Course Title: Human Pathophysiology

Course No.: BIO 2800

No. of Credit Hours: 3

Prerequisites: BIO-1040 or BIO-2070/2070L and BIO-2080/2080L; or permission of division chair

Course Description:
Students learn the physiology of various human diseases and disorders. Topics include diseases and disorders of the immune, nervous, endocrine, reproductive, hemalogic, cardiovascular, lymphatic, pulmonary, urologic, digestive, musculoskeletal, and integumentary systems. Also discussed are various cancers.

Core Learning Areas

The Core Learning Areas represent a common body of skills and knowledge to which all graduates with associate’s degrees should be exposed and for which the college may determine certain levels of competency which will be assessed through the general education curriculum.

The following Core Learning Areas will be emphasized and assessed in BIO 2800.

Critical Thinking

Critical thinking is an intentional, reflective process used to make judgments and decisions through reasoning, analysis, evaluation, interpretation, and inference.

Competency in this area is measured by the ability to:

30. Defend a reasonable position

Information Literacy

Information literacy is the ability to recognize a need for information and to use an efficient process to obtain reliable information that meets the need.
Competency in this area is measured by the ability to:

41. Retrieve information legally, responsibly, and ethically

All of these core learning areas will be assessed using journal entries and discussions, graded using a rubric that can be found in the syllabus.

Performance Objectives:
Students successfully completing the course are expected to have a detailed understanding of the following topics:

1) Describe the basic concepts associated with disease processes.
2) Describe the inflammation and healing process.
3) Describe normal and abnormal immune responses.
4) Describe the principles of transmission and development of infections.
5) Describe and give examples of benign and malignant tumors. Describe various treatments of these benign and malignant tumors.
6) Describe various musculoskeletal disorders along with their causes and treatments.
7) Describe various respiratory disorders along with their causes and treatments.
8) Describe various digestive disorders along with their causes and treatments.
9) Describe various blood disorders along with their causes and treatments.
10) Describe various lymphatic disorders along with their causes and treatments.
11) Describe various cardiovascular disorders along with their causes and treatments.
12) Describe various urinary disorders along with their causes and treatments.

Outline of topics:

- **Basic Concepts of Disease Process**
  - Introduction to Pathophysiology
  - Health and Disease
  - Terms Used in Pathophysiology
  - Cellular Adaptations
  - Cell Damage and Necrosis
  - The Study of Pathophysiology

- **Inflammation & Healing**
  - Review of Normal Defenses in the Body
  - Review of Normal Capillary Exchange
  - Inflammation
    - Definition
    - Causes
    - Acute Inflammation
      - Local Effects
      - Systemic Effects
    - Diagnostic Tests
    - Course of the Inflammatory Response
• Potential Complications
  Chronic Inflammation
    Pathophysiology
    Treatment of Inflammation
    Drugs
    Other Therapies
  Healing
    Types of Healing
    The Healing Process
    Factors Affecting Healing
    Complications of healing by Scar Formation
  Example of Inflammation and Healing
  Burns

• Immunity & Abnormal Responses
  Review of the Immune System
    Purpose of the Immune System
    The Immune Response
    Components of the Immune System
    Diagnostic Tests
    The Process of Acquiring Immunity
  Tissue and Organ Transplant Rejection
  Hypersensitivity Reaction
    Type I Hypersensitivity – Allergy
    Type II – Cytotoxic Hypersensitivity
    Type III – Immune Complex Hypersensitivity
    Type IV – Cell-Mediated or Delayed Hypersensitivity
  Autoimmune Disorders
    Mechanism
    Example: Systemic Lupus Erythematosus Syndrome (AIDS)

• Infection
  Review of Microbiology
  Microorganisms
Types of Microorganisms
Other Parasites – Helminths
Resident Flora (indigenous or Normal Flora)
Principles of Infection
  Transmission of Infectious Agents
  Host Resistance
  Virulence and Pathogenicity of Microorganisms
Control of Transmission and Infection
Development of Infection
  Onset and Course
  Clinical Signs and Symptoms of Infection
  Diagnostic Tests
  Antimicrobial Drugs
Example of Infection: Influenza (Flu)

- **Neoplasms**
  Review of Normal Cells
  Benign and Malignant Tumors
    Nomenclature
    Characteristics of Benign and Malignant Tumors
  Malignant Tumors – Cancer
    Pathophysiology
    Etiology
    Treatment
    Prognosis
  Examples of Malignant Tumors
    Skin Cancer
    Ovarian Cancer
    Brain Tumors

- **Musculoskeletal Disorders**
  Review of the Musculoskeletal System
    Bone
    Skeletal Muscle
    Joints
    Diagnostic Test
Trauma
  Fractures
  Dislocations
  Sprains and Strains
  Other Injuries
Bone
  Osteoporosis
  Rickets and Osteomalacia
  Paget’s disease (Osteitis Deformans)
Bone Tumors
Disorder of Muscle, Tendons, and Ligaments
  Muscular Dystrophy
  Primary Fibromyalgia Syndrome
Joint Disorders
  Osteoarthritis
  Rheumatoid Arthritis
  Juvenile Rheumatoid Arthritis
Infectious (Septic) Arthritis
  Gout (Gouty Arthritis)
  Ankylosing Spondylitis

