

## **Syllabus for PHOL402**

**Course number and title:** PHOL402A *Physiological Basis of Disease*

### **Lead instructor(s)**

**Course Directors:** William Schilling, Ph.D. [wps@case.edu](mailto:wps@case.edu)  
Andrea Romani, MD. [andrea.romani@case.edu](mailto:andrea.romani@case.edu)

<b><u>Participating Faculty</u></b>	<b>Location</b>	<b>Email</b>
William Schilling, Ph.D. Urinary/Renal Section Leader	Robbins E508	<a href="mailto:wps@case.edu">wps@case.edu</a>
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Andrea Romani, MD Cardiac Section Leader	Robbins E528	<a href="mailto:andrea.romani@case.edu">andrea.romani@case.edu</a>
George Dubyak, Ph.D. Cell Signaling-Cancer Section Leader	Robbins E520	<a href="mailto:gxd3@case.edu">gxd3@case.edu</a>
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### **Course description**

*Physiological Basis for Disease* is a graduate-level course designed to provide the fundamental physiology of a select group of organ systems and examples of how the molecular basis of disease affects physiological function of these systems. As such, PHOL402 will prepare students for future study in advanced biomedical sciences. The course is 3 credit hours and will be offered in the both the Fall (402A) and Spring (402B) semesters of each academic year. Course content of PHOL402 builds on knowledge learned in Medical Physiology-- PHOL481 and PHOL482, and is designed to be taken concurrently or in series with Medical Physiology courses. Topics to be covered during the Fall (402A) semester include pathophysiology of cancer, and select diseases of the central nervous system, cardiovascular system, and urinary/renal system. Topics to be covered in the Spring (402B) semester include select diseases of the respiratory, gastrointestinal, endocrine, and reproductive systems.

### **Prerequisites and/or intended student population**

There are no prerequisites for this course. This is a graduate level class and it is recommended that students have completed undergraduate level biology, chemistry, and physics courses appropriate for pre-medical or pre-dental programs. Completion of an undergraduate level mammalian physiology course or the concurrent enrollment in PHOL481 *Medical Physiology* is highly recommended, but not required.

### **Recommended and/or Required textbook(s) and/or other supplies**

Recommended reading will come from the online internal medicine textbook *UpToDate* which is freely available to all students at Case. Students must be connected to the Case network either on campus or via VPN to have free access. Some assigned readings will come from the *Nature Reviews of Medicine* series and other medical textbooks that are likewise freely available to Case students.

### **Class format and meeting times**

- The format for this class will be a combination of lectures, in class discussions, and take-home problem sets to facilitate student-directed learning.
- On Wednesday each week, a new topic will be introduced with a short lecture and a take-home Problem Set will be assigned.
- Students are encouraged to work collaboratively on the Problem Set.
- Students will be assigned to groups, and each week groups will receive a discussion topic to consider while completing their assignment.
- At the start of class on Monday, time will be allocated for groups to discuss their topics and put together a short presentation in the form of an outline to be added to a communal study guide (see below *Class Discussion*).
- The remainder of Monday class time will be dedicated to reviewing and discussing the Problem Set.
- On Wednesday during class, students will take a closed-book quiz.
- The quiz will typically be 20 questions long consisting of multiple choice and binary true/false questions; students will have 25 minutes to complete the Quiz.
- The quiz must be completed during the allotted in-class time, even for online students.
- Answers to the weekly quiz will be discussed in class on Wednesday followed by the short lecture introducing the next topic.
- Each class session will be approximately 1.5 hours.
- This sequence will continue throughout the semester.

**\*\*Class Discussion\*\*:** Students will be divided into discussion groups at the start of the semester. Each group will be assigned a topic to consider while completing the reading and problem set. In class on Monday each week, groups will work together for 10 - 15 min to generate an outline of important details from the reading related to their assigned topic. They will then present their outline to the class. This outline will become part of a communal study guide to be vetted by TAs and provided to the whole class to aid with preparation for the quiz. Each student must act as the spokesperson for their group at least once during the semester. Points for class discussion will be assigned based on completion of the weekly group discussions.

### **Assessment and grading**

**Take-home Problem Sets:** Take-home problem sets will contain 40-50 questions that will guide student reading/learning related to the assigned topic. Students are free to work individually or in groups to answer the problem sets. Problem sets must be submitted online by noon of the day for topic discussion (i.e, Monday). Failure to submit a problem set on time will result in a zero score for that problem set.

**Quizzes:** Weekly closed-book quizzes will contain 20 multiple choice questions and will be designed to be 25 minutes in duration. If a student misses a quiz for a valid reason (documented illness, family emergency, etc.), the course director must be notified by noon-time on the missed day (at the latest) to provide an excused absence. Students will be allowed to make-up quizzes for excused absences only. All make-up quizzes will be administered as soon as possible after the absence. Missed quizzes for unexcused absences will result in a zero score for that quiz.

