

**UNIVERSITY OF THE SACRED HEART  
DEPARTMENT OF NATURAL SCIENCES  
NURSING PROGRAM**

**SYLLABUS**

<b>TITLE</b>	:	Pathophysiology
<b>CODE</b>	:	ENF 230
<b>PREREQUISITES</b>	:	BIO 102
<b>CO-REQUISITES</b>	:	ENF 101, ENL 101, ENF 231
<b>CREDITS</b>	:	Three (3) credits, 45 hours

**DESCRIPTION**

The purpose of this course is to develop necessary learning skills by taking into consideration the different stages of a person's growth and development. The human being is a holistic creature, affected by interactions with its surroundings and society, by deviations in the health- illness continuum, and the diversity of the ethical, moral, and legal aspects of existence. The experiences provided by the study of nursing will be the means to develop and focus on those conducts and stimuli which relate to alterations in the physiological functioning of the human organism, in order to determine further course of action with regard to diagnosing and treating the condition(s) found during the learning process.

**JUSTIFICATION**

The human being grows, develops, and faces alterations or deviations in its health-illness continuum. This requires the development of skills and learning related to address such change. It is therefore important that students of nursing acquire a broad knowledge of the etiology of diseases, and how this affects the human organism. Clinical evidence and different approaches, together with a holistic view of the person, constitute important factors in the treatment of illness considered as the result of biological, psychological, social, and spiritual causes.

**COMPETENCIES, LEVEL II**

At the end of the course, the student will be qualified to:

1. Promote and further the results for providing safe quality care to diverse groups of the population. *Ess. I*

2. Integrate evidence, clinical judgment, professional perspective, and take into account client preferences in planning, implementing, and evaluating the results of patient care. *Ess. III*
3. Recognize the role of information technology in improving the results in client care by creating a safe environment for such care. *Ess. IV*
4. Evaluate protective and predictive factors, including genetic ones, that influence the health of individuals, families, groups, communities, and the general population. *Ess. VII*
5. Evaluate beliefs concerning health, illness, values, attitudes, and practices of individuals, families, groups, communities, and the general population. *Ess. VII*
6. Carry out activities to prevent unsafe, illegal, and unethical health care practices. *Ess. VII*
7. Apply the knowledge of human growth and development, pathophysiology, pharmacology, and management of nursing practices in order to provide a holistic evaluation centered on the client. *Ess. IX*

## PROFESSIONAL STANDARDS AND GUIDES

The curriculum is guided by the following publications:

American Association of Colleges of Nursing: *The Essentials of Baccalaureate Education for Professional Nursing Practice*. Washington, D.C. 2008.

American Nursing Association: *Guide to the Code of Ethics for Nurses: Interpretation and Application*. Washington D.C. 2010

American Nurses Association: *Nursing: Scope and Standards of Practice*, 2<sup>nd</sup> ed. Washington D.C. 2010.

*Nursing's Social Policy Statement: the Essence of the Profession*, 3<sup>rd</sup>. edition. Washington D.C. 2010.

## CONTENTS

### I. Basic concepts of pathophysiology

#### A. Genes and hereditary diseases

1. DNA, RNA, and proteins: hereditary transmission at the molecular level
2. Chromosomes
3. Elements of formal genetics
4. Transmission of genetic diseases
5. Ligament and genetic map analysis
6. Multiple hereditary factors

#### B. Cellular and altered tissue biology

1. Cellular adaptation
2. Cellular lesions

3. Cellular lesion evidence
4. Cellular death
5. Aging and altered cellular and tissue biology
6. Somatic cell death

## II. Physiological adaptation mode: fluids and electrolytes, acids and bases process complex

- A. Body fluid distribution
- B. Geriatric concerns: the aging process and the distribution of body fluids
- C. Alterations in water movement
- D. Balance of sodium, chlorine, and water
- E. Alterations in the balance of sodium, chlorine, and water
- F. Alterations in potassium and other electrolytes
- G. Acid base balance

## III. Physiological adaptation mode: basic need, protection

- A. Innate immunology: inflammation and healing of wounds
  1. Human defense mechanisms
  2. Innate immunity
  3. Chronic acute inflammation
  4. Wound scarification
  5. Geriatric concerns: age-related factors affecting innate immunity in the elderly
- B. Adaptive immunity
  1. The third line of defense: adaptive immunity
  2. Antigen and immunogenic response
  3. Humoral immune response
  4. Cellular-related immunity
  5. Immune response: B and T cell cooperation
  6. Geriatric concerns: age-related factors affecting self-defense mechanisms
- C. Infection and defects in defense mechanisms
  1. Infection
  2. Immunity deficiencies
  3. Hypersensitivity: allergies, autoimmune defenses, and alloantibodies
- D. Stress and illness
  1. Historical background and general concepts
  2. Overview of stress: mediating factors and systems
  3. Response to stress
  4. Stress, personality factors, facing stress related issues, and illness
  5. Geriatric concerns: aging and the age-related stress syndrome

