

**INTER AMERICAN UNIVERSITY OR PUERTO RICO
METROPOLITAN CAMPUS
NATURAL SCIENCES DEPARTMENT
BIOMEDICAL SCIENCES PROGRAM**

SYLLABUS

I. GENERAL INFORMATION

Course Title	:	Human Anatomy & Physiology
Code and Number	:	BMSC 3012
Credits	:	Three (3)
Academic Term	:	
Professor	:	
Office Hours	:	
E-mail	:	

II. DESCRIPTION

Fundamental concepts of the endocrine, reproductive, cardiovascular, lymphatic, immune, excretory, respiratory and digestive systems of the human body, including pathophysiological considerations. Requires 30 hours of lecture and 45 hours of lab. Prerequisite: BMSC 3011.

III. TERMINAL OBJECTIVES

A. Terminals

At the end of the course, the student must be able to:

1. Recognize the anatomical and physiological terminology used to analyze and correlate the different systems studied in the course.
2. Correlate the different physiological mechanisms and how they contribute to maintain the homeostasis.
3. Explain the anatomy and physiology of the endocrine system.
4. Explain the anatomy and physiology of the cardiovascular system.
5. Explain the anatomy and physiology of the lymphatic system.
6. Explain the anatomy and physiology of the immune system.
7. Explain the anatomy and physiology of the respiratory system.
8. Explain the anatomy and physiology of the urinary system.
9. Explain the anatomy and physiology of the digestive system.

10. Explain the anatomy and physiology of the reproductive system.
11. The use of ethical reasoning for informed and responsible decision-making.

STUDENT PROFILE COMPETENCES ONCE EGRESSES THE COURSE:

1. Effective communication (written and verbal)
2. Develop a proactive attitude towards individual and collective problem prevention. (leadership skills)
3. The use of ethical reasoning for informed and responsible decision-making.
4. The use of laboratory techniques with precision and safety.
5. Problem solving using the appropriate methodology and integrating knowledge.
6. Analyze and use scientific information based on evidence, to validate scientific arguments.

IV. CONTENTS

A. Endocrine System

Purpose of the Endocrine System

1. Hormone classification
 - a. Aminoacids
 - b. Proteins
 - c. Peptids
 - d. Lipids
2. Hormonal action mechanism
 - a. Cyclic AMP
 - b. Genetic activation
3. Purpose of the Endocrine glands
 - a. Hypothalamus
 1. supraoptic nucleus
 2. paraventricular nucleus
 - b. Pituitary (Hypophysis)
 1. Adenohypophysis
 - a. growth hormone-GH
 - b. melanocyte stimulating hormone-MSH
 - c. thyroid stimulating hormone-TSH
 - d. adenocorticotropic hormone-ACTH
 - e. leutinizing hormone-LH
 - f. folicule stimulating hormone-FSH
 - g. prolactin

2. Neurohypophysis
 - a. antidiuretic hormone-ADH
 - b. oxytocin
3. Pineal
 - a. melatonin
4. Thyroid
 - a. thyroxine and triiodothyronine (T_3 y T_4)
 - b. calcitonin
5. Parathyroid
 - a. PTH
6. Thymus
 - a. Limosin
7. Adrenals
 - a. cortex
 1. zona glomerulosa-aldosterone
 2. zona fasciculata-cortisol
 3. zona reticularis-androgens y estrogens
 - b. medulla
 1. catecholamine-epinephrine y norepinephrine
8. Pancreas
 - a. insulin
 - b. glucagon
9. Ovaries
 - a. estrogens
 - b. progesterone
 - c. inhibin
10. Testicles
 - a. testosterone
 - b. inhibin
11. Other endocrine glands and their purpose
 - a. heart
 - b. kidney
 - c. placenta

4. Positive and negative feedback mechanism
5. Prostaglandins
6. Stress response
7. Alterations
 - a. Gigantism

- b. Acromegaly
- c. Cushing disease
- d. Simonds disease
- e. Hyperthyroidism
- f. Grave's disease
- g. Diabetes insipidus
- h. Diabetes mellitus

B. Cardiovascular System

Function of the Circulatory System

1. Blood composition
 - a. Plasma
 - b. Form Elements
2. Hematopoiesis
3. Coagulation
4. Acid-base balance
5. Cardiac structure
6. Cardiac cycle and changes in pressure
7. Cardiac sounds
8. Electric activity of the heart and EKG
9. Blood vessels
10. Lymphatic system
11. Cardiac Output
12. Cardiac frequency regulation and cardiac volume
13. Blood volume
 - a. Compartments
 - b. Pressures
 - c. Exchange between capillaries and tissues
 - d. Renal regulation of the blood volume
14. Vascular resistance
 - a. Peripheral resistance
 - b. Blood flow regulation
15. Exercise cardiac physiology
 - a. Skeletal muscle and heart blood flow
 - b. Circulation changes during exercise
16. Coronary, cerebral and skin circulation
17. Blood pressure
 - a. Regulation
 - b. Measurement
 - c. Protector reflexes
 - d. Pulse pressure
 - e. Mean arterial pressure
 - f. Hypertension, shock and congestive heart failure (CHF)

