Aaron Smith

Assistant Clinical Professor
Mechanical Engineering Department
Mississippi State University
smith@me.msstate.edu

EDUCATION

Ph.D., Mechanical Engineering 2012
Mississippi State University, Mississippi State, MS
Dissertation Title: *Modeling and uncertainty analysis of CCHP systems*

B.S., Mechanical Engineering 2008
Mississippi State University, Mississippi State, MS

EXPERIENCE

Associate Clinical Professor 2022 - Present
Mechanical Engineering Department
Mississippi State University
Courses Taught:

- ME 1111 Introduction to Mechanical Engineering
- ME 2133 Modeling and Manufacturing
- ME 3113 Engineering Analysis
- ME 3423 Mechanics of Machinery
- ME 3513 Thermodynamics I
- ME 3523 Thermodynamics II
- ME 3613 System Dynamics
- ME 4301 Thermal Fluids Lab
- ME 4443 Mechanical System Design
- ME 4990 Case Studies in Engineering Design

Assistant Clinical Professor 2016 - 2022
Mechanical Engineering Department
Mississippi State University

Senior Engineer 2013 - 2015
Eaton Aerospace, Jackson, MS,
Research and Development
Selected Projects:

- Novel motor pump control methodology (1 patent)
- Supervisory system control logic (1 patent)
- Flight control System Safety Assessment (SSA)
- Thermal Analysis of hydraulic power pack
- High performance journal bearing design
- Design for Six Sigma
- Detailed Design and development of radial piston pump (1 patent)

Graduate Teaching Assistant **2011 - 2012**
Mississippi State University
Course Taught
- ME 3613 System Dynamics

Graduate Research Assistant **2009 - 2011**
Mississippi State University
Combined Cooling Heating and Power (CCHP) Systems

HONORS AND AWARDS

Schillig Special Teaching Projects Award, 2020
A Steam Engine Rediscovery Experience for Mechanical Engineers
Amount awarded: $2400

Mechanical Engineering Outstanding Faculty Teacher Award, 2022

Innovation Award, Eaton Aerospace, 2015

Green Belt in Design for Six Sigma Certification, 2015

Mississippi Space Grant Consortium Fellowship, 2009-2011

PATENTS

Smith, A., et al., "Hydraulic Radial Piston Device," US9932827B2, Published, April 3, 2018.

Smith, A., Frischemeier, S., and Skinner, J., "Supervisory Control and Monitoring Logic for Zonal Hydraulic System," US10093408B1, Published, 2018.

Skinner, J. and **Smith, A.**, "Electronic Control of a Rotary Fluid Device," US20160265520A1, Published, 2016

EDUCATIONAL PUBLICATIONS

Smith, J. A., Knizley, A., Green, M. (2023). "A survey to assess the importance of analysis in an undergraduate Mechanical Engineering curriculum." 2023 American Society of Engineering Education, Southeastern Section, Conference.

Smith, J. A. (2022). "A New Special Topics Course in Mechanical Engineering: Invention Case Studies." ASEE Southeastern Section Conference 2022.

Smith, A., "Applying a Lecture Structuring Method for Teaching Abstract Concepts in Engineering" 2021 ASEE Southeastern Section Conference, 2021.

Smith, A., "Using Science and Engineering History to Increase Engagement and Conceptual Learning," *2020 ASEE Southeastern Section Conference,* 2020.

Smith, A., "Efforts to build student engagement in an engineering analysis course in mechanical engineering," *2019 ASEE Southeastern Section Conference,* 2019.

Smith, A., and Brauer, S., "Use of Kahoot! game for increased student motivation and understanding in a Thermodynamics course," *2018 ASEE Southeastern Section Conference,* 2018.

Smith, A., Knizley, A, and Luck, R., "A product dissection project designed for student motivation and retention in an introduction to engineering course," *2017 ASEE Zone 2 Conference*, 2017.

Knizley, A., Luck, R., and **Smith, A.**, "Multi-Disciplinary Approach to an Undergraduate Engineering Analysis Course," *2017 ASEE Zone 2 Conference*, 2017.

ENGINEERING PUBLICATIONS

Mahajan, G., Cho, H., **Smith, A.**, and Thompson, S., "Experimental Analysis of Atypically Long Finned Oscillating Heat Pipe for Ventilation Waste Heat Recovery Application," Journal of Thermal Sciences, 2019.

