

**University of Puerto Rico Medical Sciences Campus
School of Dental Medicine
Department of Physiology**

Course Syllabus (2012-2013)

Course Title:	Basic Human Physiology for Dental Students
Codification:	CBIO 7160
Contact Hours:	95 hrs. (lectures, review & test periods)
Prerequisite Courses:	Anatomy, Histology & Embriology, Biochemistry, Neuroanatomy
Co-requisites:	None
Faculty (Coordinator):	Carlos A. Jiménez Rivera, Ph.D. (787)758-2525 ext. 1676 carlos.jimenez8@upr.edu

Coordinator's Office & hours: A-688 & TBA

Course Description:

The course will offer basic physiological knowledge necessary to understand the essential facts and concepts of human physiology, in order to be able to make clinical judgments on a rational scientific basis. The course will be offered using different teaching modalities which include lecture and group discussions. The course originated from the need of dental students to have a basic understanding of the body function that enables them to make rational clinical judgments. These principles are necessary to understand the mechanisms of disease, the pharmacology, and treatments for pathological conditions. In this way, the students will acquire knowledge and develop the skills to integrate the function of the systems (Nervous, Cardiovascular, Respiratory, Renal, Gastrointestinal and Endocrine) and how they respond to a stimulus (pathological, aging, exercise or temperature). The concepts presented in this course are, therefore, are essential to the everyday practice of clinical dental medicine.

Competencies:

K2: Value the role of life long learning, self-assessment, and critical thinking as an integral part of professional behavior.

K4: Assess, interpret, and integrate findings geared towards the diagnosis and prevention of oral conditions in patients of all ages.

K5: Develop, present and discuss a treatment plan for all patients.

K6: Manage apprehension and pain in patients of all ages.

Expected Outcomes:

At the end of the course, the students will be able to describe, analyze and explain all the Physiological systems (cardiovascular, respiratory, renal, gastrointestinal, endocrine, reproductive and nervous systems), and compare all of them, under normal & pathological conditions. The course objectives and outcomes will be measured by analyzing, integrating and comparing the above mentioned concepts, which will be evaluated through multiple choice questions.

Terminal Objectives:

1. Demonstrate knowledge of the function of the cell membrane and the mechanisms cells communicate (intra- & intercellularly).
2. Explain the basis of neurophysiological responses after a stimulus.
3. Describe the morphological and functional characteristics of the three types of muscle in the body: skeletal, cardiac, and smooth muscle.
4. Understand the basic organization, properties, and function of the cardiovascular system.
5. Describe and analyze the function of the respiratory system.
6. Compare the physiological responses caused by acid or base disturbances.
7. Describe the function of the gastrointestinal system.
8. Name and analyze the structural-functional relationship of the renal system and its integrative function with other organ systems.
9. Describe the composition and function of the endocrine system and its role in the regulation of organic metabolism and energy balance.
10. Describe and compare the male and female reproductive systems.
11. Evaluate how each system responds to a specific stimuli, either physical or environmental, in young and elderly patients (aging population) and explain how the responses contribute to the etiology of disease.

Tentative Schedule (2012-2013):

Note: Meeting will be held in room A-225, from February 21 to May 28, 2013

<u>Theme</u>	<u>Faculty</u>		<u>Dates</u>
Introduction	Dr. Jimenez	0.5 hrs	2/21
Cell Physiology I	Dr. Miranda	2.5 hrs	2/21
Cell Physiology II	Escobales	3 hrs	2/26
Cell Signaling	Dr. J. Miranda	3 hrs	2/28
Neurophysiology	Dr. C. Jimenez & Dr. Miranda	10 hrs	3/5, 3/7, 3/12, 3/14
Muscle Physiology	Dr. G. Santacana	2 hrs	3/14
EXAM 1 (60 questions)		2.5 hrs (+ 0.5 hrs. preparation)	3/19 (Tuesday)
Cardiovascular	Dr. G. Santacana	10 hrs	3/21, 3/26, 4/1, 4/2
Respiration/AB	Dr. M.J. Crespo	12 hrs	4/2, 4/5, 4/8, 4/10, 4/12

EXAM 2 (60 questions) 2.5 hr 4/17 (Wednesday)
 (+ 0.5 hrs. preparation)

Renal	Dr. N. Escobales	10 hrs	4/22, 4/24, 4/26, 4/29
Gastrointestinal	Dr. W. Silva	10 hrs	4/29, 5/1, 5/3, 5/6
Review	Graduate Students	3 hrs	5/8

EXAM 3 (60 questions) 2.5 hr 5/10 (Friday)
 (+ 0.5 hrs. preparation)

