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I am pleased to share with you the major scholarly activities of our faculty members and students during the 2013 – 2014 calendar years. Also included are the 2011 – 2012 achievements of our new faculty colleagues, Professors Huazhen Fang, Xiaoglin Li, Lin Liu, and Candan Tamerler.

The generation and dissemination of knowledge that is of lasting value is the primary function of any university. The process of discovery prepares students for lifelong learning. Sharing discoveries through publication and professional service both enables its usage and earns the admiration of our professional colleagues.

Our department's Biennial Report series, initiated in 2013, documents the contributions of our faculty members and the students they mentor. During the 2013 and 2014 calendar years, our faculty members authored or co-authored 79 refereed journal articles, 5 book chapters, 4 books and one patent. During the biennium our scholarly work was cited over 8700 times (source: Google Scholar) by colleagues worldwide. This productivity is testament to the dedication of our faculty in advancing engineering and scientific knowledge.


Sincerely,

Theodore L. Bergman
Charles E. & Mary Jane Spahr Professor
Chairman, Department of Mechanical Engineering
The University of Kansas

The University of Kansas
Department of Mechanical Engineering
1530 West 15th Street, Learned 3144B
Lawrence, KS 66045
Faculty Profiles

Theodore L. Bergman
Charles E. & Mary Jane Spahr Professor
Chair, Department of Mechanical Engineering
Ph.D. Purdue University, 1985

Dr. Bergman joined the Department of Mechanical Engineering in 2012. He was previously a faculty member at the University of Connecticut (1996 – 2012) and The University of Texas at Austin (1985 –1996). From 1998 to 2004 he was Head of the Mechanical Engineering Department at UConn and served as Associate Dean of Engineering for Research and Outreach in 2004 and 2005, also at the University of Connecticut. He directed the Thermal Transport Processes Program at the National Science Foundation from 2008 to 2010. Early in his career, Dr. Bergman worked at Black & Veatch as a design engineer.

Dr. Bergman conducts research in the thermal sciences as applied to advanced manufacturing and alternative energy systems. He is a co-author of several heat transfer texts, has served as an Associate Editor for the ASME Journal of Heat Transfer as well as Frontiers in Heat Transfer, and has received a number of awards including the NSF Presidential Young Investigator Award, the ASME Heat Transfer Division Best Paper Award, and the ASME Melville Medal. Dr. Bergman is a Fellow of the American Society of Mechanical Engineers.

Christopher Depcik
Docking Faculty Scholar, Associate Professor
Ph.D. University of Michigan, 2003

Dr. Depcik joined the Department of Mechanical Engineering in 2008. He previously worked at the University of Michigan as a post-doctoral research fellow. Dr. Depcik conducts research pertaining to sustainable energy usage and the transportation infrastructure including Feedstock-to-Tailpipe analyses of fuel production and its subsequent combustion including the influence of the feedstock and fuel on exhaust emissions. Also of interest is energy recovery utilizing multiple feedstocks and different fuels. A major effort is the development of predictive models for catalytic exhaust aftertreatment devices.

Dr. Depcik's EcoHawks students design and research electrified vehicles and renewable energy sources, including the interconnection of the vehicles and energy sources with the electrical grid. He is a member of both the American Society of Mechanical Engineers and the Society of Automotive Engineers (SAE). In 2012 he received the SAE Ralph R. Teetor Educational Award in recognition of his transportation-related research and educational activities.
Faculty Profiles

Ronald L. Dougherty
Professor
Executive Associate Chair
Ph.D. University of Missouri – Rolla (now Missouri S&T), 1978

Dr. Dougherty joined the Mechanical Engineering Department at KU in 1999. He was previously at Oklahoma State (1985 – 1999), and worked in industry at Pratt & Whitney (1978 – 1982) and Terra Tek (1982 – 1985). He served as Chair of the Mechanical Engineering Department for 13 years, from 1999 to 2012. His areas of research include laser diagnostics, particulate characterization, two-phase fluid flow and heat transfer, power plant thermal modeling, pumping systems, boiling, and forensic blood spatter.