- **Respiratory Disorder**
  Review of Normal Structures in the Respiratory System
  Purpose and General Organization
  Structures in the Respiratory System
  Ventilation
  Gas Exchange
  Diagnostic Tests
General Manifestations of Respiratory Disease
Infectious Diseases
  Upper Respiratory Tract Infections
  Lower Respiratory Tract Infections
Obstructive Lung Diseases
  Cystic Fibrosis
  Lung Cancer
Aspiration
Asthma
Chronic Obstructive Pulmonary Disease
Emphysema
Chronic Bronchitis
Bronchiectasis
Restrictive Lung Disorders
Pneumoconioses
Vascular Disorders
Pulmonary Edema
Pulmonary Embolus
Expansion Disorder
Atelectasis
Pleural Effusion
Pneumothorax
Flail Chest
Infant Respiratory Distress Syndrome
Adult Respiratory Distress Syndrome
Acute Respiratory Failure

**Digestive System Disorder**
Review of the Digestive System
Structures and Their Functions
Neural and Hormonal Controls
Digestion and Absorption
Common Manifestations of Digestive System Disorders
Anorexia, Nausea, and Vomiting
Diarrhea
Constipation
Fluid and Electrolyte Imbalances
Pain
Malnutrition
Basic Diagnostic Tests
Common Therapies
Upper Gastrointestinal Tract Disorders
Disorders of the Oral Cavity
Dysphagia
Esophageal Cancer
Hiatal Hernia
Gastritis
Peptic Ulcer
Gastric Cancer
Dumping Syndrome
Pyloric Stenosis
Disorders of the Liver and Pancreatic
Gallbladder Disorders
Jaundice
Hepatitis
Cirrhosis
Liver Cancer
Acute Pancreatitis
Pancreatic Cancer
Lower Gastrointestinal Tract Disorders
Celiac Disease
Chronic Inflammatory Bowel Disease
Appendicitis
Diverticular Disease
Colorectal Cancer
Intestinal Obstruction
Peritonitis

- **Blood & Lymph Disorders**
  Review of the Blood
  Blood
  Review of the Lymphatic System
  Blood Dyscrasias
  The Anemias
  Hemolytic Anemias
  Polycythemia
  Blood Clotting Disorders
  The Leukemias
Lymphatic Disorders
- Lymphomas
- Multiple Myeloma or Plasma Cell
- Myeloma

- **Cardiovascular Disorder**
  - Review of the Normal Cardiovascular System
    - Heart
    - Blood Vessels
    - Blood Pressure
  - Heart Disorders
    - Diagnostic Tests for Cardiovascular Function
  - General Treatment Measures for Cardiac Disorders
  - Coronary Artery Disease (CAD) or Ischemic Heart Disease (IHD)
  - Cardiac Arrhythmias (Dysrhythmias)
  - Congestive Heart Failure
  - Congenital Heart Defects
  - Inflammation and Infection in the Heart
  - Vascular Disorders
    - Arterial Diseases
    - Venous Disorders
  - Shock

- **Urinary System Disorder**
  - Review of the Urinary System
  - Incontinence and Retention
  - Diagnostic Tests
    - Urinalysis
    - Blood Tests
    - Other Tests
  - Diuretic Drugs
  - Dialysis
Disorder of the Urinary System
  Urinary Tract Infections
  Inflammatory Disorders
Urinary Tract Obstructions
  Urolithiasis (Calculi of Kidney Stones)
  Hydronephrosis
  Tumors
Vascular Disorders
  Nephrosclerosis
Congenital Disorders
  Adult Polycystic Kidney
  Wilms’ Tumor
Renal Failure
  Acute Renal Failure
  Chronic Renal Failure

- **Fluid, Electrolyte and Acid-Base Imbalance**
  Fluid Imbalances
    - Review of Fluid balances
    - Fluid Excess – Edema
    - Fluid Deficit – Dehydration
    - Third-Spacing: Fluid Deficit and Fluid Excess
  Electrolyte Imbalances
    - Sodium Imbalances
    - Potassium Imbalances
    - Calcium Imbalances
    - Other Electrolytes
  Acid-Bas Imbalance
    - Review of Acid-Base Balance
    - Control of Serum pH
    - Acid-Base Imbalances

**Learning activities:**

Discussions/Journal Entries
Outline lecture
Sample Questions composed by students

Rev 1/13
Exams/Quizzes

*Instructional Delivery:*

Web Instruction

*Bibliography:*

*Pathophysiology for the Health Professions,* By Barbara E. Gould, 3rd Edition, W.B. Saunders Company

The following rubric will be used to evaluate sample questions:

