Announcing the Final Examination of Abhijeet Bhalkikar for the degree of Master of Science

Time & Location: April 15, 2010 at 10:30 AM in Research Pavilion 402
Title: Study of the interactions of proteins, cells and tissue with biomaterials

Bioengineering is the application of engineering principles to address challenges in the fields of biology and medicine. Biomaterials play a major role in bioengineering. This work employs a three level approach to study the various interactions of biomaterials with proteins, cells and tissue in-vitro. In the first study, we qualitatively and quantitatively analyzed the process of protein adsorption of two enzymes to two different surface chemistries, which are commonly used in the field. In the second study, we attempted to engineer a tissue construct to build a biocompatible interface between a titanium substrate and human skin. In the third study, an in-vitro model of the motoneuron-muscle part of the stretch reflex arc circuit was developed. Using a novel silicon based micro-cantilever device, muscle contraction dynamics were measured and have shown the presence of a functional neuro-muscular junction (NMJ). These studies have potential applications in the rational design of biomaterials used for biosensors and other implantable devices, in the development of a functional prosthesis and as a high-throughput drug-screening platform to study various neuro-muscular disorders.

Major: Electrical Engineering

Educational Career:
Bachelor’s of Industrial Electronics Engineering, BS, 2002, University of Pune, India

Committee in Charge:
Dr James Hickman, Chair, Electrical Engineering and Computer Science
Dr Aman Behal, Electrical Engineering and Computer Science
Dr Hyoung Jin Cho, Electrical Engineering and Computer Science

Approved for distribution by Dr James Hickman, Committee Chair, on March 30, 2010.

The public is welcome to attend.