

Mechanical Engineering Department, University of Kentucky
Research Interests by Faculty

Rodney Andrews, Associate Professor (Joint Appointment), Ph.D., Chemical Engineering, University of Kentucky, 1999 (andrews@caer.uky.edu)

Research interests include activated carbons; adsorbents; environment; hydrogen; materials characterization; nanotube synthesis and applications; pitch production and uses.

Mohamed Hassan Ali, Senior Lecturer, Ph.D., Mechanical Engineering, University of Michigan, 1997 (mihass0@engr.uky.edu)

Research interests include combustion and fire research.

F. Fazleena Badurdeen, Assistant Professor, Ph.D., Industrial Engineering, Ohio University, 2005 (badurdeen@engr.uky.edu)

Research interests include mass customization and application of genetic algorithms in manufacturing.

John R. Baker, P.E., Associate Professor, Paducah Extended Campus Program; Ph.D., Mechanical Engineering, University of Kentucky, 1999 (jbaker@engr.uky.edu)

Research interests include stability analysis and vibration control in metal cutting systems; finite element analysis of rotating machinery; automation of analysis techniques for nonlinear finite element analysis.

Louis M. Brock, Professor, Ph.D., Theoretical and Applied Mechanics, Northwestern University, 1972 (brock@engr.uky.edu)

Research interests include elastic wave propagation, dynamic analyses of contact, fracture, dislocation motion and thermoelasticity.

Keng Hoo Chuah, Assistant Research Professor, Ph.D., Mechanical Engineering, University of Kentucky, 2004 (keng.chuah@uky.edu)

Research interests include scale modeling, fire research and lean manufacturing.

Vincent R. Capece, P.E., Recipient of the H.E. Katterjohn Professorship, Associate Professor; Paducah Extended Campus Program; Ph.D., Mechanical Engineering, Purdue University, 1987 (vcapcece@engr.uky.edu)

Research interests include experimental and computational fluid dynamics of turbomachinery, fluid-structure interaction of lifting surfaces, and gas turbine engine cycles for power generation and aircraft propulsion.

Mark T. Hanson, Associate Professor, Ph.D., Applied Mechanics, Northwestern University, 1989 (hanson@engr.uky.edu)

Research interests include contact and fracture mechanics and their applications to various areas of engineering, tribology, stress analysis resulting from concentrated contacts and the resulting failure mechanisms, effects of material anisotropy and in homogeneity.

David W. Herrin, P.E., Assistant Research Professor, Ph.D., Mechanical Engineering, University of Kentucky, 2000 (herrin@engr.uky.edu)

Research Interests include Acoustics and Vibration; Numerical Methods in Vibro-Acoustics, Boundary Element Methods, Finite Element Modeling.

Donna Hewett, Lecturer, M.S., Mathematics, University of Kentucky, 1979 (dhewett@engr.uky.edu)

I. S. Jawahir, Hardymon Chair and Professor, Ph.D., Manufacturing Engineering, University of New South Wales, Sydney, Australia, 1986 (jawahir@engr.uky.edu)

Research interests include predictive modeling and optimization of machining processes; assessment of machining performance (tool-life, chip-breakability, surface roughness, etc.), characterization of machining systems, A.I. applications in design and manufacturing.

Haluk Karaca, Assistant Professor, Ph.D., Mechanical Engineering, Texas A&M University, 2007
(karaca@engr.uky.edu)

Research interests include processing-microstructure-mechanical property relationships in metals, (ferro)magnetic and conventional shape memory alloys, phase transformations, twinning and slip in single crystals and severe plastic deformation.

Marwan K. Khraisheh, Secat-J.G. Morris Aluminum Professor; Ph.D., Mechanical Engineering, Washington State University, 1996 (khraisheh@engr.uky.edu)

Research interests include experimental characterization and constitutive modeling of the deformation of advanced materials, superplasticity and superplastic forming, advanced metal forming operations, machining dynamics, crack initiation under mixed mode loading.

Thomas W. Lester, P.E., Professor and Dean of the College of Engineering; Ph.D., Mechanical Engineering, Purdue, 1974 (lester@engr.uky.edu)

Research interests include rotary kiln incineration; hazardous waste incineration; chemical mechanisms of soot nucleation; the kinetics and mechanisms of coal combustion.

Tianxiang Li, Assistant Research Professor, Ph.D., Mechanical Engineering, University of Kentucky, 1999
(txli1@engr.uky.edu)

Research interests include combustion and propulsion.

Y. Charles Lu, Assistant Professor, Ph.D., Mechanical and Materials Engineering, University of Western Ontario, 2000 (chlu@engr.uky.edu)

Research interests include solid mechanics; micromechanics and nanomechanics; materials; polymers, elastomers and composites; finite element modeling and design; vibration.

Alan T. Male, P.E., Professor, Ph.D., Industrial Metallurgy, University of Birmingham, 1962
(atmale@engr.uky.edu)

Research interests include friction, lubrication and process variable/microstructure/material property effects in metalworking operations; rapid prototyping of sheet metal shapes using plasma-jet heating alone.

James M. McDonough, Professor, Ph.D., Engineering, University of California, Los Angeles, 1980
(jmmcd@uky.edu)

Research interests include computational fluid dynamics (CFD) and heat transfer; nonlinear dynamical systems; cooling of gas turbine blades; simulation of forest fires; development of turbulence simulation and modeling techniques utilizing dynamical systems theory to predict interactions of turbulence with other physical phenomena.

