1. Course number and name: BMED 3520 Biomedical Systems and Modeling
2. Credits and contact hours: (1-4-0-3)
3. Prepared by: Paul Benkeser
4. Textbook: Physiological Control Systems: Analysis, Simulation, and Estimation, Khoo, Wiley IEEE Press (2000).
5. Specific course information
   a. Catalog description: Basic concepts, modeling tools and analysis techniques for the study of biochemical, bioelectrical and biomedical systems.
   b. Prerequisites or co-requisites: BMED 2110, BMED 3100, MATH 2552, and CS 1371
   c. Required
6. Specific goals for the course
   a. Understand the fundamentals of quantitative physiological modeling (Student Outcome 1)
      i. Understand the basic strengths and limitations of quantitative modeling
      ii. Understand steady-state and dynamical analysis techniques
      iii. Know the relationships between time, Laplace, and frequency domains
   b. Identify, formulate and solve quantitative models of physiological systems using analytical tools in the time, Laplace, and frequency domains (Student Outcome 1)
      i. Understand how to solve biomedical engineering problems using quantitative modeling tools from the time domain
      ii. Understand how to solve biomedical engineering problems using quantitative modeling tools from the Laplace domain
      iii. Understand how to solve biomedical engineering problems using quantitative modeling tools from the frequency domain
7. Brief list of topics to be covered:
   a. Systems and modeling
   b. Linear systems analysis in the time domain
   c. Linear systems analysis in the Laplace domain
   d. Linear systems analysis in the frequency domain
   e. Control systems design and analysis