TRMD 6010 Biological Basis of Diseases

Professor: Mark Wiser, PhD

Credits: 3

Semester(s) offered: Fall, Spring, Summer

Course Description:

This course provides a foundation of knowledge about the human body in health and disease. It gives an overview of important concepts of the biological mechanisms of disease at the cellular, individual, and societal levels. At the cellular level, the course summarizes DNA and cellular function, genomics, immunology, and vaccination. At the individual and societal levels, the course addresses the most important infectious and noninfectious causes of death worldwide, providing background on their pathophysiology, clinical aspects, patterns of disease occurrence, risk factors, and methods of prevention.
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Learning Objectives:

At the completion of this course, the student will be able to:

Molecular and Cellular Level
1. Describe the central dogma of biology, including definitions of DNA, RNA, protein, macromolecule function and classify organ systems.
2. Outline genome structure and organization and discuss cell cycle control and cancer.
3. Discuss major metabolic pathways, signaling and homeostasis.
4. Discuss inheritance and evolution, and explain and quantify genetic diversity.

Physiological and Organ System Level
1. Describe major physiological and organ systems, including immune and endocrine systems.
2. Identify and describe the basic/major diseases of the organ systems.
3. Describe the role of diet and the aging process as they relate to health and disease states.
4. Discuss the effects of environmental factors on metabolism and organ systems.
5. Discuss the effects of behavior on metabolism and organ systems.
6. Describe the effects of infectious diseases on metabolism and organ systems.

Society Level
1. Describe the most prevalent global diseases (e.g. cardiovascular) in terms of:
   a. patterns
   b. etiology
   c. risk factors
   d. clinical aspects
   e. major issues in prevention and control
2. Discuss population dynamics (reproduction, fecundity, selection, allele frequencies, fitness, and evolution).