

**College of Public Health and Health Professions  
Department of Physical Therapy  
Syllabus**

**PHT 6168: *Neuroscience for Physical Therapists* (4 credit hours)  
Spring Semester, 2014**

Lecture: Mon: 9:35-10:25, Wed 8:30-9:20, Fri: 8:00-8:50, HPNP room 1104

Laboratory Lecture: Fri: 9:00-9:30, HPNP room 1104

Laboratory: Friday, (A) 9:30-11:30, (B) 1:00-3:00

For some laboratory sessions, laboratory groups A and B will meet together from 9:30-11:30,  
otherwise groups A and B rotate the early and late sessions on a weekly basis

\*the lab will meet in HPNP 1104 for the first part of the semester and in CG 22 for labs with "wet specimens"

### **Instructor**

Heather Ross, MPT, PhD  
Course Coordinator

Email: [hhrunc@phhp.ufl.edu](mailto:hhrunc@phhp.ufl.edu)  
Phone: 273-8965  
Office: BMS J398

### **Teaching Assistants**

Sharareh Sharififar, PT  
Lab and Lecture

Email: [sharareh75@phhp.ufl.edu](mailto:sharareh75@phhp.ufl.edu)

Jay Nair, PT  
Lab and Lecture

Email: [jay19oct@phhp.ufl.edu](mailto:jay19oct@phhp.ufl.edu)

### **Course Purpose**

The purpose of this course is for students to learn the fundamentals of how the human nervous system is constructed (*i.e.* neuroanatomy) and how it works (*i.e.* neurophysiology). The course is structured to help students to gain a basic understanding of neuroscience and its relationship to the practice of physical therapy. Examples of applied neuroscience and clinical correlates will be utilized throughout the course to illustrate the relationship between "basic neuroscience" and the clinic. The course has two main components:

1. **Lectures** will provide an overview of the human nervous system. In general, the lectures will follow textbook chapters. Handouts will be provided as study material for indicated lectures. Please see the end of the syllabus for a detailed list of lecture topics.
2. During **structured laboratory sessions**, students will examine brain models and wet specimens of the human brain and spinal cord. Additional laboratory exercises will address clinical aspects of human neuroscience. Please see the end of the syllabus for a list of laboratory topics. Other **independent laboratory sessions** will be scheduled to allow extra study time with models, specimens. Laboratory sessions will be preceded by a **laboratory lecture** to reinforce laboratory activities or to provide bridge material between formal lecture and laboratory.

## Course Objectives

Upon successful completion of this course, students should be able to:

1. Describe the structure and function of the nervous system using words and diagrams
2. Apply the principles of neuroscience to the understanding of pathophysiology.
3. Use neuroscience terminology appropriately to communicate with colleagues and patients.
4. When emphasized, determine a differential diagnosis from (neural) clinical symptoms.
5. Discuss principles of neuroplasticity and its emerging relevance to current and future clinical practice.
6. Participate in class and laboratory discussion in order to facilitate peer- and team-based teaching objectives.
7. Demonstrate respect for laboratory specimens.
8. Carry out Standard Operating Procedure for the handling of brain specimens and sections in order to facilitate both specimen maintenance and learning.

## Teaching Methods

This course has a lecture and laboratory component. For the lecture portion, powerpoint presentations will be supplemented with videos and team learning activities, with some group presentations. Real cases will be presented to provide the opportunity for you to develop effective clinical problem solving and decision-making skills when working with individuals with neurologic problems. For the laboratory portion, powerpoint introductory material will supplement hands on demonstration and investigation of models and brain specimens.

## Course Prerequisites

Course participation is limited to entry-level DPT students who have successfully completed their first semester of study.

## Course Materials

1. *Neuroscience Fundamentals for Rehabilitation*. Laurie Lundy-Ekman. 4<sup>th</sup> Edition. Available in the bookstore. ISBN 9781455706433. Pub Date: 2012 required text
2. *Netter's Atlas of Neuroscience*. David L. Felten, Anil N. Shetty. F. Netter, M.D. (Illustrator). 2<sup>nd</sup> Edition. Saunders Elsevier. Pub Date: 2010 required text
3. *An Atlas of Structures, Sections and Systems*. Duane E Haines. 7<sup>th</sup> Edition. Available in the bookstore. ISBN 9780781763288. Pub Date: 2008 optional text
4. Supplemental Materials will be provided online, TBA

## Topical Outline

A detailed outline of the course is provided on the final page of this syllabus.

