

**PHAR 5014**  
**Integrated Physiology and Therapeutics**  
**Fall 2017**

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**CLASS DAYS and TIME:** Tuesday and Thursday 10:00 AM-12:00 PM

**CLASSROOM:** Med. School Bldg. 2.663U

**COURSE FACULTY:**

Dr. Francis Lam, Course Director, 7-8319 (lamf@uthscsa.edu)  
Dr. Jean Bopassa, 7-0429, 7-0334 (bopassa@uthscsa.edu)  
Dr. William Clarke, 7-4171 (clarkew@uthscsa.edu)  
Dr. Ralph DeFronzo, 7-6691 (defronzo@uthscsa.edu)  
Dr. Peter Hornsby, 562-5080 (hornsby@uthscsa.edu)  
Dr. James Nelson, 562-6132 (nelson@uthscsa.edu)  
Dr. Luke Norton, 7-0739 (nortonl@uthscsa.edu)  
Dr. Martin Paukert, 562-4052 (paukertm@uthscsa.edu)  
Dr. Jason Pugh, 562-4040 (pughj@uthscsa.edu)

**OFFICE LOCATION and HOURS:** Dr. Lam: MCD 3.4, Greehey Campus. By appointment

**EMAIL:** See above

**TELEPHONE:** See above

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**READ THIS DOCUMENT CAREFULLY –  
YOU ARE RESPONSIBLE FOR ITS CONTENTS.**

**COURSE DESCRIPTION AND OBJECTIVES**

Integrated Physiology and Therapeutics is a 4.5-credit hour course that provides students with a base of knowledge in physiology and pharmacology taking an integrative approach to understanding experimental and clinical therapeutics. Primary focus will be on understanding normal physiologic functions, cellular mechanism underlying disease, and systematic consideration of the pharmacology, clinical applications, and toxicities of the major classes of drugs.

This required 4.5 credit hour course for Pharmacology and Physiology students is comprised of two sections, each covering major areas of physiology and pharmacology along with their corresponding therapeutics. The two sections are:

PHAR 5018 (Cardiovascular, Renal and Respiratory Physiology and Therapeutics), and PHAR 5019 (Metabolism, Hormones, GI Physiology and Therapeutics). Each section will also be offered separately as an independent elective for students from other programs within the Graduate School of Biomedical Science. This single syllabus is designed for both courses.

**Pre-requisites** – INTD 5000 or at the discretion of the course director

**Semester credit hours** – 4.5

By the end of this course, each student should be able to:

- Describe and discuss the normal physiology of the cardiovascular system and mechanisms underlying its major pathologies such as atherosclerosis, hypertension, heart failure and stroke, as well as the major classes of drugs (e.g. antihypertensives, anti-lipemics, anti-anginals, and anticoagulants) to treat these primary cardiovascular disorders.
- Describe and discuss the importance of the kidneys in maintaining body electrolyte and water balance, and examples of cardiovascular and kidney diseases that are targets for important therapeutic drugs such as the diuretics and ACE inhibitors.
- Describe and discuss the respiratory physiology and drugs used in the treatment of asthma and chronic obstructive pulmonary disease.
- Describe and discuss the functional role and pharmacological modulation of the autonomic nervous system will be discussed within the context of the cardiovascular (e.g. vascular tone, heart rate) and respiratory (e.g. airway tone) systems.
- Describe and discuss the mechanisms and regulation of digestion/acid secretion and nutrient absorption by the GI tract along with pharmacological management of GI diseases, including GERD, peptic ulcer.
- Describe and discuss the physiology of major endocrine systems, including pituitary, thyroid, GI and renal hormones.
- Describe and discuss the endocrine regulation of stress, blood sugar, male and female fertility, calcium balance, growth, pregnancy, and appetite.
- Describe and discuss the pharmacological approaches to management of diseases caused by defects in metabolism (e.g. diabetes) and hormonal regulation (e.g. thyroid disorders), as well as sex steroids and adrenal steroids.

## **COURSE ORGANIZATION**

**The main teaching modalities used in this course include:**

1) Conventional didactic lectures, and 2) Student participation and presentation

**Materials** – Handouts and assigned readings by faculty, where appropriate

**Computer Access** – Assigned readings can be access online

**Reading Assignments** – As assigned by faculty

## **ATTENDANCE**

This is a required course and class attendance is expected. In addition, part of the course grade will be based on participation in class discussion.

