

**WESTERN CONNECTICUT STATE UNIVERSITY**  
**Department of Nursing**

**Course Number:** NUR 515

**Course Title:** Advanced Pathophysiology

**Credits:** 3 S.H.

**Placement:** Role Development

**Pre-requisites:** None

**Course Description:**

Advanced study of human physiology and pathophysiology with application to nursing interventions and evaluation of outcomes. This course builds upon a strong foundation in anatomy and physiology, emphasizing alterations in cellular structure and function, alterations in biochemical processes, and the integration of body systems.

**Student Learning Outcomes:**

1. Analyze the effects of abnormal function of various body systems.
2. Describe how dysfunction of one body system affects the function of other body systems.
3. Apply principles of pathophysiology in the identification of existing and potential problems using case materials and clinical examples.
4. Evaluate the outcomes of selected therapeutic interventions on the basis of alterations in biophysical functions.
5. Demonstrates an understanding of the relationship of genetics and genomics to health, prevention, screening, diagnostics, and prognostics, selection of treatment and monitoring of treatment effectiveness.

**Content Outline:**

- I. Functional Organization of the Human Body and Control of Internal Environment
  - A. Human cellular structure and function
  - B. Homeostasis and adaptation
  - C. Nature and scope of disease

- II. Inflammation, Immunity, and Blood Clotting
  - A. Inflammation and immuno-competence
  - B. Immunodeficiency
  - C. Hypersensitivity and autoallergic reactions
  - D. Integration of the kinin, complement, and clotting systems
  - E. Selected inflammatory and clotting pathologies
  - F. Multisystem effects of immunologic, inflammatory, and clotting dysfunction
  
- III. Endocrine Mechanisms
  - A. Regulatory mechanisms of hormones
  - B. Hypothalamic control of pituitary function
  - C. Pituitary-adrenal axis: regulation and pathophysiology
  - D. Clinical evaluation of derangements in thyroid and parathyroid functioning
  - E. Clinical evaluation of altered states in diabetes mellitus
  
- IV. Nervous System and Processing of Signals
  - A. Transmission of information in the nervous system
  - B. Second messenger systems
  - C. Pathophysiologic disorders of the brain and spinal cord
  - D. Neuromuscular dysfunction
  - E. Neuroendocrine response to stress
  - F. Neuroendocrine effects on immunity and inflammation
  
- V. Integrated Cardiovascular, Pulmonary, and Renal Mechanisms
  - A. Cardiovascular fluid dynamics
  - B. Cardiovascular adaptation to altered functioning
  - C. Oxygen transport and blood gas exchange
  - D. Ventilation and perfusion imbalance
  - E. Maintenance of fluid and electrolytes
  - F. Clinical evaluation of acid-base disturbances
  - G. Selected pulmonary dysfunctions
  - H. Cardiac failure, hypertension, and shock
  - I. Renal failure and other selected pathologies
  
- VI. Patterns of disease associated with single gene and multifactorial inheritance and relationships of genetics and genomics to normal physiology and pathophysiology including:
  - A. Basics of gene function and genetic mutations in individuals and populations
  - B. Germline mutations, somatic mutations, polymorphism
  - C. Selected mutations associated with single gene disorders and chronic diseases
  - D. Concept of genotype/phenotype

E. Selected genotype predictors for disease prognoses and treatment.

**Approved:**

Graduate Council 2006

**Revision Spring 2013**

Programs Committee Feb 2013

Department of Nursing Feb 2013

AVP April 2013