



2007 - 2008



**MATHEMATICS COLLOQUIUM SERIES
UNIVERSITY OF CENTRAL FLORIDA**

**Dr. Xiaoming Zheng
Department of Mathematics
University of Michigan**

will speak on

Numerical Simulations of Tumor Growth, Angiogenesis and Chemotherapy

ABSTRACT: Mathematical modeling and computer simulations play increasingly important roles in the cancer research, and the most important one is providing a framework to capture various mechanisms underlying tumor growth and angiogenesis (new blood vessels formation). A tumor develops through avascular, angiogenesis and vascularized stages to be malignant. Initially a tumor utilizes nutrient diffusing from parent vessels to grow but only up to a limited size (~2mm in diameter). The key to reach malignant stage is the angiogenesis process, where tumor obtains extra source of nutrient and begin to grow out of control. In this talk, I will first present a mathematical model serving as framework for cancer research to simulate the growth of a tumor through all these stages, then describe a chemotherapy model to predict drug efficacy in the condition of vascular and morphological heterogeneity. Finally I will present a new angiogenesis model that addresses the proper relationship between endothelial cells (lining up the blood vessels) proliferation and migration, which is the key to understand vasculogenesis (formation of blood vessel plexus in embryo) and angiogenesis processes.

DATE: Tuesday, January 29, 2008

TIME: 10:30 – 11:30am

PLACE: MAP 318

Refreshments will be served