Dr. Dougherty is a Fellow of the American Society of Mechanical Engineers, and is a member of the American Institute of Aeronautics and Astronautics (Associate Fellow), the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, the American Society for Engineering Education, and Sigma Xi. He served for over a decade as an Associate Editor for the AIAA Journal of Thermophysics and Heat Transfer, and he is a Registered Professional Engineer in Oklahoma.

Huazhen Fang
Assistant Professor
Ph.D. University of California, San Diego, 2014

Dr. Fang joined the University of Kansas Mechanical Engineering Department in the Fall of 2014 as an Assistant Professor. He received his Ph.D. in Mechanical Engineering from the University of California, San Diego in 2014, where he developed advanced control systems and algorithms for energy management and environmental monitoring applications. He has industrial experience at NEC Laboratories America and Mitsubishi Electric Research Laboratories.

Kenneth J. Fischer
Professor
Ph.D. Stanford University, 1995

Dr. Fischer joined the Department of Mechanical Engineering in 2000. He holds secondary faculty appointments in the Departments of Orthopedic Surgery as well as in Physical Therapy and Rehabilitation Sciences at the University of Kansas Medical Center. He was previously a faculty member at the University of Pittsburgh (1995 – 2000). Early in his career, Dr. Fischer worked at Boeing as a systems engineer and in manufacturing research and development.

Dr. Fischer conducts research in musculoskeletal biomechanics. He has served as an Associate Editor for the ASME Journal of Biomechanical Engineering and is a member of the American Society of Mechanical Engineers, the American Society of Biomechanics, the Orthopaedic Research Society, and the American Society for Engineering Education.
Elizabeth A. Friis  
Associate Professor  
Ph.D. Wichita State University, 1994

Dr. Friis joined the Department in 2001. Before KU, she was a Research Scientist at the Orthopaedic Research Institute from 1987 to 2001. Dr. Friis’ main research interests are in biomaterials and biomechanics, with emphasis in spine biomechanics and mechanical testing and design of implants. Dr. Friis has led several efforts at KU to incorporate technology entrepreneurship education into the engineering curriculum.

Dr. Friis has served on the Editorial Board of The Journal of Biomedical Materials Research – Part A since 2007. In 2004, Dr. Friis was a Kauffman Entrepreneurial Faculty Scholar and was in the charter class of an entrepreneurial development program (PIPELINE) in 2007. She served as the Director of the Graduate Fellowship Program for the Institute for Advancing Medical Innovation from 2009 to 2011. Dr. Friis has received several National Science Foundation and National Institutes of Health Small Business Innovation Research awards, and has licensed technologies that are currently commercialized.

Sarah L. Kieweg  
Associate Professor  
Ph.D. Duke University, 2005

Dr. Kieweg joined the Department in 2006. She has held a courtesy position in Obstetrics & Gynecology at the KU School of Medicine since 2007. Dr. Kieweg conducts research in non-Newtonian fluid mechanics with applications in biomechanics, primarily to improve the drug delivery of anti-HIV microbicides. Her research also has applications in women's health including instrument design, soft tissue mechanics of the female pelvic floor, and the biomechanics of delivery.

Dr. Kieweg was a National Institutes of Health (NIH) K12 Building Interdisciplinary Research Careers in Women's Health (BIRCWH) Scholar (2007 – 2011). She is conducting high performance computational simulations of thin film flow of non-Newtonian fluids to enable the rational design of microbicide delivery vehicles. Other projects include the development of mathematical models of relevant transport phenomena to design nanomedicines for microbicide drug delivery.

Xianglin Li  
Assistant Professor  
Ph.D. University of Connecticut, 2012

Dr. Li joined the Mechanical Engineering Department in the Fall of 2014 as an Assistant Professor. He received his Ph.D. in Mechanical Engineering from the University of Connecticut in 2012, where he investigated the electrochemical, as well as heat and mass transfer aspects of advanced fuel cell and battery concepts. Most recently, Dr. Li served as a Senior Scientific Engineering Associate at the Lawrence Berkeley National Laboratory, where he was involved with full fuel cycle analysis of non-conventional natural gas production and usage, as well as appliance efficiency standards in residential, commercial, and industrial applications.
Faculty Profiles

Lin Liu
Assistant Professor
Ph.D. Iowa State University, 2011

Dr. Liu joined the Mechanical Engineering Department in the Fall of 2013 as an Assistant Professor. Dr. Liu received his Ph.D. in Mechanical Engineering from Iowa State, where he developed models to predict both the electrochemical performance and the structural reliability of solid oxide fuel cells. Dr. Liu most recently was a post-doctoral fellow at the University of Michigan, Ann Arbor where he investigated the degradation mechanisms leading to the failure of lithium-ion batteries. He has industrial experience at General Motors and The Stanley Works.

