class. Under the guidance of this master teacher, these students gain a solid foundation in IE, one that they will carry forward to apply to their capstone design project in their senior year when they work with industry clients. Thanks to Dr. Greenstein’s creativity and his ability to connect with his students both in and out of the classroom, our students leave Clemson prepared for the 21st Century.
Similarly, Andreas Boeker, a Master’s student from Germany and his advisor, Dr. Maria Mayorga, are using discrete event simulation software to create a virtual representation of a sub-assembly line at the BMW manufacturing plant in Greer. This model has been used to analyze the effects of various variables on the line’s productivity. According to Andreas, “the recommendations given to BMW have already increased the throughput and decreased the downtime of the equipment of the line.”

PhD students Paul Goethals from the U.S. and Lucy Aragon from Peru, both advised by Dr. Rae Cho, work in the area of developing new conceptual and mathematical tools for quality improvement and process optimization. Their recent collaboration on developing optimal decision criteria for estimators was published in a top-tier journal.

This mix of international students provides a fertile ground for exposing our students to a variety of cultures, developing in them an awareness of global issues. This diversity enriches the learning experience, creating engineers who can not only address the complex technical challenges facing us but who are also more sensitive and educated global citizens, a clear need for the Engineer of 2020.