**Purpose**

Whether for a soldier on the battlefield, the victim of a building collapse, or an experiment on the International Space Station, the goal of the **Structural Acoustics Laboratory** is to develop new technologies in the areas of structural vibrations and acoustics. By gaining a fundamental understanding of the generation, transmission, and radiation mechanisms associated with sound and vibration, the needs of industry, government, and engineering education can be met in these areas.

**Goals**

- Meet needs of the U.S. military, industry, and other organizations by developing:
  - New noise & vibration control methods
  - Improved modeling and experimental techniques
- Strengthen relationships with industry and government in order to meet current and future needs in engineering workforce development

**Research Projects**

- Acoustic Sensor Development
- Mild Brain Injury Studies (*new*)
- Automotive NVH Modeling
- Dynamic Force Reconstruction Techniques
- Vibration Control of Space Station Rack Shelf
- Fuel Cell Dynamics and Acoustics
- Structural Damping Evaluation Methods
- Microgravity Vibration Isolation
- Gearbox Active Vibration Control

http://www.me.ua.edu/stal
**Capabilities and Instrumentation**

To serve the needs of externally supported research, engineering education, and contracted testing, the Structural Acoustics Lab has the following instrumentation and capabilities:

**Experiment and Measurement**

**Acoustics**

- **Hemi-Anechoic Chamber**: Detailed Acoustic Characterization
- **Acoustic Intensity** and Source Location
- **Source Directivity** and Other Acoustic Characterizations

**Vibrations**

- **Vibration Damping & Isolation** Characterization
- **Mode Shape** and Precise Node Location
- **Drive Point Impedance**
- **Low Frequency Measurements** (*DC Accelerometers*)
- **Spatial Vibration Measurements** via **Scanning Laser Vibrometer**

**Analysis and Computation**

- **Dynamic Simulation and Finite Element Modeling**
- **Acoustic Radiation** and **Structural Vibration Modeling**
- **Acoustic Modeling via Comet Acoustics**
- **Modeling of Structures containing Frequency-Dependent Viscoelastic Materials**
- **Gear Dynamic Modeling via Discrete/Lumped Dynamic Representations**
- **Damping Characterization for Beam- and Plate-Like Structures**

**Facilities**

- **Hemi-Anechoic Test Chamber**
  - 23′×19.5′×15′ with large access doors
  - 100 Hz ISO3745, NC-19
  - 80 Hz Free Field to 2 meters
  - Reconfigurable to Anechoic, Ventilated

- **Medium Component Sound Enclosure**

- **Small Component Test Lab**

- **Graduate Research Lab and Offices**

**Contact**

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