Carl W. Luchies
Associate Professor
Ph.D. University of Michigan, 1991

Dr. Luchies joined the Department of Mechanical Engineering in 1996. He was previously an Engineering Physics faculty member at Hope College (1991 – 1996). At KU, Dr. Luchies has served as the Interim Director of the Human Performance Laboratory at the KU Medical Center (2004 – 2006) and as Academic Director of the Bioengineering Graduate Program (2007 – 2010). He holds a secondary faculty appointment in the Department of Physical Therapy and Rehabilitation Science at the KU Medical Center.

Dr. Luchies' research involves integration of methodologies of mechanical engineering with the biological and medical sciences to study the mechanics of the human musculoskeletal system. Experimental studies, mathematical modeling, and computer simulations are conducted to produce insights into the biomechanics of human balance and motor control related to aging and neurological disease. Dr. Luchies collaborates with colleagues in the KUMC Center on Aging, Movement Disorders Clinic, and Molecular and Integrative Physiology. He is a member of the Society of Neuroscience.

Lorin P. Maletsky
Associate Professor
Associate Dean for Undergraduate Studies, School of Engineering
Ph.D. Purdue University, 1999

Dr. Maletsky began teaching at the University of Kansas in 2000. His courses are in the design and mechanics tracks of the curriculum, and he also offers graduate courses in dynamics and manufacturing.

Dr. Maletsky’s research area is machine design and biomechanics, specifically the experimental testing of cadaveric joints using custom-designed physiological loading equipment. Graduates from his laboratory hold positions in a number of the world's largest orthopedic companies, as well as in academia and in other industries. He is a member of the Bioengineering Division of ASME and is also a member of the Orthopedic Research Society and the American Society for Engineering Education.
Robert M. Sorem  
Associate Professor  
Ph.D. University of Kansas, 1991

Dr. Sorem joined the Department of Mechanical Engineering in 1994. He previously worked for Schlumberger Oilfield Services from 1991 to 1994 in Research and Engineering, developing downhole oilfield tools. Dr. Sorem served as Associate Dean for Undergraduate Studies in the School of Engineering for the 2002-2012 Academic Years.

Dr. Sorem's research areas are engineering education, computational mechanics and vehicle dynamics. His work in education is focused on retention strategies and graduation rates. He has advised KU’s Jayhawk Motorsports Formula SAE (Society of Automotive Engineers) Racing Team for 19 years. In 2012 and 2014 Jayhawk Motorsports won the Formula Hybrid – Electric Division and the Formula SAE Lincoln events. In 2009 Dr. Sorem was awarded the Carroll Smith Mentor's Cup by Formula SAE and the Sports Car Club of America (SCCA).

Paulette Spencer  
Deane E. Ackers Distinguished Professor  
Director, Bioengineering Research Center  
Ph.D. University of Missouri-Kansas City, 1993; D.D.S. University of Missouri-Kansas City, 1978

Dr. Spencer joined the Department in 2007. She was previously a faculty member at the University of Missouri-Kansas City School of Dentistry (1998 – 2007) and is a Curators’ Professor Emerita from the University of Missouri. Working with her research team, Dr. Spencer designs, synthesizes, and develops novel biomaterials for the reconstruction of mineralized tissues damaged by disease, age or trauma.

Dr. Spencer's work has been continuously funded by the National Institutes of Health for more than 20 years. She has served as Mentor on 4 NIH-supported career development awards and as Director of a NIH-supported training program. She serves on several editorial review boards, and is a past member of the Center for Scientific Review, NIH (2010 – 2012). She is a Fellow of the American Institute for Medical and Biological Engineering, the Biomaterials Science and Engineering International Union of Societies for Biomaterials Science and Engineering, the American College of Dentists, and the American Association for the Advancement of Science.

