

# PCB3713C Cellular & Systems Physiology, Fall 2020

## Syllabus Policy

You are solely responsible for reading and following the instructions, guidelines and schedules in this syllabus, and for checking the e-Learning site at least weekly for announcements regarding any changes. Not having read the information in this syllabus or the announcements will not constitute an excuse for missing an assignment or deadline.

## Course Description

How cells, organs, and higher-level systems are integrated and coordinated in the functions of humans and other animals. Emphasis will be placed on the use of model organisms, mathematical models and the physical sciences to understand the mechanistic basis of normal physiology and dysfunction. 4 credits.

## Prerequisites

One semester of general biology (BSC 2010), and two semesters of general chemistry (CHM 2046 or CHM 2047 or CHM 2051 or CHM 2096) and two semesters of general physics with calculus (PHY 2049 or PHY 2061), all with a minimum grade of C.

## Corequisite

None

## Course Schedule

Section 25593 and 26577

Tuesdays and Thursdays, periods 5-6 (11:45a - 1:40p) online (Web)

## Instructors

### Course Instructor

David Julian, Ph.D. (Physiology)

Associate Professor, Department of Biology

Pronouns: he/him

Student hour: Tuesdays and Thursdays, period 7 (1:55p-2:45p)

Student hour location: <https://ufl.zoom.us/j/5996251956>

Contact: via Canvas messaging

### Course Graduate TA

Scott Cinel, M.S. (Entomology)

Ph.D. student, Department of Biology

Pronouns: he/him

Student hour: TBA

Contact: via Canvas messaging

### Course Undergraduate TA

Brianna Pawlyshyn

BME junior

Pronouns: she/her

Student hour: Tuesdays and Thursdays, period 4 (10:40a - 11:30a) and by appointment

Student hour location: <https://ufl.zoom.us/j/3045344180>

Contact: [bpawlyshyn@ufl.edu](mailto:bpawlyshyn@ufl.edu)

## Course Fee

There is no course fee and no course textbook, but you will need to purchase subscriptions for Osmosis (\$39.80), Top Hat (\$20), and JustPhysiology (\$15). Instructions for purchasing these subscriptions are below.

## Course Objectives

At the end of the course, students should be able to:

- Explain physiological mechanisms of humans and representative model organisms by applying basic principles of physics, chemistry, and engineering.
- Describe the fundamental mechanisms underlying normal function of cells, tissues, organs, and organ systems in humans and other animals.
- Explain the basic mechanisms of homeostasis by integrating the functions of cells, tissues, organs, and organ systems.
- Effectively solve basic problems in physiology, working independently and in groups.
- Apply knowledge of functional mechanisms and their regulation to explain the pathophysiology underlying common diseases.
- Generate hypotheses about physiological processes, design experiments to test these hypotheses using dynamic models of physiological systems, and then analyze, interpret, and report experimental results.

## Required Course Materials, Software, and Licenses

### Primary Course Content

Instead of using a standard textbook to provide the primary resources for course content, we will use the Osmosis medical education platform. This web and mobile-based resource provides high quality instructional videos and annotatable high-yield notes to supplement the videos, plus content review questions, and flashcards that allow adaptive learning. Videos and associated high-yield notes are listed for each course meeting. You are expected to view the assigned videos and familiarize yourself with the content prior to each class meeting.

Osmosis has comprehensive content on medical basic sciences, physiology, pathology, and pharmacology that is primarily targeted to medical students and other health professions, but for this course we will focus only on the subset of content for basic science and physiology. However, your subscription will provide you unrestricted access to all Osmosis content, should you choose to explore it. The reduced subscription cost for our course is \$39.80.

If you would like a printed “textbook,” you have the option of purchasing the Osmosis High Yield Physiology Notes for \$19.99 at <https://books.osmosis.org/>. The content is identical to the high yield notes that are available online as part of your Osmosis subscription. However, if prefer to have a hard copy for taking notes and studying, then purchasing the printed version from Osmosis is probably less expensive than printing out color copies of the notes yourself.

