

Department of Mechanical Engineering

THESIS DEFENSE

By

Sandeep Sarikonda

## **Nonlinear Dynamics and Control of Unmanned Sailboats:**

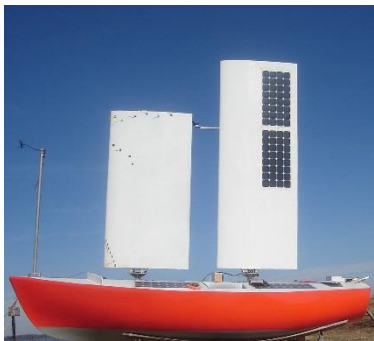
**Wednesday, August 26, 2015**

**9:30 a.m. - 11:30 a.m.**

**CEER 210**

THESIS ADVISOR: Dr. C. Nataraj

### **Abstract:**



In this thesis, a mathematical model is considered for the dynamics of a typical sailboat, and various sailing conditions are simulated and discussed with a focus on practical constraints such as pitching motion, rolling motion and vertical displacement. Taking the wind speed, the sail angle as well as the rudder angle as varying parameters, nonlinear dynamic analysis is carried out. It is shown that these phenomena strongly affect the sailing mechanism and performance. A feedback control algorithm is designed and integrated and the performance is investigated for both the linear and nonlinear models of the sailboat.