## **TEXTBOOKS**

**Required:** As assigned by faculty

**Recommended:** As assigned by faculty

## **GRADING POLICIES AND EXAMINATION PROCEDURES**

Each course/section will include at least one examination that, together with discussion participation, will be used to determine each student's overall course grade. The format of the examination will be at the discretion of the course faculty members.

### **Missed examination policy**

Make-up examinations **may** be offered in case of emergencies at the discretion of the course director. A phone call (210-373-7412) or email to the course director **is required**. Failure to comply with the policies as outlined above will result in a score of 0 (zero) for the examination in question. If the student is allowed to take a make-up examination, it must be taken within one week of the original examination date. The format of make-up examination is at the discretion of the course director. The maximum percentage point obtainable on a make-up examination is 70%.

### **Grading System**

The final course grade will be assigned according to the grading system within the Graduate School of Biomedical Science as follows:

A = 90-100%    B = 80-89.9%    C = 70-79.9%    F = < 69.9%

### **REQUESTS FOR ACCOMODATIONS FOR DISABILITIES**

In accordance with policy 4.2.3, **Request for Accommodation Under the ADA and the ADA Amendments Act of 2008 (ADAAA)**, any student requesting accommodation must submit the appropriate request for accommodation under the American with Disabilities Act (ADA, form 100). to his/her appropriate Associate Dean of their School and a copy to the ADA Coordinator. Additional information may be obtained at <http://uthscsa.edu/eeo/request.asp>.

### **ACADEMIC INTEGRITY AND PROFESSIONALISM**

Any student who commits an act of academic dishonesty is subject to discipline as prescribed by the UT System Rules and Regulations of the Board of Regents. Academic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an exam for another person, signing attendance sheets for another student, and any act designed to give unfair advantage to a student or the attempt to commit such an act. Additional information may be obtained at

<http://catalog.uthscsa.edu/generalinformation/generalacademicpolicies/academicdishonestypolicy/>

### **TITLE IX AT UTHSCSA**

#### **Title IX Defined:**

Title of the Education Amendments of 1972 is a federal law that prohibits sex discrimination in education. It reads "no person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance."

#### **University of Texas Health Science Center San Antonio's Commitment:**

University of Texas Health Science Center San Antonio (UTHSCSA) is committed to maintaining a learning environment that is free from discriminatory conduct based on gender. As required by Title IX, UTHSCSA does not discriminate on the basis of sex in its education programs and activities, and it encourages any student, faculty, or staff member who thinks that he or she has been subjected to sex discrimination, sexual harassment (including sexual violence) or sexual misconduct to immediately report the incident to the Title IX Director.

In an emergency, victims of sexual abuse should call 911. For non-emergencies, they may contact UPD at 210-567-2800. Additional information may be obtained at <http://students.uthscsa.edu/titleix/>

## **EMAIL POLICY**

Every student is issued a University e-mail address and account at the time of enrollment. As a matter of University Policy, communications between students and faculty that occur using the student's University e-mail address is considered official business. Therefore, students are expected to check their university email inboxes on a regular basis so that any announcements, instructions, or information regarding this course will be received in a timely way. Missed communications due to inadequate monitoring of incoming emails on the University's email server will never be a valid excuse for unsatisfactory academic progress.

## **USE OF RECORDING DEVICES**

Recording of lectures and other learning activities in this course by any means (e.g., video, audio, etc.) is only permitted if approved by the instructor or required for compliance with Americans with Disabilities Act (ADA).

## **ELECTRONIC DEVICES**

Cell phones must be turned off during all class meetings and exams. Computers and electronic tablets are allowed only for participating in classroom activities (e.g., viewing slides presented in lecture or conference materials). No texting, tweeting, emailing, web-surfing, gaming, or any use of electronic devices that is not directly connected with classroom activities is permitted.