### **Active Learning System**

We will be using Top Hat Pro ([www.tophat.com](http://www.tophat.com)) for class participation. You will be able to submit answers to in-class questions online using your computer (and also via Apple or Android smartphones and tablets, but these will likely be irrelevant for most in-class activities). For instructions on how to create a Top Hat account and enroll in Top Hat Pro, refer to the invitation sent to your UF email address or consult Top Hat's Getting Started Guide (<https://bit.ly/31TGMLw>).

### **Peer-Review System**

We will use EduFlow to facilitate peer review of specific class assignments. EduFlow is a free, but you must register for it. To avoid problems, register well in advance of the draft report submission deadline.

### **Physiology Simulation System**

We will use JustPhysiology to conduct physiology experiments. The subscription is \$15. JustPhysiology is a web application based on the HumMod simulation engine, which has a mathematical model of human physiology that utilizes over 12,000 physiological variables. The model was initially developed at the University of Mississippi Medical Center.

Note that UF subscriptions are discounted. Dr. Julian is associated with HC Simulation LLC (the company that produces JustPhysiology) but will receive no financial benefit from subscriptions associated with this course.

### **Other Content**

All other digital content will be accessible from the Canvas website (<https://elearning.ufl.edu>).

## **Activities and Assessments**

The class content will include textbook reading, in-class lessons, in-class problem-based learning ("active learning" questions), experiments using physiological simulations, and writing and peer-review of research reports.

### **Problem-based Learning**

During most "lecture" sessions you will be asked to work with your classmates to answer questions and solve problems. You will use the active learning system to provide your answers. All problem-based learning question must be completed in-class unless indicated otherwise.

### **Research Report**

You will individually complete a research report during the term. For this report, you will be provided with a research problem about a physiological phenomenon. You are welcome to work on your proposal and reports with other students in the course, but the final product must represent your own work. You will be expected to do the following:

1. Develop a hypothesis for the assigned problem.
2. Design an experiment to test your hypothesis using the physiology simulation software.
3. Submit a short proposal to conduct your experiment. This will be evaluated by the graduate teaching assistant.

4. After the proposal is approved, conduct your experiment, collect and analyze the data, and draw conclusions from the results.
5. Craft a clear, well-supported first-draft report.
6. Submit your draft report. This will be scored through peer review and by the graduate teaching assistant.
7. Complete peer reviews of other students' draft reports.
8. Back-evaluate the peer reviews you received on your draft report.
9. Revise your draft report based on the peer reviews and graduate teaching assistant comments. This may involve designing and running new experiments.
10. Submit your final report for peer review. This will be scored through peer review and by the graduate teaching assistant.
11. Complete peer reviews of other students' final reports.
12. Back-evaluate the peer reviews you received on your final report.

Your proposal, draft research report and final research report must each be submitted as a PDF file and must be formatted according to the instructions provided for each, which will be posted on the course home page. Proposals and reports that are in a file format other than PDF or that are not formatted correctly may receive an automatic score of zero.

The proposal and all research reports, peer reviews, and back evaluations are due at 21:00:00 Eastern time on the date indicated in the syllabus schedule. The timestamp for every submission is based on the clock of the server, not the clock of the computer you are using. Local problems with your computer or your internet access will not be grounds for extending the deadline, so don't wait until the last few minutes to complete any submission.

