BME 4460/6460 – Nanomedicine Fundamentals

Course Description
Overview of the distinctive features of nanotechnology and their application to biomedical problems. Contrasts macro/micro/nano to bring out the unique properties of nanotechnology in nanomedicine. Cutting-edge nanomedical technologies for sensing and imaging, drug delivery, and therapeutic applications will be addressed.

Undergraduate/Graduate level – 3 credit hours.

*Homework and exams are specific for the graduate students. In them concepts are explored at a deeper level than for undergraduates.

Course Learning Objectives
Students enrolled in this course will learn the distinctive features of nanotechnology and their application to biomedical problems, such as sensing and imaging, drug delivery, and therapeutic applications, as well as the contrast between macro/micro/nano to understand the unique properties in nanomedicine.

Course Learning Outcomes
Students enrolled in this course can tell the distinctive features of nanotechnology and their application to biomedical problems, such as sensing and imaging, drug delivery, and therapeutic applications, as well as the contrast between macro/micro/nano to understand the unique properties in nanomedicine.

Tentative Weekly Schedule

Week 1	Need for new perspectives on medicine; Basic concepts of nanomedicine
Week 2	Nanomedical systems
Week 3	Synthesis of Nanoparticles and Design Consideration for Application in Nanomedicine
Week 4	Targeting nanomedical systems to cells & assessing specificity
Week 5	Nanomedicine in Cardiovascular Diseases
Week 6	Nanomedicine in Lung diseases
Week 7	Nanomedicine in Brain and nervous system
Week 8	Nanomedicine in cancer
Week 9	Review; Mid-Term Exam
Week 10	Toxicity
Week 11	Lab
Week 12	Lab
Week 13	Lab
Week 14	Review
Week 15	Final exam