MODELING AND SIMULATION OF HEAT TRANSFER AND THERMOFLUIDIC SYSTEMS WITH SIMSCAPE FLUIDS

March 9th, 2026 (from 9 AM to 1 PM)

at ASTFE TFEC2026 Conference in person at Arizona State University and online virtual in Whova/Zoom

www.astfe.org/courses/mshsf2026/

System-level computational simulation strikes a balance between fidelity and computational cost, which can be crucial for modeling multiscale/multiphysics thermofluidic systems. Join us for a hands-on workshop for computational modeling and simulation of heat transfer and thermofluidic systems. By the end of this workshop, you will have the working experience of creating such systems in Simscape Fluids and using them for engineering design and implementation. Attendees are encouraged to bring their laptops to the session. A workshop license for MathWorks products will be shared with attendees before the conference.

WHO SHOULD ATTEND

This course would help students with a theoretical knowledge of thermodynamics, heat transfer, or fluid mechanics to simulate a wide variety of thermofluidics systems. Educators can use these accessible tools to teach related topics in class or to enhance their lab course with the digital versions of the experiments. For researchers and engineering professionals, the extended capabilities of MATLAB and Simulink enable them to connect system-level models to a variety of control, optimization, and development workflows.

REGISTRATION

- **Fee: $100**
- **Registration will be limited to 50 participants**
- **A certificate will be given upon completion of the course**

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WORKSHOP INSTRUCTORS

Mehdi Vahab

Mehdi Vahab is the Academic Manager for Mechanical and Aerospace Engineering at MathWorks. He specializes in physical and computational modeling for fluid and thermal systems. Before MathWorks, he developed numerical methods for multiphase systems and phase-change dynamics, applied to problems like heat transfer in pool boiling, hypersonic vehicle thermal management, and snow melting in open waters. At MathWorks, he assists researchers, faculty, and students by finding better solutions for their research and teaching challenges.

Jon Loftin

Jon Loftin is a Senior Customer Success Engineer at MathWorks. Jon's background is in mathematics. More specifically, implementing mathematics in a computer. He holds degrees in mathematics: a BS from Southern Arkansas University, a MS from the University of Arkansas, and a Ph.D. from Texas Tech University. He has had years of teaching experience, from teaching at the Naval Nuclear Power School to teaching as an Assistant Professor. Jon's research focus is on building efficient integration techniques in finite element methods.

WORKSHOP

Module 1: Introduction to Simulink, Simscape, and Simscape Fluids

Module 2: Fundamentals Simulation: Heat transfer through solid geometries

Module 3: Fundamentals Simulation: Thermal exchange in piping systems

Module 4: Applied Systems: Heat exchanger modeling

Module 5: Applied Systems: EV battery cooling system design

Module 6: Applied Systems: Importing fluid properties from REFPROP/CoolProp

Module 7: Advanced topics: Matching heat exchangers with performance data

Module 8: Advanced topics: Simulating complex geometries and varying operating condition