M. Pinar Mengüç, Engineering Alumni Association Professor, Ph.D., Mechanical Engineering, Purdue University, 1985 (menguc@engr.uky.edu)

Research interests include modeling and application of radiation transfer principles in combustion as well as biological systems; development of detailed diagnostic systems for particle and cell characterization; study of radiation transfer as an adaptive energy control tool.

William E. Murphy, P.E., PJC Professor and Director of University of Kentucky Extended Campus Engineering Program in Paducah, KY; Ph.D. Purdue University, 1980 (wmurphy@engr.uky.edu)

Research interests include heating, ventilating, and air conditioning systems, especially in geothermal applications.

Johné M. Parker, Associate Professor, Ph.D., Mechanical Engineering, Georgia Institute of Technology, 1996
(jparker@engr.uky.edu)

Research interests include automation and control of manufacturing systems; flexible automation; machine vision system design for manufacturing applications; assessment of surface appearance for specular coatings using vision; integration of human perception into automated surface appearance assessment.

Patrick K. Poole, Senior Lecturer, Ph.D., Mechanical Engineering, University of Maryland, 1990
(pkpoole@engr.uky.edu)

Research interests include fluid dynamics; underwater work systems; life-support systems; naval architecture; advanced power conversion.

Keith E. Rouch, P.E., Professor; Ph.D., Systems Engineering, Marquette University, 1977 (rouch@engr.uky.edu)

Research interests include application of finite element, modal analysis, and other numerical and experimental techniques in the mechanical design process; rotor dynamics and foundation interaction; control of chatter during machining.

Kozo Saito, Tennessee Valley Authority Professor and Director of IR4TD, D.Eng., Seikei University, Tokyo, Japan, 1980 (saito@engr.uky.edu)

Research interests include experimental combustion studies (flame structure and soot formation); fire research. (building fires, wildland fires, flame spread, fire extinguishing and control); painting technology; scale modeling; lean manufacturing.

Abraham Salazar, Associate Research Professor, Ph.D., Mechanical Engineering, University of Kentucky, 1998, (ajsala00@pop.uky.edu)

Research Interests include Computational Fluid Dynamics; Incompressible and compressible viscous flows, including heat transfer, multi-phase flow, chemical reactions, turbulence; painting technology.

T. Michael Seigler, Assistant Professor, Ph.D., Virginia Polytechnic Institute and State University, 2005 (seigler@engr.uky.edu)

Research Interests include morphing air vehicles; intelligent material systems and structures; vibration; control theory.

Dusan P. Sekulic, Professor and Director of Graduate Studies of Manufacturing Systems Engineering, Dr. Sc. Eng., University of Belgrade, Yugoslavia, 1981 (sekulicd@engr.uky.edu)

Research interests include materials behavior and transport processes in manufacturing; netshape manufacturing processes; modeling; materials processing, manufacturing and thermal design of compact heat exchangers; fundamentals of aluminum brazing; heat transfer augmentation in low Reynolds number flows.

Andrew F. Seybert, P.E., Professor, Ph.D., Mechanical Engineering, Purdue University, 1975 (seybert@engr.uky.edu)

Research interest include acoustics and vibrations; mechanical design and linear systems; development of computer-aided design tools for noise prediction; the use of boundary element techniques in acoustics; the measurement and control of machinery noise.

Suzanne Weaver Smith, P.E., Professor, Lester Professor, Ph.D., Engineering Mechanics, Virginia Polytechnic Institute and State University, 1988 (ssmith@engr.uky.edu)

Research interests include modeling, testing and test/analysis correlation of nonlinear and linear structural dynamic response; system identification and damage location for spacecraft, bridges and other structures and design and control of flexible structures.

Lyndon S. Stephens, P.E., Engineering Alumni Association Professor and Chairman, Ph.D., Mechanical and Aerospace Engineering, The University of Virginia, 1995 (stephens@engr.uky.edu)

Research interests include optimal design and control of precision machines with an emphasis on bearing and sealing systems; magnetic bearings; tribology; computer aided design and finite elements; Design of MicroElectroMechanical Systems (MEMS) for machine components; vibration isolation and cancellation.

Gerry Swan, Assistant Professor (Joint Appointment), Ph.D., Instructional Technology, University of Virginia, Charlottesville, 2004 (gswan@uky.edu)

Research interests include the use of interactive media with instruction and computer managed instruction/research.

Kaveh A. Tagavi, Professor, Ph.D., Mechanical Engineering, University of California, Los Angeles, 1982 (kaveh@engr.uky.edu)

Research interests includes phase change heat transfer; high heat flux; hydrodynamic instability; liquid metal heat transfer; analytical conduction and convection heat transfer; heat transfer in crystal growth; heat transfer in electronic packaging, and metal formation in manufacturing processes.

Christine Trinkle, Assistant Professor, Ph.D., University of California – Berkeley, 2008 (trinkle@engr.uky.edu)

Research interests include microfluidic systems, micro-scale design and fabrication, MEMS, biologically-inspired design and precision machine design.

Horn-Sen Tzou, Professor, Ph.D., Mechanical Engineering, Purdue University, 1983 (hstzou@engr.uky.edu)

Research interests include precision mechatronic systems, "smart" structures and structuronic systems, and opto-mageneto-electro-thermo-elastic-control systems; dynamics and vibration controls of distributed and discrete systems; nonlinear joint dynamics and control; computer-aided design and manufacturing; robotics, sensor/actuator systems, and instrumentation and measurements.

Ting-Wen Wu, Professor and Director of Undergraduate Studies, Ph.D., Engineering Mechanics, The University of Texas at Austin, 1987 (wu@engr.uky.edu)

Research interests include computational acoustics and boundary element methods; muffler and silencer analysis; disk brake squeal prediction; parallel computation.