The total grade for each research report will be determined from the following criteria:

- **Review Grade** - a combination of the Accuracy and Helpfulness grades, which are then curved, after which any Reviewing Late Penalties are subtracted.
- **Accuracy** - correlation of your own ratings to mean ratings by others on same documents.
- **Helpfulness** - how helpful the author thought your comments were via back evaluation.
- **Writing Grade** - average score given by reviewers which is then curved, and then any Writing Late Penalties are subtracted.
- **Task Grade** - accounts for the percentage of assigned reviews and back-evaluations that were done. It represents only your reviewing activities, which is then curved.
- **Weighting** - How each category is weighted. The breakdown is 40% reviewing, 40% writing, and 20% task.
- **Overall** - The sum of all of the weighted grades

The following are the submission steps for each of the report activities:

- The proposal must be submitted as an assignment in Canvas.
- The draft research must be submitted through EduFlow *and* as an activity in Canvas. To submit the draft research report in EduFlow, navigate to the [EduFlow course home page](#) and select the first activity, "Submit your first draft of the research report." This will allow you to upload your research report by clicking on "File" under the "Add an attachment" section.

- Once you submit your first draft, the next activity “Review peer first drafts” will become available. As other students submit their drafts, you will be allowed to review them anonymously. You will be assigned to review five reports.
- Once you have completed your peer reviews, the Instructor Review activity will become enabled and you will be provided with feedback from the graduate TA by completing this activity.
- You will then complete the feedback reflection activities. You will submit reflections based on the peer reviews you received and based on the graduate TA feedback.
- This process will be repeated for the final draft of your research report.

## Exams

There will be a midterm exam and a final exam. These will consist mostly of problem-based, multiple choice, fill-in-the-blank, ordering, and numeric (calculation) questions. The midterm will cover all course material through week 7, will consist of approximately 40 questions, will be administered during a normal lecture session (115 minutes in duration), and will be worth 100 points. The final exam will cover all course material from the entire term but will focus primarily on the last half of the course. It will also consist of approximately 40 questions and will be worth 100 points, but it will be administered during the final exam period (2 hours duration). Both exams will be closed-book and you will not be allowed to use notes, but you will be expected to utilize the physiology simulation software to answer some of the questions.

## Grading

### Assessments

Assessment Type	Quantity	Points	Subtotal	Pct of Total
Problem-based Learning	~100	1	100	25%
Research Report	1	100	100	25%
Midterm Exam	1	100	100	25%
Final Exam	1	100	100	25%
Total			400	100%

### Grade Distribution

Point Range (%)	Letter Grade
93.33 or higher	A
90-93.32	A-
86.66-89.99	B+
83.33-86.65	B
80-83.32	B-
76.66-79.99	C+
73.33-76.65	C
70-73.32	C-
66.66-69.99	D+

63.33-66.65	D
60-63.32	D-
< 60	E

Grades will not be assigned by a curve, but the grade cutoffs may be adjusted downward. In other words, if your final point accumulation is 93.33%, then you are guaranteed to receive an A. This means there is no upper limit to the number of “A” grades that can be assigned.

A “C-” is not a qualifying grade for critical tracking courses at UF. In order to graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). A “C-” average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. More information on grades and grading policies is here:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

### Extra Credit

There will be no opportunities for extra credit.

### Time Commitment

The UF College of Liberal Arts and Sciences assumes that you will devote 3-4 hours per week per credit-hour to each course during the regular fall and spring semesters. This course is 4 credits, so you should therefore expect to devote 12-16 hours per week to this course (for a total of 180-240 hours over the semester), of which only 4 hours per week will be spent in class. Therefore, you are responsible for budgeting more than 2/3 of the time you will spend on this course. If you find yourself spending more than 16 hours per week on average, discuss this with your course instructor to see if you can refine your work and study habits. If you find yourself spending less than 12 hours per week on average, you should recognize that you may have difficulty fully learning and comprehending the material in this time, which will probably be reflected in poor performance on the various activities and assessments, causing you to receive a lower overall course grade.

Activity	Minimum Time (Hours)
Lectures/problem-based learning	56
Viewing videos and reviewing notes	80
Research report	40
Midterm exam	2
Final exam	2
Total	180

### Communication

Updates and changes to the course schedule, this syllabus, and any other aspects of the class content and structure will be communicated to you via announcements on the course e-Learning site. You are responsible for checking this site regularly for announcements.

