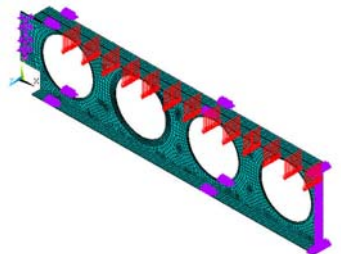
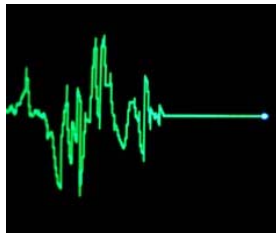
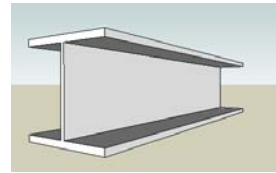


Experimental Evaluation of a SMARTBEAM

Structural Engineering and the Behavior of Steel Structures

- Did you ever wonder why the cross section of a steel beam has an I-shape?
- Did you ever wonder how structural engineers determine the size of beams and columns?
- What happens when a steel structure is loaded to failure? Does it collapse, does it stretch, does it disappear into thin air, or does it redistribute load?
- Why would engineers put holes in steel beams?
- Can engineers measure the “pulse” of the structures they build and know how healthy or sick they are?
- How accurately can engineers analytically predict the strength and stiffness of the structures they build?



Dr. Mercedes of the Electrical Engineering Department, Dr. Ural of the Mechanical Engineering Department and Dr. Yost of the Civil Engineering Department are concerned and feel these are all great questions that deserve an answer! And that is exactly what we plan to do if you select this project

Project Overview

This project involves the study of steel, and explores how engineers are able to predict the behavior of steel structures using basic principles of structural analysis, smart technology and electronic sensors, as well as advanced computer modeling techniques. This project includes substantial elements from civil engineering, electrical engineering, and mechanical engineering. The civil engineering components are related to material behavior, structural analysis/design and large scale experimental testing. The electrical engineering portion of the project includes the design and construction of a data acquisition system to measure stress in the steel beam. The mechanical engineering element part will focus on modeling the structural system using finite element analysis. Students will also have ample opportunity to explore and learn about the Structural Engineering Teaching and Research Facility (SETRL).



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