

## **COURSE OUTLINE**

### **Pathophysiology**

#### **Course Description**

NR 230. Pathophysiology. 4 hours credit. Prerequisite: BI 240 with a C or better. This course will enable the student to develop an understanding of the concepts of pathophysiology including inflammation and healing, immune responses, fluid/electrolyte imbalances, pain, neoplasms and genetics. The student will apply these underlying concepts to explore the pathophysiology, etiology, clinical manifestations and treatments of common disorders in major body systems.

#### **Course Relevance**

The concepts learned in this course will allow the student to understand the relationship between pathophysiology, clinical manifestations, diagnostic tests and medical treatment in altered health states. This information can be used by the student in his/her health care related practice.

#### **Required Materials**

Huether, S. E. and McCance, K. L., *Understanding pathophysiology*. St. Louis, MO: Mosby.

#### **Online Materials**

Huether, S. E. and McCance, K. L., *Understanding pathophysiology*. St. Louis, MO: Mosby.

#### **Supplemental**

Huether, S.E. and McCance, K.L. *Study Guide and Workbook for Understanding pathophysiology*. St. Louis, MO: Mosby.

\* - For complete textbook information, refer to <http://www.butlercc.bkstr.com>

#### **Learning Outcomes**

The intention is for the student to be able to:

1. Apply the concepts of inflammation and healing, immune responses, fluid/electrolyte imbalances, pain, neoplasms and genetics to common disorders in major body systems.
2. Discuss the pathophysiology, etiology, clinical manifestations and treatments of common disorders in the major body systems.
3. Apply pathophysiology content to his/her health related practice.

#### **Learning PACT Skills that will be DEVELOPED and/or documented in this course**

Through involvement in this course, the student will develop ability in the following PACT skill area(s):

##### **Analytical Thinking Skills**

1. Critical thinking

Through the analysis of case studies, the student will develop critical thinking skills.

### **Major Summative Assessment Task(s)**

These learning outcome(s) and the Learning PACT skill(s) will be demonstrated by

1. Analyzing a progressive case study involving a common disorder of a major body system.
2. Presenting a teaching project involving one common disorder of a major body system.

### **Course Content**

- I. Skills/Competencies – Actions that are essential to achieve the course outcomes:
  - A. Assessment
  - B. Solve problems/make decisions
  - C. Communicate
  - D. Collaborate
- II. Themes – Key recurring concepts that run throughout this course:
  - A. Etiology of disease
  - B. Pathophysiology
  - C. Clinical manifestations
  - D. Diagnostic testing
  - E. Medical treatments
- III. Issues – Key areas of conflict that must be understood in order to achieve the intended outcome:
  - A. Evidenced based practice versus practice based on tradition
  - B. Professional and authentic resources versus opinion resources
- IV. Concepts – Key concepts that must be understood to address the issues:
  - A. Inflammation/wound healing
  - B. Immunity
  - C. Infection
  - D. Genetics
  - E. Neoplasms
  - F. Growth and development
  - G. Pain
  - H. Fluid and electrolytes

### **Learning Units**

- I. Inflammatory response
  - A. Vascular response to injury
  - B. Cellular and chemical response to injury
  - C. Acute and chronic inflammation
  - D. Manifestations of inflammation
- II. Tissue repair and wound healing
  - A. Tissue repair
  - B. Factors influencing wound healing
- III. Immune System

- A. Normal immune response
- B. Four types of hypersensitivity
- C. Causes, types and effects of immunodeficiency
- D. Autoimmunity

#### IV. Neoplasms

- A. Benign and malignant neoplasms
- B. Incidence and risk factors of cancers
- C. Characteristics of normal and malignant cells
- D. Effects of cancer on the body
- E. Role of chemotherapy, radiation therapy, nutrition and other drugs in the treatment of cancer

#### V. Fluid, electrolyte and acid base imbalances

- A. Fluid compartment relationships
- B. Fluid volume excess and fluid volume deficit
- C. Sodium, potassium and calcium imbalances
- D. Acid – base imbalances

#### VI. Genetic and congenital disorders

- A. Patterns of recessive and dominant mendelian inheritance
- B. Congenital defects and genetic disorders
- C. Single gene inheritance, chromosomal disorders and multifactorial inheritance

#### VII. Pain

- A. List the causes of pain
- B. Describe the pain pathways and theories of pain
- C. Identify the characteristics of pain
- D. Discuss treatments recommended for pain management

