ME401 Syllabus

Instructor: Alan Weston
Office: EGRB110

I. Department, Number, and Title of Course: Mechanical Engineering and Energy Processes, ME 401 (1), Thermal Measurements Laboratory

II. Course (catalog) Description: Study of basic measurements used in the thermal sciences. Calibration techniques for temperature and pressure sensors. Thermal measurements under transient and steady-state conditions. Applications include conduction, convection and radiation experiments, uncertainty analysis, handling and reduction of data.

III. Prerequisite(s): ME 302

IV. Textbook(s) and/or Other Required Material: Lectures and writing resources provided online.

V. Course Objectives: Basic measurements used in the thermal sciences will be studied in this course. Thermal measurements under transient and steady-state conditions will be performed. Applications include conduction, convection, radiation, psychrometrics, fluid dynamics, and refrigeration experiments. Uncertainty analysis, data acquisition and processing will also be covered.

VI. Topics Covered:
- Making & Calibration of Thermocouples
- Thermal Conductivity
- Counter-Flow Heat Exchanger
- Transient Heat Conduction
- Radiation Heat Transfer
- Refrigeration
- Cooling Tower

VII. Class/laboratory Schedule, i.e., number of sessions each week and duration of each session: Meets at least twelve times during the semester for lectures lasting up to 1.5 hours and relevant to upcoming lab experiments. Lab sessions meet seven or more times during the course of the semester to conduct experiments.

VIII. Contribution of Homework, Quizzes, Tests, Laboratory Reports, or Research Papers: Lab reports 80%, lab final 20%

IX. Contribution of Course to Meeting the Professional Component: The course focuses on conducting experimental laboratories by starting the experiment, collecting necessary data, and shutting down the experiment. Also the course teaches correct analysis of the collected data and determination of the accuracy of results. Advanced software applications are learned during this
part of the course. The course also emphasizes technical writing and proper display of data/results in tables and graphs. Engineering Science: 1 credit (100%), Engineering Design 0 credits (0%)

Emergency Procedures. Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, available on BERT’s website at www.bert.siu.edu, Department of Safety’s website www.dps.siu.edu (disaster drop down) and in Emergency Response Guideline pamphlet. Know how to respond to each type of emergency. Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency. The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.