

**BIOLOGY 340: MAMMALIAN PHYSIOLOGY LAB****LAB****COORDINATOR:** John Yarotsky, PhD**PHONE:** 973-642-7976**OFFICE:** CKB 340C**EMAIL:** yarotsky@njit.edu**TEACHING**Subash Kusum Ray: [sr523@njit.edu](mailto:sr523@njit.edu)Smita More-Potdar: [sm2573@njit.edu](mailto:sm2573@njit.edu)**ASSISTANTS:**

Amani Webber-Schultz:

[amaniwebberschultz@gmail.com](mailto:amaniwebberschultz@gmail.com)**DESCRIPTION:**

In this course we will examine basic concepts of mammalian physiology and approach it from a "hands on" perspective. The laboratory exercises will cover major organ systems with an emphasis on human anatomy and physiology. The schedule will parallel the topics covered in the lecture in order to reinforce the concepts covered in each organ system.

**GOALS:**

This course will review general principles of the function of the human body as a mammal, with emphasis on the function and regulation of neuromuscular, cardiovascular, respiratory, endocrine, digestive, and excretory systems. The goal is to provide students with the basic knowledge to understand how their own bodies operate.

**PREREQUISITES:**

Foundations of Biology (R120: 201, 202)

**TEXTBOOKS:**

Lab Materials: PhysioEx is a software that will be used for the virtual Lab Exercises. Access can be purchased on this page:

[https://media.pearsoncmg.com/bc/bc\\_0media\\_ap/physioex//10/login/sign-in.php?dest=https://media.pearsoncmg.com/bc/bc\\_0media\\_ap/physioex/10/index.php](https://media.pearsoncmg.com/bc/bc_0media_ap/physioex//10/login/sign-in.php?dest=https://media.pearsoncmg.com/bc/bc_0media_ap/physioex/10/index.php)

**BIOLOGY 340: MAMMALIAN PHYSIOLOGY LAB**

	Monday	Tuesday	Wednesday	Thursday	Friday
8:00 am					
9:00 am					
10:00 am			002 Amani		012
11:00 am		008 Amani			
12:00 pm			004		
1:00 pm			Subash		
2:00 pm					006
3:00 pm					
4:00 pm		010 Subash			
5:00 pm					
6:00 pm		104 Smita	102 Smita		

WEEK	DATES	TOPICS
Week 1	Jan 18-20	No Labs
Week 2	Jan 24-28	No in lab activities. Labs will be virtual on Webex
Week 3	Jan 31 Feb 4	No in lab activities. Labs will be virtual on Webex
Week 4	Feb 7-11	Lab Manual: Exercise 14: Skeletal Muscle Physiology- Activities 1 & 3
Week 5	Feb 14-18	Lab Manual: Exercise 21: Human Reflex Physiology-Activities- 1,2,3,6,7
Week 6	Feb 21-25	Lab Manual: Exercise 29: Blood-Activities- 2,3,4,6,7
Week 7	Feb 28 Mar 4	Lab Exam 1
Week 8	Mar 7-11	Lab Manual: Exercise 30: Anatomy of the Heart-Activities 1-4
Week 9	Mar 14-18	Spring Break- No Labs
Week 10	Mar 21-24	Lab Manual: Exercise 33: Human Cardiovascular Physiology BP and Pulse-Activities-1,2,5,6,7,8
Week 11	Mar 28 Apr 1	Lab Manual: Exercise 38: Anatomy of the Digestive System
Week 12	Apr 4-8	Lab Manual: Exercise 27: Endocrine Glands-Activities 1&2
Week 13	Apr 11-15	Good Friday-No Labs
Week 14	Apr 18-22	Lab Manual: Exercise 40: Anatomy of the Urinary System-Activities 1&2
Week 15	Apr 25-29	Lab Exam 2
Important Semester Dates		<ul style="list-style-type: none"> <li>▪ March 14-18 Spring Break</li> <li>▪ April 15 (F): Good Friday – University Closed.</li> <li>▪ May 3 (T): Last Day of Classes.</li> </ul>
FINALS		FINAL EXAM WEEK: MAY 6-12



**BIOLOGY 340: MAMMALIAN PHYSIOLOGY LAB****Date****Week of 1/24: PhysioEx online lab: Exercise 3: Neurophysiology of Nerve Impulses**

- [Activity 1: The Resting Membrane Potential \(opens new window\)](#)
- [Activity 2: Receptor Potential \(opens new window\)](#)
- [Activity 3: The Action Potential: Threshold \(opens new window\)](#)
- [Activity 4: The Action Potential: Importance of Voltage-Gated Na<sup>+</sup> Channels](#)

**Week of 1/31 PhysioEx online lab: Exercise 3: Neurophysiology of Nerve Impulses**

- [Activity 5: The Action Potential: Measuring Its Absolute and Relative Refractory Periods \(opens new window\)](#)
- [Activity 6: The Action Potential: Coding for Stimulus Intensity \(opens new window\)](#)
- [Activity 7: The Action Potential: Conduction Velocity \(opens new window\)](#)
- [Activity 8: Chemical Synaptic Transmission and Neurotransmitter Release \(opens new window\)](#)
- [Activity 9: The Action Potential: Putting It All Together](#)

