Course Description
BI 231. Pathophysiology. 4 hours credit. Prerequisite: BI 240 or both BI 226 and BI 227, all with a C or better. This course will enable the student to explore 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.

Required Materials
For complete material(s) information, refer to https://bookstore.butlercc.edu

Butler-assessed Outcomes
The intention is for the student to be able to
1. Apply 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 health-related practices.

Learning PACT Skills that will be developed and documented in this course
Through involvement in this course, the student will develop ability in the following PACT skill area(s):
Analytical Thinking Skills
- Critical thinking - Through the analysis of case studies, the student will develop critical thinking skills related to the impact of pathophysiology on illness.

Communication Skills
- Reception and Interpretation of messages - Through the presentation of a teaching project, the student will communicate pathophysiology knowledge to peers.

Major Summative Assessment Task(s)
These Butler-assessed Outcomes and Learning PACT skills 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.
Skills or Competencies
These actions are essential to achieve the course outcomes:
1. Assess the etiology and pathophysiology of disease.
2. Troubleshoot problems and make decisions using diagnostic test information and clinical manifestations.
3. Communicate the etiology, pathophysiology, clinical manifestations, diagnostic testing, and medical treatments of a common disorder of a major body system by presenting a student teaching assignment.
4. Discuss common etiology, pathophysiology, clinical manifestations, diagnostic testing, and medical treatments.
5. Identify and explain the differences between evidence-based practice and tradition or opinion using current and reputable professional literature.

Learning Units
I. Inflammatory response
   A. Major steps in the inflammatory process
   B. Vascular response to injury
   C. Cellular and chemical response to injury
   D. Acute and chronic inflammation
   E. Manifestations of inflammation

II. Tissue repair and wound healing
   A. Resolution and repair
   B. Primary and secondary intention
   C. Factors influencing wound healing

III. Immune System
   A. Normal immune response
   B. Three Cascade pathways
   C. Lines of immune defense
   D. Four types of hypersensitivity
   E. Immunodeficiency and abnormal immune response
   F. Major cells, cytokines, and proteins
   G. 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. Cancer treatment modalities
   F. Neoplasm naming

V. Fluid, electrolyte and acid base imbalances
   A. Relevant vocabulary and acronyms
   B. Fluid compartment relationships
C. Fluid volume excess and fluid volume deficit
D. Sodium, potassium and calcium imbalances
E. Acid – base imbalances

VI. Genetic and congenital disorders
   A. Relevant vocabulary and acronyms
   B. Patterns of recessive and dominant Mendelian inheritance
   C. Congenital defects and genetic disorders
   D. Single gene inheritance, chromosomal disorders, and multifactorial inheritance

VII. Pain
   A. Causes
   B. Pathways and theories
   C. Characteristics
   D. Recommended management treatments

VIII. Alterations in hematologic function
   A. Red blood cell disorders
      1. Pathophysiology
      2. Etiology
      3. Clinical manifestations
      4. Diagnostic and laboratory tests
      5. Current treatments and therapies
   B. White blood cell disorders
      1. Pathophysiology
      2. Etiology
      3. Clinical manifestations
      4. Diagnostic and laboratory tests
      5. Current treatments and therapies
   C. Lymphoid tissue disorders
      1. Pathophysiology
      2. Etiology
      3. Clinical manifestations
      4. Diagnostic and laboratory tests
      5. Current treatments and therapies
   D. Coagulation and bleeding disorders
      1. Normal blood coagulation pathway
      2. Pathophysiology
      3. Etiology
      4. Clinical manifestations
      5. Diagnostic and laboratory tests
      6. 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 tests
5. Current treatments and therapies

B. Alterations in blood pressure
1. Pathophysiology
2. Etiology
3. Clinical manifestations
4. Diagnostic and laboratory tests
5. Current treatments and therapies

C. Coronary vascular disorders
1. Pathophysiology
2. Etiology
3. Clinical manifestations
4. Diagnostic and laboratory tests
5. Current treatments and therapies

D. Structural, infectious or inflammatory cardiac disorders
1. Pathophysiology
2. Etiology
3. Clinical manifestations
4. Diagnostic and laboratory tests
5. Current treatments and therapies

E. Heart failure and shock
1. Pathophysiology
2. Etiology
3. Clinical manifestations
4. Diagnostic and laboratory tests
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 tests
5. Current treatments and therapies

B. Obstructive lung disorders
1. Pathophysiology
2. Etiology
3. Clinical manifestations
4. Diagnostic and laboratory tests
5. Current treatments and therapies