Karan S. Surana  
Deane E. Ackers Distinguished Professor  
Ph.D. University of Wisconsin, 1970

Dr. Surana joined the Department in 1984. He had previously worked at Structural Dynamics Research Corporation (1970 – 1973) as a Special Consultant, Engineering Mechanics Research Corporation (1973 – 1978) as Director of Research and Development, and McDonnell Douglas in St. Louis as Principal Consultant. Over this period he was the principal architect, originator and developer of the commercial finite element software systems IDEAS, NISA and FINESSE.

Dr. Surana conducts research in computational mathematics, computational mechanics, and continuum mechanics including development of constitutive theories. His work on the k-version of the finite element method is one of his most notable contributions. Dr. Surana's current research foci include ordered-rate constitutive theories in addition to fundamental and applied topics in computational mathematics. He serves as an Associate Editor for The International Journal for Computational Methods in Engineering Science and Mechanics and The International Journal of Modeling and Simulation. Dr. Surana is a member of International Association for Computational Mechanics and a life member of the American Society of Mechanical Engineers.
Faculty Profiles

Candan Tamerler
Wesley G. Cramer Associate Professor
Ph.D. Bogazici University, 1997

Dr. Tamerler joined the Mechanical Engineering Department in the Fall of 2013 as the Wesley G. Cramer Associate Professor of Mechanical Engineering. She was most recently a Research Professor and Assistant Director of the Genetically-Engineered Materials Science & Engineering Center at the University of Washington. Previously, she was a Full Professor at Istanbul Technical University, and served as the Chair of the Molecular Biology and Genetics Department at ITU for eight years. While at ITU, Professor Tamerler founded the Molecular Biology and Biotechnology Research Center, a multi-disciplinary initiative involving faculty members from Chemical Engineering, Materials Science and Engineering, Mechanical Engineering, Chemistry, Molecular Biology, and Physics.

Dr. Tamerler serves on multiple editorial boards and is one of only 120 Principal Members of the Turkish Academy of Sciences.

Peter W. TenPas
Associate Professor
Ph.D. Iowa State University, 1990

Dr. TenPas joined the Mechanical Engineering Department in 1987. Early in his career he worked as a research engineer in the fluid mechanics research group at the Trane Company Corporate Research Laboratory. While at KU, he has served as the Director of the KU Industrial Assessment Center and the KU Energy Analysis and Diagnostic Center. Under these U.S. Department of Energy supported programs, Dr. TenPas led student teams to assess the potential of energy conservation and waste reduction opportunities at many industrial facilities in the region.

Dr. TenPas’ research interests are in the areas of Computational Mechanics and Computational Fluid Dynamics. He has published in the areas of viscous flow with heat transfer, compressible flow, aero-acoustics, and visco-elastic fluids. He is a member of the American Institute of Aeronautics and Astronautics, the American Society of Engineering Education, and the American Society of Mechanical Engineers.

Sara E. Wilson
Associate Professor
Director, Bioengineering Program
Ph.D. Massachusetts Institute of Technology, 1999

Dr. Wilson joined the Department in 2001. In addition, she has a courtesy appointment in Physical Therapy and Rehabilitation Sciences at the KU Medical Center. Prior to joining KU, she was a postdoctoral researcher at the University of Virginia.

Dr. Wilson conducts research in the neuromuscular control of human motion using engineering principles from control theory and dynamics. She has studied the effects of occupational exposures such as vibration on the lumbar spine and low back disorders. She is also involved in the development of medical devices used in physical therapy, obstetrics and internal medicine. She has served as an Associate Editor for the Journal of Applied Biomechanics and is currently the Chair of the Executive Committee of the ASME Bioengineering Division. Dr. Wilson is a member of the American Society of Mechanical Engineers, the American Society of Biomechanics, and the American Society for Engineering Education.
Xinmai Yang
Associate Professor
Ph.D. Boston University, 2003

Dr. Yang joined the Department of Mechanical Engineering in 2008. He was previously a postdoctoral research associate at Washington University in St. Louis (2006 – 2008). He has also worked at the National Center for Physical Acoustics at the University of Mississippi as a postdoctoral fellow. Dr. Yang conducts research in photoacoustic imaging and biomedical applications of ultrasound.