<table>
<thead>
<tr>
<th>Score/Sample Questions</th>
<th>Content Included</th>
<th>Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>The questions show extensive use of the readings and course materials.</td>
<td>The questions are clearly written, correctly phrased, and contain no grammar or spelling errors that would serve to undermine the clarity of the questions.</td>
</tr>
<tr>
<td>2</td>
<td>The questions show use of the readings and course materials.</td>
<td>The questions are clearly written, correctly phrased, and contain few grammar or spelling errors that would serve to undermine the clarity of the questions.</td>
</tr>
<tr>
<td>1</td>
<td>The questions illustrate that its author has read the readings.</td>
<td>The questions have some clarity flaws but it is still possible to comprehend what the author intends.</td>
</tr>
<tr>
<td>Score/Answers</td>
<td>Content Included</td>
<td>Style</td>
</tr>
<tr>
<td>---------------</td>
<td>------------------</td>
<td>-------</td>
</tr>
<tr>
<td>0</td>
<td>The questions are not accurate; no questions were created; or the questions were copied from another source and were not the creation of the student (plagiarism).</td>
<td>The questions have many style flaws; no questions were created; or the questions were copied from another source and were not the creation of the student (plagiarism).</td>
</tr>
<tr>
<td>3</td>
<td>The answers show extensive use of the readings and course materials.</td>
<td>The answers are clearly written, correctly phrased, and contain no grammar or spelling errors that would serve to undermine the clarity of the answers.</td>
</tr>
<tr>
<td>2</td>
<td>The answers show use of the readings and course materials.</td>
<td>The answers are clearly written, correctly phrased, and contain few grammar or spelling errors that would serve to undermine the clarity of the answers.</td>
</tr>
<tr>
<td>1</td>
<td>The answers illustrate that its author has read the readings.</td>
<td>The answers have some clarity flaws but it is still possible to comprehend what the author intends.</td>
</tr>
<tr>
<td>0</td>
<td>The answers are not accurate; no answers were created; or the answers were copied from another source and were not the creation of the student (plagiarism).</td>
<td>The answers have many style flaws; no answers were created; or the answers were copied from another source and were not the creation of the student (plagiarism).</td>
</tr>
<tr>
<td>Score/Answer Key</td>
<td>Content Included</td>
<td>Style</td>
</tr>
<tr>
<td>2</td>
<td>The answer key is included.</td>
<td>All of the answers provided in the key are correct.</td>
</tr>
<tr>
<td>Score/One Correct Answer Per Question</td>
<td>Content Included</td>
<td>Style</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>------------------</td>
<td>-------</td>
</tr>
<tr>
<td>1</td>
<td>The answer key is included.</td>
<td>All of the answers except one are correct on the key or a question has fewer than three answer choices.</td>
</tr>
<tr>
<td>0</td>
<td>The answer key is included but two or more answers are incorrect; no answer key was created; or the answers were copied from another source and were not the creation of the student (plagiarism).</td>
<td>Two or more answers are incorrect on the answer key; no answer key was created; or the answers were copied from another source and were not the creation of the student (plagiarism).</td>
</tr>
</tbody>
</table>

The following rubric will be used to evaluate the **Journal Entries**:

<table>
<thead>
<tr>
<th>Score/Entry</th>
<th>Content Included</th>
<th>Style</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

The following rubric will be used to evaluate the **Journal Entries**:

<p>| Grading Rubric for Journal Entries (10 points) |
|-----------------------------------------------|------------|</p>
<table>
<thead>
<tr>
<th>Score/Entry</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score/Citation</td>
<td>Content Included</td>
<td>Style</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------------------------------------------</td>
<td>------------------------------------------------------------</td>
</tr>
<tr>
<td>8</td>
<td>The entry shows extensive use of the readings and course materials. Sound analysis of the materials is employed.</td>
<td>The entry is clearly written and contains no grammar or spelling errors that would serve to undermine the clarity of the entry.</td>
</tr>
<tr>
<td>6</td>
<td>The entry shows use of the readings and course materials. Sound analysis of the materials is employed.</td>
<td>The entry is clearly written and contains few grammar or spelling errors that would serve to undermine the clarity of the entry.</td>
</tr>
<tr>
<td>4</td>
<td>The entry illustrates that its author has read the readings. Some analysis of the materials is employed.</td>
<td>The entry has some clarity flaws but it is still possible to comprehend what the author intends.</td>
</tr>
<tr>
<td>2</td>
<td>The entry is brief but factually correct and relevant statements are made.</td>
<td>The entry has many clarity flaws and it is almost impossible to comprehend what the author intends.</td>
</tr>
<tr>
<td>0</td>
<td>The entry is very brief and not necessarily accurate; no entry was made; the question was not answered; or the content was copied from a source without quotes, presenting it as one's own words (plagiarism).</td>
<td>The entry has many style flaws; no entry was made; or the content was copied from a source with no attempt to summarize in one's own words.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Score/Citation</th>
<th>Content Included</th>
<th>Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>The citation(s) was/were directly related to the topic.</td>
<td>The post included a detailed statement explaining its relevance.</td>
</tr>
<tr>
<td>1</td>
<td>The citation(s) was/were indirectly</td>
<td>The post included a brief</td>
</tr>
<tr>
<td>Count</td>
<td>Description</td>
<td>Statement explaining its relevance.</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>0</td>
<td>The citation(s) was/were not related to the topic; or, no citation was posted.</td>
<td>The post included no statement explaining its relevance.</td>
</tr>
</tbody>
</table>