## Communicating electronically with the Instructor and Graduate Teaching Assistant

There are two primary modes of electronic communication for this class -- the discussion forum and Canvas mail. To ensure that your questions are answered as promptly as possible, please follow the communications guidelines below:

**Discussion Forum:** This course is participatory. Use the discussion forum on the course website for questions/answers about the course content, structure, assignments and activities. You are strongly encouraged to respond to your peers if you know the answer or can provide guidance. The course Graduate TA will monitor this area, but the TA may not be able to read every posting and therefore this should **not** be used to communicate with the instructors.

**Direct Canvas Mail to the Instructors:** Direct email to Dr. Julian or to the graduate teaching assistant should be used for messages that are **private** in nature or otherwise not appropriate for the been posted to the Discussion Forum. Use the Mail tool in Canvas for all such direct email. If you use any other email tool, it may be filtered as spam or otherwise not be seen by your instructors.

## Course Policies

### Academic Honesty

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The [Honor Code](#) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor.

### Policy on Absences and Make-up Work

Requirements for class attendance and make-up exams, assignments, and other work are consistent with [university attendance policies](#).

If you must miss an assignment or exam due to an allowable scheduled absence (for example, to participate in a sanctioned university function), you must notify the instructor as soon as the event is scheduled or during the first week of classes. If you miss an assignment or exam due to an allowable but unscheduled and unpredictable absence (e.g., illness), you must contact the instructor as soon as possible. In the case of illness, you must provide a signed note from your primary care provider indicating that you were unable to complete the assignment or take the exam on the day(s) in question.

### Late Work

Late work will not be accepted unless it is the direct result of an allowable but unscheduled and unpredictable absence (e.g., illness), as defined above, at the discretion of the instructor.

## Class Participation

Most class sessions will be conducted synchronously via the Zoom or Top Hat Slate videoconferencing platform. For these sessions, you are expected to be actively engaged with your video activated. You may use a simulated video background, but this must be selected from one of the default backgrounds in Zoom (you may not use a custom background). Your visible attire should be appropriate for attending a class and respectful to the other students.

## Privacy-related Issues

Our class sessions may be audio-visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, notify your instructor. Students who un-mute during class and participate verbally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

## Campus Resources

### Health and Wellness

- *U Matter, We Care*: If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575, or visit [U Matter, We Care website](#) to refer or report a concern and a team member will reach out to the student in distress.
- *Counseling and Wellness Center*: [Visit the Counseling and Wellness Center website](#) or call 352-392-1575 for information on crisis services as well as non-crisis services.
- *Student Health Care Center*: Call 352-392-1161 for 24/7 information to help you find the care you need, or [visit the Student Health Care Center website](#).
- *University Police Department*: [Visit UF Police Department website](#) or call 352-392-1111 (or 9-1-1 for emergencies).
- *UF Health Shands Emergency Room / Trauma Center*: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; [Visit the UF Health Emergency Room and Trauma Center website](#)

### Academic Resources

- *E-learning technical support*: Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).
- *Career Connections Center*: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
- *Library Support*: Various ways to receive assistance with respect to using the libraries or finding resources.
- *Teaching Center*: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.
- *Writing Studio*: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
- *Student Complaints On-Campus*: [Visit the Student Honor Code and Student Conduct Code webpage for more information](#).
- *On-Line Students Complaints*: [View the Distance Learning Student Complaint Process](#)



## Accommodations for Students with Disabilities

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure during the first week of classes or within one week of receiving their accommodation documentation from the DRC, whichever is later.

## Course Evaluation Process

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

## Course Schedule (subject to change)

All research report activities are due at 21:00:00 (09:00 PM) on the dates indicated in the last column below.