C. Pulmonary vascular disorders
1. Pathophysiology
2. Etiology
3. Clinical manifestations
4. Diagnostic and laboratory tests
5. Current treatments and therapies

D. Pleural disorders
   1. Pathophysiology
   2. Etiology
   3. Clinical manifestations
   4. Diagnostic and laboratory tests
   5. Current treatments and therapies

E. Chest trauma
   1. Pathophysiology
   2. Etiology
   3. Clinical manifestations
   4. Diagnostic and laboratory tests
   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 tests
   5. Current treatments and therapies

B. Gastric disorders
   1. Pathophysiology
   2. Etiology
   3. Clinical manifestations
   4. Diagnostic and laboratory tests
   5. Current treatments and therapies

C. Small and large intestinal disorders
   1. Pathophysiology
   2. Etiology
   3. Clinical manifestations
   4. Diagnostic and laboratory tests
   5. Current treatments and therapies

D. Hepatic and biliary disorders
   1. Pathophysiology
   2. Etiology
   3. Clinical manifestations
   4. Diagnostic and laboratory tests
   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 tests
5. Current treatments and therapies

B. Glomerular disorders
   1. Pathophysiology
   2. Etiology
   3. Clinical manifestations
   4. Diagnostic and laboratory tests
   5. Current treatments and therapies

C. Renal failure
   1. Pathophysiology
   2. Etiology
   3. Clinical manifestations
   4. Diagnostic and laboratory tests
   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 tests
      5. Current treatments and therapies
   C. Central nervous system disorders
      1. Pathophysiology
      2. Etiology
      3. Clinical manifestations
      4. Diagnostic and laboratory tests
      5. Current treatments and therapies
   D. Degenerative and peripheral nervous system disorders
      1. Pathophysiology
      2. Etiology
      3. Clinical manifestations
      4. Diagnostic and laboratory tests
      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 tests
      5. Current treatments and therapies
   B. Diabetes mellitus
      1. Pathophysiology
      2. Etiology
3. Clinical manifestations
4. Diagnostic and laboratory tests
5. Current treatments and therapies

C. Disorders of adrenal cortical
   1. Pathophysiology
   2. Etiology
   3. Clinical manifestations
   4. Diagnostic and laboratory tests

XV. Alterations in musculoskeletal function
A. Musculoskeletal injury and trauma
   1. Pathophysiology
   2. Etiology
   3. Clinical manifestations
   4. Diagnostic and laboratory tests
   5. Current treatments and therapies

B. Metabolic disorders
   1. Pathophysiology
   2. Etiology
   3. Clinical manifestations
   4. Diagnostic and laboratory tests
   5. Current treatments and therapies

C. Degenerative disorders
   1. Pathophysiology
   2. Etiology
   3. Clinical manifestations
   4. Diagnostic and laboratory tests

D. Autoimmune and inflammatory disorders
   1. Pathophysiology
   2. Etiology
   3. Clinical manifestations
   4. Diagnostic and laboratory tests
   5. Current treatments and therapies

E. Infectious and neoplasm disorders
   1. Pathophysiology
   2. Etiology
   3. Clinical manifestations
   4. Diagnostic and laboratory tests
   5. Current treatments and therapies

XVI. Alterations in integumentary
A. Skin disorders
   1. Pathophysiology
   2. Etiology
   3. Clinical manifestations
   4. Diagnostic and laboratory tests
5. Current treatments and therapies

B. Skin cancers
   1. Pathophysiology
   2. Etiology
   3. Clinical manifestations
   4. Diagnostic and laboratory tests

XVII. Alterations in reproductive function
   A. Male reproductive organ disorders
      1. Pathophysiology
      2. Etiology
      3. Clinical manifestations
      4. Diagnostic and laboratory tests
      5. Current treatments and therapies
   B. Female reproductive organ disorders
      1. Pathophysiology
      2. Etiology
      3. Clinical manifestations
      4. Diagnostic and laboratory tests
      5. Current treatments and therapies
   C. Breast disorders
      1. Pathophysiology
      2. Etiology
      3. Clinical manifestations
      4. Diagnostic and laboratory tests

Learning Activities
Independent and collaborative learning activities will be assigned to assist the student in achieving the intended learning outcomes. Class discussion, lecture, group activities, reading assignments, classroom activities, and internet activities may all be used to support the learning process. These activities may be either face-to-face or online.

Grade Determination
Grade determination will be based on class participation, assignments, exams / assessments, and other tasks assigned by the instructor. The student must earn 75% or C to be successful in this course.