

CE 549: Structural Health Monitoring

Course Description:

Introductory and advanced topics in structural health monitoring (SHM) of aeronautical, civil, and mechanical systems. Topics include sensors, signal processing in time and frequency domains, data acquisition and transmission systems, design of integrated SHM solutions, nondestructive evaluation techniques, feature extraction methods, and cutting-edge research in the field of SHM. Graduate students will have a supervisory role to assist students in 449 and an additional design project or more in-depth analysis and design.

Course Design

The class is organized as a series of seminars that will sequentially cover the main topics of SHM. Seminars will feature experts from ISU and other institutions. Students will work in a team to design health monitoring solutions for a class project.

Course Outcomes (students should be able to):

- Students will be capable of designing health monitoring solutions

Course Topics

- Application-based SHM
- Sensors
- Filtering
- Time-Based Methods
- Feature Extraction
- Pattern Recognition
- Prognosis
- Data-to-Decision
- Multifunction Materials
- Sensing Skin