

## **ME DEPARTMENTAL SEMINAR**

**Friday, October 7, 2005**

**1:00pm – 2:00pm**

**2233 GG BROWN**

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Naval Architecture & Marine Engineering  
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***“Applications And Validation of Energy Based Methods  
In Structural Acoustics”***

**Abstract:**

The Energy Finite Element Analysis (EFEA) is a finite element approach for computing high frequency vibrations and for simulating the structural – acoustic behavior of large scale structures. The primary variables in the EFEA are space averaged over a wave length and time averaged over a period energy densities. The governing differential equations of the EFEA are derived from a wave based approach. In addition to the EFEA, an Energy Boundary Element Analysis (EBEA) method has been developed for high frequency exterior acoustic simulations, and a hybrid FEA method has been developed for coupling conventional finite elements with EFEA.

In this presentation the theoretical background of the EFEA will be discussed briefly. Several applications where experimental data have been compared to simulation results will be presented in order to demonstrate the capabilities and the value of the three aforementioned energy based methods.