Endocrine	Dr. C. Torres	10 hrs	5/13, 5/15, 5/17, 5/20
Bone physiology	Dr. G. Santacana	2 hour	5/20
Reproductive	Dr. A. Segarra	3 hrs	5/22

EXAM 4 (60 questions) 2.5 hr 5/28 (Tuesday)
 (+ 0.5 hrs. preparation)

Total 95 hrs

Lecture Periods by Dates and Hours:

Faculty	Theme	Hrs (pm)	Dates
C. Jiménez	Introduction	1:00-1:30	Feb 21
J. Miranda	Cell Physiol	1:30-4:00	Feb 21
N. Escobales	"	1:00-4:00	Feb 26
J. Miranda	Cell Signaling	1:00-4:00	Feb 28
C. Jimenez	Neuro	1:00-4:00	Mar 5
J. Miranda	Somatosensory	1:00-4:00	Mar 7
C. Jiménez	Neuro	1:00-4:00	Mar 12
C. Jiménez	"	1:00-2:00	Mar 14
G. Santacana	Muscle	2:00-4:00	Mar 14
EXAM 1	(60 questions)	1:00-3:30	Mar 19 (Tuesday)
G. Santacana	Cardio	1:00-4:00	Mar 21
"	"	1:00-4:00	Mar 26
"	"	1:00-4:00	Apr 1
"	"	1:00-2:00	Apr 2
M. Crespo	Respiration	2:00-4:00	Apr 2
"	"	1:00-4:00	Apr 5
"	"	1:00-4:00	Apr 8
"	"	1:00-4:00	Apr 10
M. Crespo	AB-balance	1:00-4:00	Apr 12

EXAM 2 (545)	(60 questions)	1:00-3:30	April 17 (Wednesday)
N. Escobales	Renal	1:00-4:00	Apr 22
"	"	1:00-4:00	Apr 24
"	"	1:00-4:00	Apr 26
"	"	1:00-2:00	Apr 29
W. Silva	GI	2:00-4:00	Apr 29
"	"	1:00-4:00	May 1
"	"	1:00-4:00	May 3
"	"	1:00-2:30	May 6
Graduate Students	REVIEW	1:00-4:00	May 8
EXAM 3 (545)	(60 questions)	1:00-3:30	May 10 (Friday)
C. Torres	Endo	1:00-4:00	May 13
C. Torres	"	1:00-4:00	May 15
"	"	1:00-4:00	May 17
"	"	1:00-2:00	May 20
G. Santacana	Bone	2:00-4:00	May 20
A. Segarra	Repro	1:00-4:00	May 22
EXAM 4 (545)	(60 questions)	1:00-3:30	May 28 (Tuesday)

Participating Faculty:

Dr. María J. Crespo, Lab. A667, Ext. 8078
 Dr. Walter Silva, Lab. A-688 Ext.1611
 Dr. Guido E. Santacana, Lab. A-644 Ext. 1644
 Dr. Carlos Jimenez, Lab. A-688 Ext. 1676- **Course Coordinator**
 Dr. Carlos Torres, Lab. A-659
 Dr. Annabell Segarra, Lab. A-691 Ext. 1965
 Dr. Nelson Escobales Lab. A-663 Ext 1612
 Dr. Jorge D. Miranda Lab. A-682, Ext. 1631 or 1878,

All of the above laboratories are located in the 6th floor of the Medical Sciences Building.

Instructional Strategies (Teaching Methods)

The course will be lecture-based. The students will meet with the faculty in charge to receive the specific objectives for the section, and the assigned readings. The material to be studied will be mostly from the textbook of the course. In addition, illustrations, slides, and handouts prepared by the staff could be used.

- LECTURE HOURS: 80 hrs. (84%)

- REVIEWS (by graduate students): 3 hrs. (3%)
- EXAMS (2.5 hrs/test): 10 HOURS + 2 hrs. preparation (13%)

Four (4) CUMULATIVE PARTIAL EXAMS: 10 HOURS + 2 hrs. preparation

TOTAL COURSE HOURS: 95 hrs.

Student progress will be evaluated by means of four multiple choice exams. The first exam (60 question items) will cover Cell Physiology, Neuro, and Muscle Physiology. The second exam will cover Cardio, Respiration, and Acid/Base Physiology, and 12 questions from the material previously evaluated in exam 1 (total questions = 60). The third evaluation will cover Renal and Gastrointestinal Physiology, plus 12 questions from material previously evaluated in exams 1 and 2 (total questions = 60). The final examination will include material from Endocrine, Bone and Reproductive Physiology, plus 12 questions from material previously evaluated in exams 1, 2 and 3 (total questions = 60). Exams II, III and IV are cumulative. This means that they will cover material from past examinations.