Dr. Yang’s research focuses on early cancer detection, as well as molecular imaging and brain functional imaging with both optical and/or ultrasound methods. His research is funded by the National Institutes of Health. Dr. Yang is a member of Society of Photographic Instrumentation Engineers, and is an associate member of the Acoustical Society of America.

Bedru Yimer
Professor
Ph.D. University of Dayton, 1979

Dr. Yimer joined the Mechanical Engineering Department in 1979. He was previously a member of the Ethiopian Air Force as a Fighter Pilot (1963 – 1972) and a Lecturer at the United States Air Force Academy (1972 – 1974).

Dr. Yimer’s research is in the general area of thermal-fluids science and systems. His work has included numerical studies of air-cooled thermal systems, as well as the experimental development and evaluation of planar heat pipes for cooling electronic devices. His primary area of research is the analytical and experimental study of phase change energy storage and recovery systems. Dr. Yimer’s work in this area has included the analytical development and modeling of multi-dimensional, transient phase change energy storage behavior accounting for the effects of internal thermal radiation.
The Jimmy Green Statue, The University of Kansas, Bronze by Daniel Chester French, 1924

James Woods Green, first dean of the KU School of Law (right) conversing with an engineering student (left). This is believed to be the world’s first larger-than-life sculpture of either a university faculty member or a university student.
Journal Articles (excludes online pre-publications)

Theodore L. Bergman


Christopher Depcik


Journal Articles

(Cepcik cont.)


**Ronald L. Dougherty**


**Huazhen Fang**


Journal Articles

Kenneth J. Fischer


Elizabeth A. Friis


Sarah L. Kieweg


Xianglin Li


**Lin Liu**


L. Liu, G.Y. Kim, A.C. Hillier and A. Chandra, “Microstructural and Electrochemical Impedance Study of Nickel–Ce_{0.9}Gd_{0.1}O_{1.95} Anodes for Solid Oxide Fuel Cells Fabricated by Ultrasonic Spray Pyrolysis,” *Journal of Power Sources*, vol. 196, pp. 3026-3032, 2011.

**Carl W. Luchies**


Journal Articles

Lorin P. Maletsky


Paulette Spencer


Journal Articles

(Spencer cont.)


Karan S. Surana


Journal Articles

Candan Tamerler


Journal Articles

Sara E. Wilson


Xinmai Yang


• Books and Book Chapters
• Editorial Positions
• Major Invited and Keynote Presentations
• Honors, Awards, Patents, and Major Professional Service

Moses (10 foot tall, 1.5 ton bronze by Elden Teflitt, 1982) and the Burning Bush (stained glass, approximately 20 feet by 30 feet, by Charles Marshall, 1982), The University of Kansas.
Books and Book Chapters

Theodore L. Bergman


Paulette Spencer


Karan S. Surana


Candan Tamerler


Editorial Positions

Theodore L. Bergman


Ronald L. Dougherty


Kenneth J. Fischer


Newsletter Editor, Bioengineering Division, ASME, 2011 – 2015.

Elizabeth A. Friis


Paulette Spencer


Karan S. Surana


Editorial Positions

Candan Tamerler


Associate Editor, *Nano Communications*, 2013 – present.


Associate Editor, *Nano Communications*, 2012 – present.


Sara E. Wilson


Major Invited and Keynote Presentations

Candan Tamerler


Major Invited and Keynote Presentations

(Tamerler cont.)

Distinguished Department Lecturer, "Bio-enabled Materials through Biomimetics Molecular Design," University of Southern California, Mork Family Department of Chemical Engineering and Materials Science, Los Angeles, October 2013.


Invited Presentation, "Multifunctional Protein Enabled Patterning on Ferroelectric Materials," Materials Science and Technology Conference (MS&T12), Next Generation Biomaterials Symposium, Pittsburgh, October 2012.


Invited Presentation, "Biology Enabled Nanotechnology," University of Potsdam & Go Institute Collaborative Workshop, Potsdam, February 2012.


Major Invited and Keynote Presentations

(Tamerler cont.)


Invited Presentation, “Peptide Based Nanoprobes for Targeting,” Nanobiosensing Workshop, Fraunhofer Institute, Potsdam, April, 2011.


Elizabeth A. Friis


Invited Presentation, “Roles and Responsibilities of the NSF I-Corp Principal Investigator,” NSF I-Corp Introduction to Mexico, Mexico City, August 2014.