**PHAR 5014 Integrated Physiology and Therapeutics**

**TENTATIVE Fall 2017 CLASS SCHEDULE**

**Tuesday and Thursday 10:00 AM-12:00 PM**

<b>WEEK</b>	<b>DATE</b>	<b>TOPIC</b>	<b>Instructor</b>
<b>Week 1</b>	7/4/17	Independence Day – No class scheduled	
	7/6/17	CV System Overview	Bopassa
<b>Week 2</b>	7/11/17	Concept of Sufficient Blood Flow – The Fick Principle	Bopassa
	7/13/17	Cardiac Electrophysiology/Cardiac Cycle	Bopassa
<b>Week 3</b>	7/18/17	Pharmacological Management: Atrial Fibrillation and Arrhythmias	Lam
	7/20/17	QT Prolongation Studies in Drug Development	Lam
<b>Week 4</b>	7/25/17	Control of Cardiac Output	Bopassa
	7/27/17	Regulation of Coronary Blood Flow	Bopassa
<b>Week 5</b>	8/1/17	Pharmacological Management: Angina Pectoris	Lam
	8/3/17	Pharmacological Management: Heart Failure	Lam
<b>Week 6</b>	8/8/17	Peripheral Vascular Control & Blood Pressure Regulation	Bopassa
	8/10/17	Arterial Hypertension: Consensus, Controversy	Bopassa
<b>Week 7</b>	8/15/17	Pharmacological Management: Hypertension	Lam
	8/17/17	Neural mechanisms in Cardiovascular Regulation	Bopassa
<b>Week 8</b>	8/22/17	Integrative CV Function During Exercise & Hemorrhage	Bopassa
	8/24/17	Urinary System Overview	Pugh
<b>Week 9</b>	8/29/17	Glomerular Filtration & Renal Blood Flow Regulation	Pugh
	8/31/17	Transport of Na <sup>+</sup> and Cl <sup>-</sup> /Transport of Acids/Bases	Pugh
<b>Week 10</b>	9/5/17	Integration of Salt and Water Balance	Pugh
	9/7/17	Pharmacological Management: Diuretics	Lam
<b>Week 11</b>	9/12/17	Respiratory System Overview	Paukert
	9/14/17	Ventilation & Perfusion of the Lungs /O <sub>2</sub> & CO <sub>2</sub> Transport in Blood	Paukert
<b>Week 12</b>	9/19/17	Pharmacological Management of Asthma	Lam
	9/21/17	Pulmonary Gas Exchange/Respiratory Control of Acid/Base Balance	Paukert
<b>Week 13</b>	9/26/17	Respiratory Rhythmogenesis and Neural Control of Respiration	Paukert
	9/28/17	Examination	Lam
<b>Week 14</b>	10/3/17	Overview of the gastrointestinal system and digestion	Hornsby
	10/5/17	Normal functions of the stomach (acid production), the small intestine, the large intestine	Hornsby
<b>Week 15</b>	10/10/17	Neural and hormonal control of gastrointestinal functions; control of motility, peristalsis, vomiting	Hornsby
	10/12/17	Gastrointestinal pharmacology	Lam
<b>Week 16</b>	10/17/17	Adverse Drug Reactions Types and Implications for the GI Tract	Lam
	10/19/17	The Liver and Pharmacology	Lam
<b>Week 17</b>	10/24/17	GI Exam	Lam
	10/26/17	Obesity and metabolic complications and pharmacological management	Nelson/Clarke
<b>Week 18</b>	10/31/17	Regulation of glucose metabolism	Norton
	11/2/17	Hyperglycemia	DeFronzo
<b>Week 19</b>	11/7/17	Review/Catch Up	
	11/9/17	Thyroid	Nelson/Clarke

<b>Week 20</b>	11/14/17	Adrenal	Nelson/Clarke
	11/16/17	Review/Catch Up on Hormone section	Nelson/Clarke
<b>Week 21</b>	11/21/17	Thanksgiving Break	
	11/23/17	Thanksgiving Break	
<b>Week 22</b>	11/28/17	Male reproduction	Nelson/Clarke
	11/30/17	Female reproduction	Nelson/Clarke
<b>Week 23</b>	12/5/17	Review/Catch Up on Hormone section	Nelson/Clarke
	12/7/17	Self-Study	
<b>Week 24</b>	12/12/17	Hormone and Metabolism Exam	Lam
	12/14/17		