EXAM I: Membrane Physiology & Cell Signaling
 Muscle Physiology
 Neurophysiology
 Questions and Time: 60 multiple choice questions/ 2.5 hours

EXAM II (Cumulative): Cardiovascular Physiology
 Respiratory Physiology
 Acid-Base Physiology
 + approximately 12 questions from topics of exam I.
 Questions and Time: 60 multiple choice questions/ 2.5hours

EXAM III (Cumulative): Renal Physiology
 Gastrointestinal Physiology
 + approximately 12 questions from topics of exam I and II.
 Questions and Time: 60 multiple choice questions/ 2.5hours

EXAM IV (Cumulative): Endocrine Physiology

Bone Physiology

Reproductive Physiology

+ approximately 12 questions from topics of exam I-III.

Questions and Time: 60 multiple choice questions/ 2.5 hours

Reasonable Accommodation

Todo estudiante que presente una condición o situación de salud que lo cualifica ante la ley para recibir acomodo razonable, tiene el derecho de hacer su solicitud por escrito al Decano, Decano Asociado o Decano Auxiliar de Asuntos Estudiantiles de su Facultad, siguiendo el procedimiento establecido en el documento **Proceso de Tramitación de Acomodo Razonable del Recinto de Ciencias Médicas**. Copia de este documento se obtiene en el Decanato de Estudiantes del RCM localizado en el segundo piso del edificio de Farmacia (787-758-2525 ext. 5203), en cada Facultad, y en la página cibernética del RCM. La solicitud no exime al estudiante de cumplir con los requisitos académicos de los programas de estudio.

STUDENTS WITH A HEALTH CONDITION OR SITUATION THAT, ACCORDING TO THE LAW, MAKES THEM ELIGIBLE FOR REASONABLE ACCOMMODATION HAVE THE RIGHT TO SUBMIT A WRITTEN APPLICATION TO THE PROFESSOR AND THE DEAN OF THEIR FACULTY, ACCORDING TO THE PROCEDURES ESTABLISHED IN THE DOCUMENT "SUBMITTAL PROCESS FOR REASONABLE ACCOMMODATION OF THE MEDICAL SCIENCES CAMPUS". A FREE COPY OF THIS DOCUMENT MAY BE OBTAINED AT THE OFFICE OF THE DEAN FOR STUDENTS AFFAIRS, SECOND FLOOR OF THE PHARMACY BUILDING; PHONE 787-758-2525 EXT. 5203. A COPY MAY ALSO BE OBTAINED AT THE OFFICE OF THE FACULTY DEANS AS WELL AS IN THE MSC WEB PAGE. THE APPLICATION DOES NOT EXEMPT STUDENTS FROM COMPLYING WITH THE ACADEMIC REQUIREMENTS PERTAINING TO THE PROGRAMS OF THE MEDICAL SCIENCES CAMPUS.

Evaluation Procedures:

Examinations: At the end of the course, the accumulated points will be divided by the total number of questions (240). Students scoring above 90% will receive an A, students scoring 80 to 89, will receive a B, students scoring 70 to 79 will receive C, and students below 70% will receive F. A minimum of 70% is required to pass the course. **Student who fails to attain this level of performance will have the opportunity of taking a remedial summer course in an accredited institution in the US mainland.** The highest possible grade to be registered by the Physiology Department in the remedial course is a C. Students

who fail this remedial course will be referred to the Dean of the School of Dental Medicine for a final decision.

The final grade for the course will be calculated as follows:

(# of correct questions from Exam I)
+ (# of correct questions from Exam II)
+ (# of correct questions from Exam III)
+ (# of correct questions from Exam IV)

Total number of correct questions/240 x 100 = Final Grade (%)

Additional information:

1. The course consists of 80 contact hours in which the major areas of human physiology will be presented using a lecture-based format. **Attendance is mandatory.**
2. The coordinator will not entertain requests from students regarding exam questions from the faculty involved. The student must negotiate complaints about exam questions with the writer of the question. Discrepancies in the material found in books other than those assigned by the department will not be taken into consideration for adjustments. Students with requests on exam questions, have seven working days after the date of evaluation to clarify doubts with the faculty in charge of the particular area of concern. After this period, no request will be entertained. THERE WILL BE NO DISCUSSIONS OF EXAMINATIONS IN CLASS.
3. **No reposition examination** will be provided for students that fail the course. In event that some students fail to achieve the overall level of performance expected, the department will recommend a Summer Physiology course as a remedial activity in an accredited institution of the US.

Grading System:

THE PASSING GRADE FOR THE DENTAL PHYSIOLOGY COURSE CBIO 7160 WILL BE 70%.THE GRADING SYSTEM FOR THIS COURSE WILL BE AS FOLLOWS:

90%-100%	A
80%-89%	B
70%-79%	C
< 70%	F

An absence to any examination must be accompanied with an appropriate justification upon the review of the justification by the course coordinator and acceptance of the justification by the department. The student may be allowed to take a makeup exam at a date arranged with the coordinator or to count twice any of the other tests, at the discretion of the department.