## IV. Cancer cell kinetics

- A. Biology, clinical evidence, and treatment of cancer
  1. Terminology and characteristics of cancer
  2. Cancer cell biology

3. Cancer invasion and metastasis
  4. Clinical evidence and treatment of cancer
  - B. The epidemiology of cancer: genes, and lifestyle-environment risk factors
- V. Physiological adaptation mode: neurological factors, and the senses process complex
- A. Structure of the neurological system
    1. Overview and organization of the nervous system
    2. Cells of the nervous system
    3. The nervous impulse
    4. The central nervous system
    5. The peripheral nervous system
    6. The autonomic nervous system
    7. Geriatric concerns: aging and the nervous system
  - B. Pain, body temperature, sleep and the sensory function
    1. Pain
    2. Regulation of body temperature
    3. Sleep
    4. The special senses
    5. Geriatric concerns: aging and changes in hearing, smell, and taste
    6. Somatic sensorial function
  - C. Conduct assessment, stimuli, diagnosis, and treatment of the cognitive system, the cerebral hemodynamics, and motor skill function
    1. Alterations in cognitive systems
    2. Alterations in cerebral hemodynamics
    3. Alterations in motor skill functions
    4. Alterations in the motor skills complex
    5. Extrapyramidal motor syndromes
  - D. Disorders of the central and peripheral nervous systems, and the neuromuscular nexus
    1. Disorders of the central nervous system
    2. Disorders of the peripheral nervous system and the neuromuscular nexus
    3. Tumors of the central nervous system
- VI. Physiological adaptation mode: the endocrine function process complex
- A. Hormonal regulation
    1. Hormonal regulation mechanisms
    2. Structure and function of the endocrine glands
    3. Geriatric concerns: aging and its effects on specific endocrine glands
  - B. Conduct assessment, diagnosis, stimuli, and treatment of hormonal regulation
    1. Mechanisms of hormonal change
    2. Alterations in the hypothalamic-pituitary system
    3. Alterations in the thyroid function
    4. Alterations in the parathyroid function

5. Alterations in the pancreatic endocrine function
6. Alterations of the adrenal function

VII. Physiological adaptation mode: basic need, oxygenation

- A. Structure and function of the hematological system
  1. Components of the hematological system
  2. Blood cell development
  3. Homeostatic mechanisms
  4. Aging and changes in hematological values
- B. Conduct assessment, diagnosis, stimuli, and treatment of the hematological function
  1. Erythrocyte function disruption
  2. Myeloproliferative red blood cell disorders
  3. Alterations in leucocyte function
  4. Alterations in lymphatic function
  5. Alterations in spleen function
  6. Alterations in platelet and coagulation functions

VIII. Physiological adaptation mode: basic need, oxygenation

- A. Structure and functions of the cardiovascular and lymphatic systems
  1. The circulatory system
  2. The heart
  3. Systemic circulation
  4. The lymphatic system
- B. Conduct assessment, diagnosis, stimuli, and treatment of the cardiovascular function
  1. Diseases of the veins
  2. Diseases of the arteries
  3. Disorders of the cardiac wall
  4. Evidence of heart disease
  5. Shock

IX. Physiological adaptation mode: basic need, oxygenation

- A. The pulmonary system
  1. Structure of the pulmonary system
  2. Function of the pulmonary system
  3. Geriatric concerns: aging and the pulmonary system
- B. Conduct assessment, diagnosis, stimuli, and treatment of the pulmonary function
  1. Clinical evidence of alterations in pulmonary function
  2. Disorders of the thorax and the pleural wall
  3. Pulmonary disorders

X. Physiological adaptation mode: basic need, elimination

- A. Structure of the renal and urological systems

1. Structure of the renal system
2. Renal blood flow
3. Kidney function
4. Renal function test
5. Geriatric concerns: aging and renal function

B. Conduct assessment: diagnosis, stimuli, and treatment of the urinary and renal tracts

1. Urinary tract obstruction
2. Urinary tract infection
3. Glomerular disorder
4. Acute renal lesion
5. Chronic renal lesion

XI. Physiological adaptation mode: endocrine function process complex

A. Structure and function of the reproductive systems

1. Development of the reproductive systems
2. The female reproductive system
3. Structure and function of the mammary glands
4. The male reproductive system
5. Aging and the reproductive function

B. Conduct assessment: diagnosis, stimuli, and treatment of the reproductive systems, including sexually transmitted infectious diseases