Week	Session	Date	Title	Research Report
1	1	1-Sep	Biology, chemistry and physics review	
			Evolution and natural selection	
			Gene regulation	
	2	3-Sep	Cellular structures and processes	
			Cellular Structure and Function	
			Selective permeability of the cell membrane	
			Cell-cell junctions	
			Osmosis	
			Resting membrane potential	
			Body fluid compartments	
Water shifts between body compartments				
2	3	8-Sep	Cell signaling pathways	
			<b>Endocrine system anatomy and physiology</b>	
			Pituitary hormones	
			Adrenocorticotrophic hormone	
			Growth hormone and somatostatin	
			Thyroid stimulating hormone	
	Thyroid hormone			
	4	10-Sep	Adrenal hormones	
			Cortisol	
			Pancreatic hormones	
			Glucagon	
			Insulin	
			Somatostatin	
			Calcium and phosphate regulation	
Calcitonin				
Parathyroid hormone				
3	5	15-Sep	<b>Nervous system anatomy and physiology</b>	
			Neuron action potential	
	6	17-Sep	Autonomic nervous system	
			Sympathetic nervous system	
			Parasympathetic Nervous system	
			Adrenergic receptors	
			Cholinergic receptors	
			Motor nervous system	
Motor cortex				
Motor neurons and muscle spindles				
4	7	22-Sep	Sensory nervous system	
			Sensory receptor function	
			Somatosensory pathways	

			Somatosensory receptors		
			Anatomy and physiology of the ear		
			Auditory transduction and pathways		
			Vestibular transduction		
	8	24-Sep			Olfactory transduction and pathways
					Taste and the tongue
					Anatomy and physiology of the eye
					Photoreception
5	9	29-Sep	<b>Musculoskeletal system anatomy and physiology</b>		
			Bones, joints, and cartilage		
			Slow twitch and fast twitch muscle fibers		
			Sliding filament model of muscle contraction		
			Muscle contraction		
			Neuromuscular junction and motor unit		
	10	1-Oct			<b>Cardiovascular system anatomy and physiology</b>
					Blood components and function
					Platelet plug formation (primary hemostasis)
					Lymphatic anatomy and physiology
6	11	6-Oct	Abnormal heart sounds		
			Cardiac electrophysiology		
			Action potentials in pacemaker cells		
			Action potentials in myocytes		
			Electrical conduction in the heart		
			Cardiac conduction velocity		
			Excitability and refractory periods		
			Cardiac excitation-contraction coupling		
			Cardiac length tension relationship		
			Cardiac contractility		
	Electrocardiography				
	ECG basics				
	12	8-Oct		Normal sinus rhythm	
				Hemodynamics	
				Blood pressure, blood flow, and resistance	
				Pressures in the cardiovascular system	
				Resistance to blood flow	
				Laminar flow and Reynolds number	
	7	13	13-Oct	Compliance of blood vessels	
				Blood pressure regulation	
Baroreceptors					
Chemoreceptors					
			Cardiac cycle		

9			Measuring cardiac output - Fick principle	Research Report Proposal (23-Oct)
			Stroke volume, ejection fraction, and cardiac output	
	14	15-Oct	Frank-Starling relationship	
			Cardiac preload	
			Cardiac afterload	
			Law of Laplace	
			Cardiac and vascular function curves	
			Altering cardiac and vascular function curves	
			Pressure volume loops	
			Changes in pressure-volume loops	
			Cardiac work	
			15	
	Cardiovascular changes during exercise			
	Cardiovascular changes during hemorrhage			
	Cardiovascular changes during postural change			
	Special circulations			
Coronary circulation				
Control of blood flow circulation				
Microcirculation and Starling forces				
Thermoregulation				
		Cardiovascular temperature homeostasis		
16	22-Oct	Midterm Exam		
9	17	<b>Respiratory system anatomy and physiology</b>		
		Respiratory anatomy and physiology		
		Breathing mechanics		
		Lung volumes and capacities		
		Anatomy and physiologic dead space		
		Ventilation		
		Alveolar gas equation		
	18	29-Oct	Compliance of lungs and chest wall	
			Combined lung and chest pressure-volume curves	
			Alveolar surface tension and surfactant	
			Airflow, pressure, and resistance	
			Breathing cycle	
			Breathing regulation and control	
			Pulmonary receptors and mechanoreceptors	
Gas exchange				
Ideal (general) gas law, Boyle's law, Dalton's law, Henry's law, Graham's law, Fick's laws of diffusion				
Gas exchange in the lungs				
Diffusion-limited and perfusion-limited gas exchange				