#### VIII. Alterations in hematologic function

- A. Red blood cell disorders
  - 1. Pathophysiology
  - 2. Etiology
  - 3. Clinical manifestations
  - 4. Diagnostic and laboratory procedures
  - 5. Current treatments and therapies
- B. White blood cell disorders
  - 1. Pathophysiology
  - 2. Etiology
  - 3. Clinical manifestations
  - 4. Diagnostic and laboratory procedures
  - 5. Current treatments and therapies
- C. Lymphoid tissue disorders
  - 1. Pathophysiology
  - 2. Etiology
  - 3. Clinical manifestations
  - 4. Diagnostic and laboratory procedures
  - 5. Current treatments and therapies

- D. Coagulation and bleeding disorders
  - 1. Pathophysiology

2. Etiology
3. Clinical manifestations
4. Diagnostic and laboratory procedures
5. Current treatments and therapies

IX. Alterations in cardiovascular function

- A. Peripheral arterial and venous disorders
  1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- B. Alterations in blood pressure
  1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- C. Coronary vascular disorders
  1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- D. Structural, infectious or inflammatory cardiac disorders
  1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- E. Heart failure and shock
  1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies

X. Alterations in respiratory function

- A. Infectious disorders and neoplasms
  1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- B. Obstructive lung disorders
  1. Pathophysiology

2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- C. Pulmonary vascular disorders
1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- D. Pleural disorders
1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- E. Chest trauma
1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies

XI. Alterations in digestive function

- A. Oral and esophageal disorders
1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- B. Gastric disorders
1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- C. Small and large Intestinal disorders
1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- D. Hepatic and biliary disorders
1. Pathophysiology
  2. Etiology
  3. Clinical manifestations

4. Diagnostic and laboratory procedures
5. Current treatments and therapies

XII. Alterations in renal and urinary tract function

- A. Urinary infection and obstruction disorders
  1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- B. Glomerular disorders
  1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- C. Renal failure
  1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies

XIII. Alterations in neurological function

- A. Alterations in cerebral homeostasis – increased intracranial pressure
- B. Spinal cord injury
  1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- C. Central nervous system disorders
  1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- D. Degenerative and peripheral nervous system disorders
  1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies

XIV. Alterations in endocrine function

- A. Thyroid and parathyroid disorders
  1. Pathophysiology

2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- B. Diabetes mellitus
1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- C. Disorders of adrenal cortex
1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures

XV. Alterations in musculoskeletal function

- A. Musculoskeletal injury and trauma
1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- B. Metabolic disorders
1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- C. Degenerative disorders
1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
- D. Autoimmune and inflammatory disorders
1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures
  5. Current treatments and therapies
- F. Infectious and neoplasm disorders
1. Pathophysiology
  2. Etiology
  3. Clinical manifestations
  4. Diagnostic and laboratory procedures

5. Current treatments and therapies

XVI. Alterations in integumentary

- A. Skin disorders
  - 1. Pathophysiology
  - 2. Etiology
  - 3. Clinical manifestations
  - 4. Diagnostic and laboratory procedures
  - 5. Current treatments and therapies
- B. Skin cancers
  - 1. Pathophysiology
  - 2. Etiology
  - 3. Clinical manifestations
  - 4. Diagnostic and laboratory procedures
  - 5. Current treatments and therapies

XVII. Alterations in reproductive function

- A. Male reproductive organ disorders
  - 1. Pathophysiology
  - 2. Etiology
  - 3. Clinical manifestations
  - 4. Diagnostic and laboratory procedures
  - 5. Current treatments and therapies
- B. Female reproductive organ disorders
  - 1. Pathophysiology
  - 2. Etiology
  - 3. Clinical manifestations
  - 4. Diagnostic and laboratory procedures
  - 5. Current treatments and therapies
- C. Breast disorders
  - 1. Pathophysiology
  - 2. Etiology
  - 3. Clinical manifestations
  - 4. Diagnostic and laboratory procedures

**Learning Activities**

Independent and collaborative learning activities will be assigned to assist the student to achieve the intended learning outcomes. Class discussion, lecture, group activities, reading assignments, and classroom and Internet activities will also contribute to the learning process.

**Grade Determination**

Grade determination will be based upon class participation, assignments, exams and the assessment tasks.