Sarah L. Kieweg


Paulette Spencer


Karan S. Surana


Xinmai Yang


Honors, Awards, Patents, and Major Professional Service

Theodore L. Bergman

Fellow, American Society of Mechanical Engineers.

Member, Scientific Council, International Centre for Heat and Mass Transfer.

Corresponding Member, Connecticut Academy of Science and Engineering.

Christopher Depcik

Rising Star Award, Kansas Association for Conservation & Environmental Education, 2013.

Associate Board Member, ASME Internal Combustion Engine Division (elected 2013).

Ronald L. Dougherty

Fellow, American Society of Mechanical Engineers.

Kenneth J. Fischer

Joint and Spine Biomechanics Theme Leader, Solid Mechanics Committee, Bioengineering Division, American Society of Mechanical Engineers, 2014 – present.

Member, Nominating Committee, Orthopaedic Research Society (2012 – 2013).


Elizabeth A. Friis

Secretary-Treasurer Elect, Society for Biomaterials, 2013 – present.

Invited Member, National Institutes of Health: National Institute of Arthritis and Musculoskeletal and Skin Diseases, Special Emphasis Panel, Study Section on Orthopaedics, 2013 – 2014.

Sarah L. Kieweg


Invited Member, Bill and Melinda Gates Foundation Think Tank on Drug Delivery Systems for HIV Prevention, 2013.

Honors, Awards, Patents, and Major Professional Service

Paulette Spencer

Fellow, Biomaterials Science and Engineering (FBSE), International Union of Societies for Biomaterials.

Fellow, American Association for the Advancement of Science.

Fellow, American Institute for Medical and Biological Engineering.

Selected for 2014 – 15 Fulbright U.S. Scholar Award to Brazil.


Invited Member, National Institutes of Health: National Institute of Dental and Craniofacial Research, Special Emphasis Panel, Extramural Loan Repayment Applications, 2014.

Member, American Association for the Advancement of Science, Electorate Nominating Committee, Section on Dentistry and Oral Health Sciences, 2013 – 2016.


Karan S. Surana

Life Member, American Society of Mechanical Engineers.

Fellow, American Society of Mechanical Engineers.


Candan Tamerler


Principal Member, Turkish National Academy of Science.

Visiting Professor Fellowship Award, Green Mobility Collaborative Research Center, Nagoya University, 2012.

Sara E. Wilson

Secretary, Executive Committee, Bioengineering Division, American Society of Mechanical Engineers, 2014 - 2015.
• Industry-Sponsored Capstone Projects
• Special Accolades

Capstone of Spooner Hall, Unknown Artist, 1894, The University of Kansas.
Industry-Sponsored Capstone Projects*

**Altec Well-to-Wheel Analysis**  
**Sponsor:** Altec Inc.  
Advisor: Peter TenPas  
Industrial Liaison: Mike Moore  
Instructor: Chris Depcik  
Student Team: Alejandro Velez, Michael Wickersheim, Jordan Powell

**Automated Flange Strength Tester**  
**Sponsor:** BD Medical, Pharmaceutical Systems  
Industrial Liaison: Kurt Palik  
Advisor: Ron Dougherty  
Instructor: Ron Dougherty  
Student Team: Edgar Acevedo-Pando, Shannon Faucett, Rick Gan, David Hoops, Robert McCarty, Meghan Park

**Automated Loader for Flange Strength Tester**  
**Sponsor:** BD Medical, Pharmaceutical Systems  
Industrial Liaison: Kurt Palik  
Advisor: Ron Dougherty  
Instructor: Ron Dougherty  
Student Team: Stone Dodson, Derek Ellis, Jimmy Jenkins, Logan Thorup

**Auxiliary Fume Hood Design**  
**Sponsor:** HEMCO  
Industrial Liaison: Ron Hill and Dave Campbell  
Advisor: Ron Dougherty  
Instructor: Ron Dougherty  
Student Team: Robert Devine, Alex Modency, Russell Hahn

**Auxiliary Fume Hood Re-design**  
**Sponsor:** HEMCO  
Industrial Liaison: Ron Hill and Dave Campbell  
Advisor: Peter TenPas  
Instructor: Ron Dougherty  
Student Team: Nick Apel, Adam Hugo, Thy Nguyen