10	19	3- Nov	Gas transport	Draft Report (13- Nov)		
			Oxygen binding capacity and oxygen content			
			Oxygen-hemoglobin dissociation curve			
			Erythropoietin			
			Carbon dioxide transport in blood			
	20	5- Nov	Regulation of pulmonary blood flow			
			Zones of pulmonary blood flow			
			Pulmonary shunts			
			Ventilation perfusion ratios and V Q mismatch			
			Hypoxemia and hypoxia			
			Normal variations of the respiratory system			
			Pulmonary changes during exercise			
			Pulmonary changes at high altitude and altitude sickness			
	11	21	10- Nov		<b>Renal system anatomy and physiology</b>	Draft Report Reviews (13-Nov)
Fluids in the body						
Renal clearance						
Renal blood flow regulation						
Renal blood flow regulation						
Measuring renal plasma flow and renal blood flow						
22		12- Nov	Renal electrolyte regulation			
			Glomerular filtration			
			Proximal convoluted tubule			
			Loop of Henle			
			Distal convoluted tubule			
			TF/Px ratio and TF/P inulin			
			Renin-angiotensin aldosterone system			
			Phosphate, calcium, and magnesium homeostasis			
12	23	17- Nov	Renal absorption and secretion			
			Tubular reabsorption and secretion			
			Tubular reabsorption of glucose			
			Tubular secretion of PAH			
			Urea recycling			
			Weak acids and bases - non-ionic diffusion			
			Water regulation			
			Osmoregulation			
			Kidney countercurrent multiplication			
			Antidiuretic hormone			
			Free water clearance			
			24			<b>Acid-base physiology</b>

		19-Nov	Acid-base map and compensatory mechanisms Buffering and Henderson-Hasselbalch equation Physiologic pH and buffers The role of the kidney in acid-base balance Plasma anion gap	Draft Report Reviews Back Evals (20-Nov)
13	25	24-Nov	<b>Gastrointestinal system anatomy and physiology</b> Gastrointestinal function Enteric nervous system Gastrointestinal hormones Satiety Upper gastrointestinal tract Chewing and swallowing Salivary secretion Enteric nervous system and slow waves Esophageal motility Gastric motility Gastric secretions	Final Report (24-Nov)
		26-Nov	Thanksgiving Holiday	
14	26	1-Dec	Digestion and absorption Hydration Digestion of carbohydrates and sugars Digestion of proteins Digestion of fats and lipids Vitamins Intestinal fluid balance Prebiotics and probiotics Liver, gall bladder, and pancreas Bile secretion and enterohepatic circulation Liver anatomy and physiology Pancreatic secretion	
	27	3-Dec	<b>Reproductive physiology</b> Anatomy and physiology of the female reproductive system Estrogen and progesterone Oxytocin and prolactin Menstrual cycle Pregnancy	Final Report Reviews (4-Dec)
15	28	8-Dec	Male reproductive system Anatomy and physiology of the male reproductive system Testosterone <b>Immune system anatomy and physiology</b> Introduction to the immune system	Final Report Reviews Back-Evals (9-Dec)

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			Vaccines	
		10-Dec	Reading Day	
		16-Dec	FINAL EXAM (Wednesday, Dec 16: Final Exam: 12:30 PM - 2:30 PM Online)	