C. Lymphatic System

Purpose of the Lymphatic System

1. Components and related structures
 - a. Lymph vessels
 - b. Lymph nodes
 - c. Lymph
 - d. Spleen
 - e. Thymus
 - f. Tonsils
2. Function
3. Pathophysiologic conditions
 - a. Lymphadenitis
 - b. Lymphoma
4. Interaction with the immune system

D. Immune System

Purpose of the Immune System

1. Defense function
 - a. Cellular components
 - b. Hormonal components
2. Pathophysiologic conditions
 - a. Immunodeficiency
 - b. Hypersensibility

E. Respiratory System

Purpose of the Respiratory System

1. Structure
2. Thoracic cavity
3. Ventilation
 - a. Inspiration y expiration
 - b. Pressure changes
 - c. Compliance
 - d. Elasticity
 - e. Surfactant
 - f. Pulmonary function
 - g. Ventilation-perfusion
4. Pulmonary gas exchange
 - a. Oxygen pressure formula
 - b. Alveolar membrane gas exchange

5. Gas exchange in tissues
6. Gas transport in blood
 - a. Oxygen transport
 - b. Hemoglobin
 - c. Disociation curve
 - d. CO2 transport
7. Ventilation regulation
 - a. Neural control
 - b. Chemical control
 - c. Mechanoreceptors
 - d. Hypothalamic control and Limbic System

F. Urinary System

Purpose of the Urinary System

1. Kidney structure
2. Kidney function
 - a. Filtration
 1. Renal corpuscle anatomy
 2. Filtration
 3. Glomerular filtration rate (GFR)
 4. GFR regulation
 - b. Transepithelial Reabsorption-Transport
 - c. Secretion-Competence
 - d. Excretion
 1. Depuration and its use
 2. Urination
 - e. Nephron volume changes

G. Digestive System

Function of the digestive System

1. Functions and processes
2. Anatomy and function
 - a. Layers: mucosa, submucosa, muscularis y serosa
 - b. Esophagus and stomach
 - c. Small intestine
 - d. Large intestine
 - e. Liver, gallbladder and pancreas
3. Peristalsis
4. Secretions
5. Digestion y absorption

- a. Carbohydrates
 - b. Lipids
 - c. Proteins
6. Regulation
- a. Cephalic, gastric and intestinal phases
 - b. Enteric nervous system
 - c. Hormones

H. Reproductive System

Function of the Reproductive System

- 1. Sexual determination
- 2. Reproduction basic patterns
- 3. Hormonal control
- 4. Masculine reproductive system
- 5. Feminine reproductive system

V. ACTIVITIES

- 1. The methods used will be conferences, discussions, laboratory practices, demonstrations, assignments and programmed teachings.
- 2. The techniques used will be questions and answers, case studies, review sessions, problem solving and observation.
- 3. The materials used will be magic marker board, microscopes, models, textbook, laboratory manual, graphs, tables, diagrams, drawings, pictures, magazines, newspapers, and computers.

I. EVALUATION

** Partial exam I	100 points 20%
** Partial exam II	100 points 20%
** Partial exam III	100 points 20%
Final exam	100 points 20%
Final Laboratory grade	100 points 20%
Total	500 points

VII. SPECIAL NOTES

1. *Auxiliary services, or special needs*

Every student that requires auxiliary services, or special assistance will request them at beginning of the course, or when the applicant acknowledges what is needed, through the Professional Counselor Office Registry, Mr. Jose Rodriguez, located in the College Orientation Program.

2. *Honesty, fraud and plagiarism*

The lack of honesty, fraud and plagiarism and any other inadequate behavior corresponding academic labor constitute sanctionable major infractions by the Student General Regulation. These infractions could have a consequence of college suspension for a period no less than one-year, or permanent college expulsion.

3. *Use of electronic devices*

Cellular phones or other electronic devices will be deactivated during the teaching process because it may interrupt, or alter the environment. Electronic devices are also prohibited during evaluations, or exams.

VIII. EDUCATIONAL RESOURCES

Text: *Human Anatomy and Physiology 9th ed. 2012 Elaine Marieb, Katja Hoehn, Benjamin Cummings*

Lab Text. *Human Anatomy and Physiology Laboratory Manual 10th. ed. 2011 (cat version); Elaine Marieb*

ELECTRONIC RESOURCES

1. PHYB 402 Human Physiology II www.uic.edu/classes/phyb/phyb402dbh
2. Understanding the **Human** Body An Introduction to Anatomy and Physiology www.teach12.com/ttcx/CourseDescLong2.aspx?cid=160
3. YouTube Videos

IX BIBLIOGRAPHY

1. Anatomy & physiology *6th ed.* Thibodeau, Gary A., **QP34.5 .T49** 2007
2. Structure & function of the body *13th ed.* Thibodeau, Gary A., 1938-
QP34.5 .T5 2008
3. Human physiology : from cells to systems *6th ed.* Sherwood, Lauralee
QP34.5 .S48 2007

Others:

Principles of Anatomy and Physiology Gerard J. Tortora ,Bryan H. Derrickson
Wiley; 13 edition (January 4, 2011)

Fundamentals of Anatomy & Physiology plus Mastering a&P with e-text -- Access Card
Package (9th Edition) Benjamin Cummings; (February 13, 2011)

Revision date

December 19, 2016