**Week of 2/7 PhysioEx online lab: Exercise 2: Skeletal Muscle Physiology**

- [Activity 1: The Muscle Twitch and the Latent Period \(opens new window\)](#)
- [Activity 2: the Effect of Stimulus Voltage on Skeletal Muscle Contraction \(opens new window\)](#)
- [Activity 3: The Effect of Stimulus Frequency on Skeletal Muscle Contraction \(opens new window\)](#)
- [Activity 4: Tetanus in Isolated Skeletal Muscle \(opens new window\)](#)
- [Activity 5: Fatigue in Isolated Skeletal Muscle \(opens new window\)](#)
- [Activity 6: The Skeletal Muscle Length-Tension Relationship \(opens new window\)](#)
- [Activity 7: Isotonic Contractions and the Load-Velocity Relationship](#)

**Week of 2/14 No PhysioEx activity****Week of 2/21 PhysioEx online lab: Exercise 11 Exercise 11: Blood Analysis**

- [Activity 1: Hematocrit Determination \(opens new window\)](#)
- [Activity 2: Erythrocyte Sedimentation Rate \(opens new window\)](#)
- [Activity 3: Hemoglobin Determination \(opens new window\)](#)
- [Activity 4: Blood Typing](#)

**Week of 2/28 Lab Exam I:**

**Week of 3/7 PhysioEx online activity: Exercise 6: Cardiovascular Physiology**

- [Activity 1: Investigating the Refractory Period of Cardiac Muscle \(opens new window\)](#)
- [Activity 2: Examining the Effect of Vagus Nerve Stimulation \(opens new window\)](#)
- [Activity 3: Examining the Effect of Temperature on Heart Rate \(opens new window\)](#)
- [Activity 4: Examining the Effects of Chemical Modifiers on Heart Rate](#)

**Week of 3/14- Spring Break- No Labs**

**Week of 3/21 No PhysioEx activity**

**Week of 3/28 PhysioEx online activity: Exercise 8: Chemical and Physical Processes of Digestion**

- [Activity 1: Assessing Starch Digestion by Salivary Amylase \(opens new window\)](#)
- [Activity 2: Exploring Amylase Substrate Specificity \(opens new window\)](#)
- [Activity 3: Assessing Pepsin Digestion of Protein \(opens new window\)](#)
- [Activity 4: Assessing Lipase Digestion of Fat](#)

**Week of 4/4 PhysioEx online activity: Exercise 4: Endocrine System Physiology**

- [Activity 1: Metabolism and Thyroid Hormone \(opens new window\)](#)
- [Activity 2: Plasma Glucose, Insulin, and Diabetes Mellitus \(opens new window\)](#)
- [Activity 3: Hormone Replacement Therapy \(opens new window\)](#)
- [Activity 4: Measuring Cortisol and Adrenocorticotrophic Hormone](#)

**Week of 4/11- Good Friday- No Labs**

**Week of 4/18 PhysioEx online activity: Exercise 9: Renal Physiology**

- [Activity 1: The Effect of Arteriole Radius on Glomerular Filtration \(opens new window\)](#)
- [Activity 2: The Effect of Pressure on Glomerular Filtration \(opens new window\)](#)
- [Activity 3: Renal Response to Altered Blood Pressure \(opens new window\)](#)
- [Activity 4: Solute Gradients and Their Impact on Urine Concentration \(opens new window\)](#)
- [Activity 5: Reabsorption of Glucose via Carrier Proteins \(opens new window\)](#)
- [Activity 6: The Effect of Hormones on Urine Formation](#)

**Week of 4/25 Exam 2**

**ATTENDANCE POLICY:** The first two weeks of lab activities will take place via Webex. A link for your lab section will be provided in the "General" module on the Canvas page. Those labs will take place during the normally scheduled time. You must log in and attend these sections. You must have a laptop with a working Webcam and microphone. Your webcam must be turned on in order for your attendance to be counted. After the first two

weeks of labs, February 7, labs will return to in person and will be held in person only. You must then attend the lab sections in person and are not permitted to attend virtually. Laboratory attendance is **MANDATORY**. **If you miss two lab classes, you FAIL the course.** Attendance is also required to do well in the lecture section of the course. Attendance (sign-in sheets) is taken in every lab class.

**Grading Policy:**

*Midterm and Final Exam – 40% each (Total = 80%) Attendance/quizzes = 20% = 100%*

**Lab exams** - Both exams are practical with stations. We will discuss more in detail later in the semester.

**Makeup Exams:** Laboratory exams **CANNOT** be made-up. These are practical exams which take time to prepare. We cannot setup the entire exam for an individual student, or even for a small number of students. Therefore, if you miss a scheduled lab exam, you will receive a grade of zero. **Make up exams must be approved by the Dean of Student Affairs. If you miss an exam, do not contact your Lecturer or TA. Contact the Office of the Dean of Student Affairs in order to arrange a meeting where you must provide proper documentation of the reason for your absence.**

If attendance becomes a problem, the lecture and lab instructor will begin to administer impromptu quizzes that will later be calculated into the Lecture exam grades, valuing at 10% of total semester grade.

**HONOR CODE:**

This course will strictly adhere to the [NJIT Honor Code](#)!! Both the lecture and the lab will have zero tolerance for violations to the NJIT's [University Code on Academic Integrity](#)!!

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**This is a reading intensive course! Due the volume of material that is to be covered, students are expected to know topics in the text book that could not be covered during lectures. ◀ READ CHAPTERS BEFORE CLASS! ▶**