**Black & Veatch Smart Communities**  
**Sponsor:** Black & Veatch  
Advisor: Sarah Kieweg  
Industrial Liaison: Keith Cummer  
Instructor: Chris Depcik  
Student Team: Tommy Cheng, Will Chertoff, Matthew Cole, Nathan Klein

**Black & Veatch Smart Communities – Year 2**  
**Sponsor:** Black & Veatch  
Industrial Liaison: Bill Roush  
Advisor: Lin Liu  
Instructor: Chris Depcik  
Student Team: Drew Humphreys, Daniel Muccinco, Dillon Shupe, Myette Simpson

**Bone Graft Delivery System – Expansion Lumbar Interbody Fusion**  
**Sponsor:** SpineEX  
Industrial Liaison: Aly Boyer  
Advisor: Xinmai Yang  
Instructor: Ken Fischer  
Student Team: Rusul Al-Ani, Alexis Grimm, Katharine Holland

**Clinical Rotary Knee Laxity Assessment Device**  
**Sponsor:** DePuy  
Industrial Liaison: Chadd Clary  
Advisor: Lorin Maletsky  
Instructor: Ken Fischer  
Student Team: Thomas Dunn, John Fredrickson, Holly Grant

**Composite Suspension Arm for Mass-market Passenger Car**  
**Sponsor:** Honda R&D Americas  
Industrial Liaisons: Josh Johnson and Chris Dundon  
Advisor: Robb Sorem  
Instructor: Ron Dougherty  
Student Team: Royce Kilgore, Jason Morris, Bailey Spickler, Setha (Alex) Sanoubane

**ELIF (Expansion Lateral Interbody Fusion) Tool**  
**Sponsor:** SpineEX  
Industrial Liaison: Rob Ownbey  
Advisor: Xinmai Yang  
Instructor: Ken Fischer  
Student Team: Henry Clever, Benjamin Wong, Samuel Mills

**Evaluation and Implementation of Lithium-based Battery Chemistries**  
**Sponsor:** Altec Inc.  
Advisor: Huazhen Fang  
Industrial Liaison: Ash Dalal  
Instructor: Chris Depcik  
Student Team: Luke Foiles, Blake Hamilton, Austin Kipp

**Fan Balancing Equipment for a Manufacturing Environment**  
**Sponsor:** SPX Cooling Technologies  
Industrial Liaison: Robert Lewis  
Advisor: Carl Luchies  
Instructor: Ron Dougherty  
Student Team: Hayden Maples, Stephen McKinney, Patrick Morphew, Dylan Shmalberg

**FOG (Fats, Oils, Greases) Separation and Detection System**  
**Sponsor:** Zero Waste Technologies  
Industrial Liaison: Laurent Vannest and Todd Gee  
Advisor: Ron Dougherty  
Instructor: Ron Dougherty  
Student Team: Gongyi Chen, Christos Romanas, Michael Yunker
Industry-Sponsored Capstone Projects

**Fume Hood Blower Testing/Design**
*Sponsor: HEMCO*
Industrial Liaison: Ron Hill and Dave Campbell  
Advisor: Bedru Yimer, Ron Dougherty  
Instructor: Chris Depcik  
Student Team: Cory Bondurant, James Clayton, Alan Kidd, Jacob Wernel

**IAQP Program Calculator**
*Sponsor: Engineered Air*
Industrial Liaison: Dan Glendon  
Advisor: Tricia Bergman  
Instructor: Ron Dougherty  
Student Team: Cole Bittel, Ben Dieker, Jack Hartman, Kevin Walbridge

**Improving Energy Efficiency in Research Laboratories**
*Sponsor: HEMCO*
Industrial Liaison: Ron Hill and Dave Campbell  
Advisor: Ron Dougherty and Peter TenPas  
Instructor: Ron Dougherty  
Student Team: David Bedford, Derek Good, Michael Just

**Improvements to an Existing Wire Shear Testing Device**
*Sponsor: WireCo WorldGroup*
Industrial Liaison: Bamdad Pourladian  
Advisor: Karan Surana  
Instructor: Ron Dougherty  
Student Team: Henry Cameron, Patrick Loftus, Vanessa Sillman