### **Final Grading:**

Study Guides	5% of final score
Problem Sets:	25% of final score
Quizzes:	70% of final score

Grading Scale:	A, 85-100
	B, 70-85
	C, below 70

### **Resources available**

Canvas course management system will be used for communication with the students, including posting of reading assignments, Problem Sets and Quiz grades. There will be Teaching Assistants (TAs) assigned to the

class each semester. The TAs will assist the instructors, hold regular office hours and review sessions, and proctor and review all Quizzes.

## **Academic Integrity**

Integrity is a crucial part of the academic experience. You are expected to be honest with the course instructor in all conversations and discussions and to treat fellow students and instructors with respect. You must observe the University Academic Integrity Policy as found in the Case Western Reserve University Student Handbook, and on the University website. You must always do your own work (with exception of the problem sets), and you may never plagiarize or cheat on tests or papers. You may not solicit, obtain, possess or provide to another person an examination or portions of an exam or quiz, prior or subsequent to the administration of the exam or quiz. You may not obtain or provide test or quiz questions to or from other students in any form—oral, written or electronic. You may not obtain test questions (in any form) from previous students or graduates of the program. Failure to follow this policy could lead to an “F” in the course, dismissal from the MSMP program, and even expulsion from the University. By taking this course and by attending Case Western Reserve University you agree to these conditions.

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## **Course Schedule**

**Meeting Times: Mon and Weds 2:30-4:00 PM**

### **Fall 2020 (402A)**

<b><u>Date</u></b>	<b><u>Organ System</u></b>	<b><u>Topic</u></b>	<b><u>Instructors</u></b>
24-Aug	<u>Cell Signaling</u>	Course Introduction	Schilling/TAs
26-Aug		Assignment: Breast Cancer: Beyond the Basics	Dubyak
31-Aug		Discuss: Breast Cancer Problem Set	Dubyak
2-Sep		Quiz 1 (Breast Cancer); Assignment: Estrogen Receptor Biology & Cancer	Dubyak
7-Sep		Discuss: Estrogen Receptors & Cancer Problem Set	Dubyak
9-Sep		Quiz 2 (Estrogen Receptors); Assignment: HER-2 Receptors & Cancer	Dubyak
14-Sep		Discuss: HER-2 Receptors & Cancer Problem Set	Dubyak
16-Sep	<u>Nervous</u>	Quiz 3 (HER-2 Receptors & Cancer); Assignment: Parkinson Disease	Qi
21-Sep		Discuss: Parkinson Disease Problem Set	Qi
23-Sep		Quiz 4 (Parkinson); Assignment: Alzheimer's Disease	Qi
28-Sep		Discuss: Alzheimer's Disease Problem Set	Qi
30-Sep		Quiz 5 (Alzheimer's); Assignment: Huntington Disease	Qi
5-Oct		Discuss: Huntington Disease Problem Set	Qi
7-Oct	<u>Cardiovascular</u>	Quiz 6 (Huntington); Assignment: Cardiovascular Refresher	Romani
12-Oct		Discuss: Cardiovascular Refresher Problem Set	Romani
14-Oct		Quiz 7 (Cardiovascular Refresher); Assignment: Heart Failure: HFpEF	Romani
19-Oct		Discuss: HFpEF Problem Set	Romani
21-Oct		Quiz 8 (HFpEF); Assignment: HFrEF: Neurohumoral Adaptations	Stelzer
26-Oct		Discuss: HFrEF Problem Set	Stelzer
28-Oct		Quiz 9 (HFrEF); Assignment: Atrial Fibrillation	Stelzer
2-Nov		Discuss: Atrial Fibrillation Problem Set	Stelzer
4-Nov	<u>Urinary/Renal</u>	Quiz 10 (Atrial Fibrillation); Assignment: Kidney Refresher	
Schilling			
9-Nov		Discuss: Kidney Refresher Problem Set	Schilling
11-Nov		Quiz 11 (Kidney Refresher); Assignment: Hypotonic Hyponatremia	Schilling
16-Nov		Discuss: Hypotonic Hyponatremia Problem Set	Schilling
18-Nov		Quiz 12(Hypotonic Hyponatremia); Assignment: Proteinuria	Schilling
23-Nov – 26-Nov		<b>Thanksgiving Week - NO Class</b>	
30-Nov		Discuss: Proteinuria Problem Set	Schilling
2-Dec		Quiz 13 (Proteinuria); Assignment: PKD	Schilling
7-Dec		Discuss: PKD Problem Set	Schilling

## **Syllabus for PHOL402**

**Course number and title:** PHOL402B *Physiological Basis of Disease*

### **Lead instructor(s)**

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Andrea Romani, MD. [andrea.romani@case.edu](mailto:andrea.romani@case.edu)