Cho, H., **Smith, A.**, Luck, R., and Mago, P., "Transient Uncertainty Analysis in Solar Thermal System Modeling," *Journal of Uncertainty Analysis and Applications*, 2017.

Skinner, J., **Smith, A.**, Frischemeier, S., and Holland, M., "Advancements in Hydraulic Systems for the More Electric Aircraft," MEA 2015, Toulouse, France, 2015.

Smith, A., Luck. R., and Mago, P., "Integrated parameter estimation of multi-component thermal systems with demonstration on a combined heat and power System," ISA Transactions, 2012.

Yun, K., Luck, R., Mago, P. and **Smith, A.**, "Analytic solutions for optimal power generation unit operation in combined heating and power systems" *ASME Journal of Energy Resource Technology*, 2012.

Smith, A., Fumo, N., Luck, R., and Mago, P., "Robustness of a methodology for estimating hourly energy consumption of buildings using monthly utility bills." *Energy & Buildings*, Vol. 43, 2011.

Smith, A., Luck, R., and Mago, P., "Analysis of a combined cooling, heating, and power system model under different operating strategies with input and model data uncertainty." *Energy & Buildings*, Vol. 42, 2010.

Smith, A., Yun, K., and Thomas, R., "Optimal Power Generation Unit Sizing for Combined Heating and Power Systems with Uncertain Loads and Fuel/Electricity Prices." ASME 2011 5th International Conference on Energy Sustainability.

MENTORING

PhD Students as Primary or Co-Advisor (2)

- Christopher Pilmaier, "CFD modeling of heat transfer in liquid metal flows"

Master's as Primary Advisor (3)

- Bahiy Watson, "Developing mechatronics trainers for pre-engineering curriculum"
- Hamza Oussous, "Design and manufacturing of a torque testing instrument for Milwaukee rachets"
- Sarah Warren

Graduate Students as Committee Member (3)

- Morgan Green, PhD student, "Development of Professional skills in Mechanical Engineering Students"
- Ann Bailey, non-thesis master's student in Mechanical Engineering
- Marouane, Jarachi

SERVICE

Professional Service

American Society of Engineering Education – SE section

- Officer – Secretary K-12 outreach committee (2018)
- Officer – Vice Chair K-12 outreach committee (2019)
- Officer –Chair K-12 outreach committee (2020)

- Officer – Vice Chair, Instructional Committee (2023)
- Officer – Chair, Mechanical Division Committee (2023)
- Conference session moderator (2018, 2020, 2023)
- Student poster session judge (2016)

American Society of Mechanical Engineers – Member

Article Reviewer
- ISA Transactions
- ASEE conference
- ASME Power and Energy Conference

College Service

Search committee chair –MSU Coast Office Associate (2018)

Search committee member –MSU Coast Office Associate (2020)

MSU coast campus development support
- Founding ME Faculty member
- Community College and HS recruiting (12+ events)
- Supported and spoke in local news spotlight on coast program
- Orientation support (5 events)
- Planning and support for classroom development, 2016
- Planning and support for classroom and lab space remodeling, 2017
- Lab equipment planning, 2016-2017
- Submitted UCCC technical change request for all coast classes
- Adjunct faculty support
- Coast class schedule planning
- Coop and Career services event planning
- Coast ABET meeting coordination
- Equipment inventory support

Departmental Service

- Faculty advisor for ASME coast chapter, 2017 - Present
- Editor for MSU coast alumni newsletter, 2019 - Present
- Search committee member – Assistant Clinical Professor, 2017
- Thermodynamics Course Standardization Committee, 2017 - Present
- Mechanical Systems Course Standardization Committee, 2017 - Present
- System Dynamics Course Standardization Committee, 2017 - Present
- Laboratory Course Standardization Committee, 2017 - 2020
- Undergraduate Committee, 2018 – Present
- Undergraduate Student Advising

PROFESSIONAL DEVELOPMENT

Intentional Course Design and Assessment, CTL Maroon Academy, 2023

Active Learning for Student Engagement, CTL Maroon Academy, 2023

Online Teaching 101: Best Practices in Online Education, CTL, 2022

Machining Training, MGCCC, 2022

New Faculty Teaching Academy, CTL, 2021.
5 talks were given related to teaching best practices:

Teaching Portfolio Workshop, CTL. 2021.
4 talks were given related to building a teaching portfolio:

The Three Columns of Teaching, CIRCE, 2020

Essentials of Effective Teaching, ClassicalU, 2020