**Instrument to Measure Static Electricity Levels in Thermoformed Cups**
*Sponsor: Berry Plastics*
Industrial Liaison: Brian Good  
Advisors: Lin Liu and Ted Bergman  
Instructor: Ron Dougherty  
Student Team: Cameron Flora, Justin Male, Tyler Underwood

**LS2Unit, Life Support System Unit**
*Sponsor: Shor-Line Manufacturing Company*
Industrial Liaison: Larry Haake  
Advisor: Ken Fischer  
Instructor: Ken Fischer  
Student Team: Chase Weber, Kyle Nelson, Chris Lawhorn

**Mold Cart for SMED**
*Sponsor: Berry Plastics*
Industrial Liaison: Brian Good  
Advisors: Terry Faddis and Robb Sorem  
Instructor: Ron Dougherty  
Student Team: Clint Chastain, Kevin Gallagher, Nick Livingston, Zach Proacak

**Oral Fluid Collection Time**
*Sponsor: Quest Diagnostics*
Industrial Liaison: Matt Resch  
Advisor: Candan Tamerler  
Instructor: Ken Fischer  
Student Team: Taylor Joyce, Deanna Marks, Scott Snyder

**Oral Fluid Return Packaging Solution**
*Sponsor: Quest Diagnostics*
Industrial Liaison: Matt Resch  
Advisor: Ted Bergman  
Instructor: Ron Dougherty  
Student Team: Norapat (Dominic) Prapassorn, Zhouzhou Xu, Alex Stanton

**Quick Change Hopper**
*Sponsor: BD Medical, Pharmaceutical Systems*
Industrial Liaison: Kurt Palik  
Advisor: Sara Wilson  
Instructor: Ron Dougherty  
Student Team: Danny Haik, Heng (Gary) Liu, Elijah Truitt

**Semi-automated Shield Pull-off A**
*Sponsor: BD Medical, Pharmaceutical Systems*
Industrial Liaison: Kurt Palik  
Advisor: Carl Luchies  
Instructor: Ron Dougherty  
Student Team: Cedric Leimkuehler, Kevin Sitek, Karli Somers

**Semi-automated Shield Pull-off B**
*Sponsor: BD Medical, Pharmaceutical Systems*
Industrial Liaison: Kurt Palik  
Advisor: Lisa Friis  
Instructor: Ron Dougherty  
Student Team: You Chen, Jeremiah Karczewski, Krystina Pingel

**Stand-alone Minimally Invasive Intervertebral Spinal Implant System and instruments**
*Sponsor: ARC Surgicals*
Industrial Liaison: Tausif Rehman  
Advisor: Sara Wilson  
Instructor: Ken Fischer  
Student Team: Evan Holcomb, Colton Lowe, Luke Luallin, David Salt

**Stereotactic Brain Probe Guide**
*Sponsor: ARC Surgicals*
Industrial Liaison: Tausif Rehman  
Advisor: Lisa Friis  
Instructor: Ron Dougherty  
Student Team: Jobie Buehler, Misagh Faghan, Brian Goodrich, Keyu (Kirk) Wu
Industry-Sponsored Capstone Projects

Water, Air Interaction Observing Test Cell  
**Sponsor:** SPX Cooling Technologies  
Industrial Liaison: Jidong Yang  
Advisor: Sarah Kieweg  
Instructor: Ron Dougherty  
Student Team: Javier Vizcarra, Tabitha Teo, Pei Liang (Tyler) Leow

*The industry-sponsored capstone projects listed above were initiated between January of 2013 and August of 2014.*

Special Accolades

**Jayhawk Motorsports:** First Place, Formula SAE Nationals, Lincoln (advised by Robb Sorem), 2014.

**KU EcoHawks:** Second Place, Department of Energy Collegiate Wind Competition, (advised by Christopher Depcik), 2014.


Sponsors

Research

Army Research Office  
DePuy Synthes Joint Reconstruction  
Institute for Advancing Medical Innovation  
Kansas Soybean Commission  
Kauffman Foundation  
National Institutes of Health  
National Institute for Biomedical Imaging and Bioengineering  
National Science Foundation  
Neware Technology  
Nuclear Regulatory Commission  
TUBITAK  
University of Kansas Ophthalmology Department  
University of Kansas Transportation Research Institute

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