



MISSISSIPPI STATE UNIVERSITY™



- ❖ Established in 1878
- ❖ Land-grant University
- ❖ > 23,000 Undergraduate Students
- ❖ > 4,100 Graduate Students
- ❖ "Comprehensive Doctoral Research University with R1 Very High Research Activity" by the Carnegie Foundation

ICET Training for Graduate Students

- ❖ **ASME Code on Nuclear Air and Gas Treatment (AG-1)**
- ❖ **Nuclear Quality Assurance (NQA-1) Training**
 - Procedure Development
 - Test Control
 - Control of Measurement and Test Equipment
 - Document Control and Review
- ❖ **Filter Testing**
 - Kinetic Theory of Gases
 - Particle Motion and Size Distributions
 - Brownian Motion and Diffusion
 - In-place Filter Testing (Isokinetic Sampling, Filter Efficiency, Pressure Drop, and Mass Concentration)
 - Measurement of Velocity, Flow Rate, and Pressure
 - Test Stand Development
 - Custom-built Aerosol Generators
 - Filter Autopsy (Thermogravimetric Analysis, Tensile Strength Test, and Scanning Electron Microscopy (SEM) Analysis)
- ❖ **Aerosol Measurement Instruments**
 - Laser Aerosol Spectrometer (LAS)
 - Scanning Mobility Particle Sizer (SMPS) Spectrometer
 - Aerodynamic Particle Sizer (APS)
 - Electrical Low Pressure Impactor (ELPI)



MISSISSIPPI STATE UNIVERSITY™
DEPARTMENT OF MECHANICAL ENGINEERING

- ❖ > 900 Undergraduate Students (ABET Accredited Program)
- ❖ > 140 Graduate Students
- ❖ > 20 Faculty Members
- ❖ Relevant Graduate Courses

Nuclear Air and Gas Filtration	Experimental Procedure
Aerosol Measurement Techniques	Compressible Flow and Turbomachinery
Air Conditioning	Intermediate Fluid Dynamics
Classical Thermodynamics	Intermediate Heat Transfer
Energy Systems Design	Viscous Flow
Computational Fluid Dynamic	Theory of Continuous Media

ICET Organization Chart of Graduate Research Program



Jaime Rickert
Director of ICET

Heejin Cho
Associate Director of Graduate Research at ICET
TVA Associate Professor of Mechanical Engineering

Spencer Phillips

Research Engineer at ICET
Ph.D. Student
Mechanical Engineering

Challenging HEPA Filters with Smoke: Current Capabilities and Testing at ICET

Gentry Berry

Ph.D. Student
Mechanical Engineering

A Review of Technologies and Methods to Address the Spread of COVID-19 in Ventilation Systems and Enclosed Environments

Ivan Beckman

Staff Engineer at U.S. Army ERDC
Distance Ph.D. Student
Mechanical Engineering

Development of Digital Twin Replicas for Computational Analysis of Nonwoven Nanofibrous Air Filter Media

Adam Parsons

MS Student

Titus Roger
Undergraduate Student

Design and Characterization of a Modular Filter Test Stand

ICET Graduate Research Projects

- ❖ Evaluation of HEPA Filters and Other Technologies to Enhance Nuclear Safety in the Defense Waste Complex, Sponsored by US DOE, Contract Number: DE-EM0003163.
- ❖ HEPA Filter Prototype Testing, Sponsored by Bechtel National, Inc., Subcontract Number: 24590-CM-HC4-MKH0-00001