1. Alterations in sexual maturity
2. Disorders of the female reproductive system
3. Disorders of the male reproductive system
4. Disorders of the mammary glands
5. Sexually transmitted infections

XII. Physiological adaptation mode: basic need, nutrition

A. Structure and function of the digestive system

1. The gastrointestinal tract
2. Organs of the digestive system
3. Geriatric concerns: aging and the gastrointestinal system

B. Conduct assessment: diagnosis, stimuli, and treatment of the digestive function

1. Disorders of the gastrointestinal tract
2. Disorders of the organs of the digestive system
3. Cancer of the digestive system

XIII. Physiological adaptation mode: basic needs, protection, physical activity, and rest

A. Structure and function of the musculoskeletal system

1. Structure and function of the bones
2. Structure and function of the joints
3. Structure and function of the skeletal muscles

- B. Conduct assessment: diagnosis, stimuli, and treatment of the musculoskeletal function
  - 1. Musculoskeletal lesions
  - 2. Bone disorders
  - 3. Joint disorders
  - 4. Musculoskeletal disorders
  - 5. Musculoskeletal tumors
  
- C. Structure, function, and disorders of the integument
  - 1. Structure and function of the skin
  - 2. Geriatric concerns: ageing and changes in skin integrity
  - 3. Skin disorders
  - 4. Hair disorders
  - 5. Nail disorders

## **METHODOLOGY**

### **ON SITE TRAINING COURSES**

- Conferences
- Use of algorithms
- Demonstrations
- Lectures and study guides
- Multimedia and film material
- Health care plans
- Case studies
- Critical thought questions

### **ONLINE COURSES**

- Lectures
- Use of algorithms
- Presentations
- Videos
- Website links
- Forums: social interaction, discussion groups, question and answer sessions
- Tasks: individual and/or group study guides, analysis of assigned reading, case study discussion, critical thought and evidence based questions

## **STUDENT EVALUATION**

### **ON SITE**

- Partial examinations 40%
- Assignments 35%
  - Active classroom participation 5%
  - Study guides 10%
  - Thought provoking questions 10%
  - Case studies 10%

Final examination 25%

**Total 100%**

#### **ON LINE**

Partial examinations 40%

Assignments 35%

Forums 5%

Guides 10%

Critical thinking questions 10%

Case studies 10%

Final examination 25%

**Total 100%**

#### **ASSESSMENT**

Immediate written reaction

Focalized list

SQA

Conceptual map

#### **BIBLIOGRAPHY**

#### **TEXTBOOK**

Huether, S.E., and McCance, K.L. *Understanding Pathophysiology*, 5<sup>th</sup> ed. Saint Louis: Mosby-Elsevier. 2014.

#### **REFERENCE BOOKS**

Kee, J.L., Hayes, E.R., and Mc Couston, L.E. *Pharmacology: A Nursing Process Approach*, 7<sup>th</sup> ed., Saint Louis: Elsevier Sounders. 2012.

Lewis, S.L., Dirksen, S.R., Heitkemper, M.L., Bucher, L. and Camera, I. *Medical-surgical Nursing: Assessment and Management of Clinical Problems*, 9<sup>th</sup>.ed. Saint Louis: Mosby-Elsevier. 2013.

Porth, C. *Essentials of Pathophysiology: Concepts of Altered Health States*, 4<sup>th</sup> ed. New York: Lippincott's Course Point. 2014.

Solomon, E.P., Berg, L.R., and Martin, D.W. *Biology*, 9<sup>th</sup> ed. Philadelphia: Saunders College Publishing. 2010.

Tortora, G.J., and Derrickson, B. *Principles of Anatomy and Physiology*, 13<sup>th</sup> ed. Hoboken: Wiley. 2011. (Spanish edition available. 2013).



Van Leeuwen, A.M. and Poelhuis-Leth, *D.J. Davis's Comprehensive Handbook of Laboratory and Diagnostic Tests with Nursing Implications* 5<sup>th</sup> ed. Philadelphia: F.A. Davis. 2013

### **ELECTRONIC RESOURCE**

[www.qsen.org/competencies/](http://www.qsen.org/competencies/)

### **REASONABLE ACCOMODATION**

All students requiring ancillary services or special assistance should submit a request for the same at the Office of the Associate Dean for Student Affairs at the start of the course or soon thereafter, but no later than the third week of class.

### **ISSUES OF ACADEMIC HONESTY, FRAUD, AND PLAGIARISM**

Any student in violation of the prevailing guidelines in regard to honesty, fraud, and plagiarism, will be subjected to all or any of the following sanctions: he/she will receive a grade of zero in the assessment of the course, will have to repeat the course, will obtain a grade of "F in the course, and/or will be suspended or expelled, as set forth in the document on Academic Honesty Policy, number DAEE 205-001, effective as of August 2005.

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