1. Course number and name: BMED 3100 Systems Physiology
2. Credits and contact hours: (3-0-0-3)
3. Prepared by: Michelle LaPlaca
4. Textbook: Human Physiology: An Integrated Approach, 6th edition, Silverthorn, Prentice-Hall (2013)
5. Specific course information
    a. Catalog description: An introduction to human physiology emphasizing biomedical engineerwing approaches to the understanding of basic organ function, disease states, and medical intervention
    b. Prerequisites or co-requisites: CHEM 1315 or CHEM 2311 or Junior Standing
    c. Required
6. Specific goals for the course
    a. Understand basic terminology, structures, and processes in human physiology (Student Outcomes 1 and 3)
        i. State the anatomical structures and physiological functions of major organ systems
        ii. Understand homeostatic processes and integration of human organ systems
        iii. Explain medical terminology as it relates to physiology, pathophysiology, and biomedical engineering
    b. Apply quantitative approaches for the analysis of physiological systems (Student Outcomes 1 and 7)
        i. Apply quantitative skills for analyzing physiological processes in both normal and disturbed states
        ii. Simplify and model physiologic processes
    c. Identify, analyze and interpret data from physiological systems (Student Outcomes 1 and 6)
        i. Consider patient variability and its impact on biomedical engineering challenges
        ii. Analyze and interpret data from medical case studies
    d. Tackle complex real world human physiological problems (Student Outcomes 1, 3, 4 and 6)
        i. Understand the challenges associated with interaction between non-living materials and living systems
        ii. Read and critique the scientific/medical literature
        iii. Identify and discuss ethical issues associated with medical intervention and modern engineering tools and applications
7. Brief list of topics to be covered:
    a. Tissues of the body
    b. Homeostasis

c. Physiological control systems
d. Introduction to pathophysiology
e. Cell membranes and transports, diffusion, osmosis, and tonicity
f. Multiple physiological systems
g. Selected topics and case studies in integrative physiology, pathophysiology, and biomedical engineering applications