### **Participating Faculty**

<b>Participating Faculty</b>	<b>Location</b>	<b>Email</b>
William Schilling, Ph.D.	Robbins E508	<a href="mailto:wps@case.edu">wps@case.edu</a>
Jessica C. Taylor, Ph.D. Pulmonary & Gastrointestinal Section Leader		<a href="mailto:jessica.c.taylor@case.edu">jessica.c.taylor@case.edu</a>
Andrea Romani, MD Gastrointestinal & Endocrinology Section Leader	Robbins E528	<a href="mailto:andrea.romani@case.edu">andrea.romani@case.edu</a>
George Dubyak, Ph.D. Genetic Disease & Immunology Lecturer	Robbins E520	<a href="mailto:qxd3@case.edu">qxd3@case.edu</a>
Sam Messiano, Ph.D. Reproductive Biology Section Leader		<a href="mailto:sam.mesiano@case.edu">sam.mesiano@case.edu</a>

### **Course description**

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9. The quiz must be completed during the allotted in-class time, even for online students.
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### **PHOL 402B *Physiological Basis of Disease***

#### **Course Schedule**

**Meeting Times: Mon and Weds 2:30-4:00 PM**

#### **Spring 2021 (402B)**

<b><u>Date</u></b>	<b><u>Organ System</u></b>	<b><u>Topic</u></b>
1-Feb	<b><u>Instructors</u></b> <i>Pulmonary</i> Schilling	Course Introduction
3-Feb	Dubyak	<b>Assignment:</b> <i>Genetic Diseases &amp; Immunology Primer</i>
8-Feb	Dubyak	<b>Discuss:</b> <i>Genetic Diseases and Immunology Problem Set</i>
10-Feb	Taylor	<b>Quiz 1 (Genetic Diseases and Immunology); Assignment:</b> <i>COVID-19</i>
15-Feb	Taylor	<b>Discuss:</b> <i>COVID-19 Problem Set</i>
17-Feb	Taylor	<b>Quiz 2 (COVID-19); Assignment:</b> <i>Cystic Fibrosis</i>
22-Feb	Taylor	<b>Discuss:</b> <i>Cystic Fibrosis Refresher Problem Set</i>
24-Feb	Taylor	<b>Quiz 3 (Cystic Fibrosis); Assignment:</b> <i>Asthma</i>
1-Mar	Taylor	<b>Discuss:</b> <i>Asthma Problem Set</i>
3-Mar	<i>Gastrointestinal</i> Taylor	<b>Quiz 4 (Asthma); Assignment:</b> <i>Gastroparesis</i>
8-Mar	Taylor	<b>Discuss:</b> <i>Gastroparesis Problem Set</i>
10-Mar	Taylor	<b>Quiz 5 (Gastroparesis); Assignment:</b> <i>Celiac Disease</i>
15-Mar	Taylor	<b>Discuss:</b> <i>Celiac Disease Problem Set</i>
17-Mar	Romani	<b>Quiz 6 (Celiac); Assignment:</b> <i>Alcoholic Liver Disease</i>

22-Mar		<i>Discuss: Alcoholic Liver Disease Problem Set</i>
	Romani	
24-Mar	<i>Endocrinology</i>	<i>Quiz 7 (Alcoholic Liver Disease); Assignment: Hashimoto &amp; Graves</i>
	<i>Disease</i>	
	Romani	
29-Mar		<i>Discuss: Hashimoto &amp; Graves Disease Problem Set</i>
	Romani	
31-Mar		<i>Quiz 8 (Hashimoto/Graves); Assignment: Familial Hypercalciuric</i>
	<i>Hypocalcemia (FHH)</i>	
	Schilling	
5-Apr		<i>Discuss: FHH Problem Set</i>
	Schilling	
7-Apr		<i>Quiz 9 (FHH); Assignment: Diabetic Ketoacidosis</i>
	Romani	
12-Apr		<i>Discuss: Diabetic Ketoacidosis Problem Set</i>
	Romani	
14-Apr		<i>Quiz 10 (DKA); Assignment: Type 2 Diabetes</i>
	Romani	
19-Apr		<i>Discuss: Type 2 Diabetes Problem Set</i>
21-Apr	<i>Reproductive Biology</i>	<i>Quiz 11 (Type 2 Diabetes); Assignment: Polycystic Ovary Syndrome</i>
	Mesiano	
26-Apr		<i>Discuss: Polycystic Ovary Syndrome Problem Set</i>
	Mesiano	
28-Apr		<i>Quiz 12 (Polycystic Ovary Syndrome); Assignment: Pre-eclampsia</i>
	Mesiano	
3-May		<i>Discuss: Pre-eclampsia Problem Set</i>
	Mesiano	
5-May		<i>Quiz 13 (Pre-eclampsia); Assignment: Hypogonadism</i>
	Mesiano	
10-May		<i>Discuss: Hypogonadism Problem Set</i>
	Mesiano	
12-May		<i>Quiz 14 (Hypogonadism)</i>