2008-2009

Graduate Seminar Series

The Department of Mechanical Engineering – Engineering Mechanics

Proudly Presents

Professor Bhavani V. Sankar

University of Florida

Bhavani V. Sankar received his BSME from Madurai University, MSME from the Indian Institute of Science at Bangalore and his doctoral degree in Aeronautics and Astronautics from Purdue University. He has been with the University of Florida since August 1986. Currently he is the Newton C. Ebaugh Professor in the Department of Mechanical & Aerospace Engineering. Recently he was awarded the University of Florida Research Foundation Professorship. Sankar's research interests are in mechanics of composite materials and structures, in particular, micromechanics and fracture mechanics and mechanics of MEMS devices, functionally graded materials and foams and thermal protection systems. Sankar has published more than 250 articles in archival journals and conference proceedings. He is a Fellow of ASME, Fellow of ASC and an Associate Fellow of AIAA. He has been an associate editor of AIAA Journal and has served on the editorial board of Journal of Composite Materials. Currently he is on the editorial board of Journal of Sandwich Structures & Materials and Computer Modeling in Engineering & Sciences.

Thursday, Sept. 25, 2008 3:00 – 4:00 p.m. Room 112, ME-EM Bldg.

Micromechanical Models for Predicting Failure and Fracture in Composite Materials

Traditionally homogenization has been used to predict the thermo-mechanical, thermal and other transport properties of composite materials and heterogeneous material systems. Recent advances in computational methods have enabled to simulate progressive failure including crack propagation. In this talk simulation of failure and fracture of various materials systems such as textile composite materials and cellular materials including functionally graded foams are presented. The challenges in predicting failure in the presence of large stress gradients in the microstructure will be discussed, and a method in which currently available phenomenological criteria could be modified to accommodate stress gradient effects will be presented. Effects of thermal stresses on the failure of fiber composites will be discussed and an efficient method of modifying the phenomenological failure criteria will be presented. Calculation of thermal stresses in Integrated Thermal Protection Systems will be used as an example to demonstrate stress gradient effects.

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