

# **System Dynamic Analysis - III**

## **Experimental Modal Analysis and System-Identification**

**Course Instructor: F. Necati Catbas, Ph.D.**

**Drexel Intelligent Infrastructure and Transportation Safety Institute (DI3)**

**Refs: Ewins, McConnell, Notes by Allemang and Brown, SDRC and HP Users Guides**

## **History of Experimental Modal Analysis**

### **Modal Data Acquisition**

- Digital Signal Processing
- Transducer Considerations
- Structural Testing Conditions

### **Frequency Response Function**

- FRF Estimation
- Signal Averaging
- Excitation
- Windowing Functions

### **Modal Parameter Estimation**

- Modal Identification Concepts
- Modal Identification Algorithms

### **Modal Data Presentation and Validation**

- Measurement Synthesis
- Visual Verification
- Finite Element Analysis

### **Application of Concepts – Group Projects**

- Finite Element Modeling
- Sensor Calibration
- Test Setup
- Data Acquisition and Signal Processing
- Modal Parameter Identification
- Evaluation of Experimental and Analytical Results

# MEM 800 - Section 566/567/568

## System Dynamic Analysis

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- Structural Dynamics/Vibrations Theory
- Single and Multi Degree of Freedom Systems
- Analytical/Experimental Relationships
- Data Acquisition, Digital Signal Processing Concepts
- Measurement, Structural Testing and Transducer Concepts
- Modal Parameter Estimation Techniques
- Modal Data Presentation/Validation Techniques
- Modeling Techniques, Model and Test Correlation, Model Updating