No student will be allowed to take an exam if the student arrives 30 minutes after the start of the examination. Late arrival to an exam does not mean that the student will be allowed to remain extra time to finish the exam. The student will have only the remaining allotted time for the examination and the exam will be collected at the end of the established exam period.

Students that do not achieve the required performance by the end of the Respiratory physiology section will receive a letter or email from the coordinator of the course communicating the problem, and the Dental School will be duly notified for appropriate corrective actions. If the student fails the course CBIO 7160 (Basic Human Physiology for Dental Students), the opportunity to take a reposition course will be evaluated. **STUDENTS TAKING AND PASSING THE REMEDIAL COURSE FROM AN ACCREDITED INSTITUTION IN THE U.S. WILL BE GIVEN A MAXIMUM GRADE OF "C" IN THE COURSE.**

Statement on Ethics:

The written examinations are the means utilized by the Department to measure the student's performance in their educational experiences. It is our intention to guarantee that all students have the opportunity to demonstrate their academic achievements under the same circumstances, eliminating all possibility for unfair or unethical behavior. To attain this goal, we trust in our students' commitment to honesty and professional ethics. Should unethical behavior be observed, appropriate measures will be taken.

Should knowledge become available that dishonesty regarding any particular examination has occurred; the faculty of the course reserves the right to cancel the examination before or after it has been administered and to require a repeat exam or to completely disregard the exam from the course evaluation.

Academic Integrity

The University of Puerto Rico promotes the highest standards of academic and scientific integrity. Article 6.2 of the UPR Student Bylaws (Certification JS 13 2009–2010) states that "academic dishonesty includes but is not limited to: fraudulent actions, obtaining grades or academic degrees using false or fraudulent simulations, copying totally or partially academic work from another person, plagiarizing totally or partially the work of another person, copying totally or partially responses from another person to examination questions, making another person to take any test, oral or written examination on his/hers behalf, as

well as assisting or facilitating any person to incur in the aforementioned conduct". Fraudulent conduct refers to "behavior with the intent to defraud, including but not limited to, malicious alteration or falsification of grades, records, identification cards or other official documents of the UPR or any other institution." Any of these actions shall be subject to disciplinary sanctions in accordance with the disciplinary procedure, as stated in the existing UPR Student Bylaws.

DISCLAIMER: *The above statement is an English translation, prepared at the Deanship of Academic Affairs of the Medical Sciences Campus, of certain parts of Article 6.2 of the UPR Student Bylaws "Reglamento General de Estudiantes de la Universidad de Puerto Rico", (Certificación JS 13 2009-2010). It is in no way intended to be a legal substitute for the original document, written in Spanish.*

Required Textbook:

Vander's Human Physiology. The Mechanisms of Body Function. 12th edition. Eric P. Widmaier, Hershel Raff, Kevin T. Strang. McGraw-Hill, New York, NY. 2010.

Bibliography:

Medical Physiology. Walter F. Boron and Emile L. Boulpaep. Second Edition. Saunders Elsevier. Philadelphia, PA, 2011.

Berne and Levy Physiology. Koeppen and Stanton, Sixth Edition, 2010, Mosby Elsevier.

Physiology, Costanzo, Fifth Edition, 2011, Walters Kluwer/Lippincott Williams & Wilkins

Medical Physiology. Rhoades & Bell. Third Edition, 2009, Lippincott Williams & Wilkins.

Cardiovascular Physiology, Berne and Levy. Ninth Edition. Mosby, 2007.

Respiratory Physiology: The Essentials, West, 7th Edition, Williams and Wilkins, 2006.

Gastrointestinal Physiology, Johnson, 7th Edition, 2007, Mosby.

Endocrine Physiology, Porterfield and White, 3rd Edition, Mosby, 2007.

Some websites of interest:

1) Cardiovascular Physiology:
(www.nda.ox.ac.uk/wfsa/html/u10/u1002_01.htm)(www.cvphysiology.com)

2) Respiratory Physiology: (www.nda.ox.ac.uk/wfsa/html/u12/u1211_01.htm)
(www.acbrown.com)

3) Gastrointestinal Physiology: (http://physioweb.med.uvm.edu/gi_physiology/)

4) Endocrine Physiology: (www.hormone.org) (www.endo-society.org) and
(www.endocrinology.org)

5) Reproductive Physiology

<http://www.nlm.nih.gov/medlineplus/femalereproductivesystem.html>

http://en.wikibooks.org/w/index.php?title=Human_Physiology/The_female_reproductive_system&stable=0