## Academic Honesty / Honor Code

In this professional program we are particularly sensitive to students submitting independent work and to using complete and accurate referencing in complying with the University of Florida Rules - 6CI-4.017 Student Affairs: Academic Honesty Guidelines. Further details regarding the University of Florida honesty policy is available at: <http://www.dso.ufl.edu/judicial/procedures/academicguide.php> and in your student handbook.

All students are required to abide by the Academic Honesty Guidelines, and the following pledge has been accepted by the University and is expected of all students: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity". 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."

## Policy Related to Class Attendance

Attendance is mandatory. Please contact the instructors as soon as possible if you are unable to attend class for any reason. Personal issues with respect to class attendance or fulfillment of course requirements will be handled on an individual basis.

## Policy Related to Make-up Exams

In extraordinary circumstances it may be possible to take an exam early or late. Please consult with the instructor if necessary. If for any reason you are unable to attend an exam at the last minute, you must notify the instructors as soon as possible. Personal issues with respect to class attendance or fulfillment of course requirements will be handled on an individual basis.

## Accommodations for students with disabilities

If you require classroom accommodation because of a disability, you must first register with the Dean of Students Office (<http://oss.ufl.edu/>). The Dean of Students Office will provide documentation to you, which you then give to the instructor when requesting accommodation. The College is committed to providing reasonable accommodations to assist students in their coursework.

## Counseling and Student Health

Students may occasionally have personal issues that arise in the course of pursuing higher education or that may interfere with their academic performance. If you find yourself facing problems affecting your coursework, you are encouraged to talk with an instructor and to seek confidential assistance at the University of Florida Counseling Center, 352-392-1575, or Student Mental Health Services, 352-392-1171. Visit their web sites for more information: <http://www.counsel.ufl.edu/> or <http://www.health.ufl.edu/shcc/smhs/index.htm#urgent>

The Student Health Care Center at Shands is a satellite clinic of the main Student Health Care Center located on Fletcher Drive on campus. Student Health at Shands offers a variety of clinical services, including primary care, women's health care, immunizations, mental health care, and pharmacy services. The clinic is located on the second floor of the Dental Tower in the Health Science Center. For more information, contact the clinic at 392-0627 or check out the web site at: [www.health.ufl.edu/shcc](http://www.health.ufl.edu/shcc)

Crisis intervention is always available 24/7 from: Alachua County Crisis Center: (352) 264-6789. *Do not wait until you reach a crisis to come in and talk with us. We have helped many students through stressful situations impacting their academic performance. You are not alone so do not be afraid to ask for assistance.*

## Office hours

There will be no specific office hours *per se*. Please feel free to email specific questions. You may also call or email to set up an appointment. In addition, feel free to drop by our offices without an appointment. However, we each have many other responsibilities, so we encourage you to make an appointment if you have many questions. In general, please first contact the TAs with laboratory questions, and the instructors with lecture questions.

## Website

We will use the UF "Sakai" System accessed at <https://lss.at.ufl.edu/> . Please check the website prior to attending class/lab.

## Professional Behavior

Professional behavior is critical for a successful transition from the classroom to the clinical setting. The faculty recognizes the importance of this by incorporating the development and evaluation of professional behavior into each academic course. Professional Behavior is described in the Student Handbook and is exemplified by:

1. attendance to all classes and labs,
2. timeliness,
3. attentiveness,
4. respectful and polite interaction with peers, instructors, and patients,
5. active learning as demonstrated by questions and discussion,
6. active participation in lab activities,
7. responsibility shown for maintenance, organization, and cleanliness of lab equipment and facilities,
8. leads and/or contributes to lab preparation and clean-up, as requested.
9. and others as described on Professional Behaviors and Student Responsibilities in the Student manual.

## Laptop & Smartphone policy

Laptop computers are permitted for taking notes. However, internet use of any kind is not permitted during lectures. Likewise, smartphones and other technology (e.g., iPads, Kindles, etc.) are permitted in the classroom but their use during class time is not permitted.

## Social Media policy

Materials are not to be posted or discussed on social media.

## Dress Code

Please review the policies for lecture attire in your Student Handbook. For lab sessions, scrubs or lab coat are needed if we are handling wet tissue specimens.

## General Laboratory Safety

1. The fixatives used for the brain and spinal cord can be hazardous. Always wear gloves when handling specimens. Wet specimens should be removed from the storage buckets and placed on metal trays. If fixative spills onto the table, clean it up quickly. Do not bring food into the lab. Wash your hands thoroughly with soap and water after cleaning up the lab. If you are pregnant or have respiratory problems please wear a surgical mask.
2. Only students are permitted in the lab (no guests, children, pets *etc.*)
3. Biological materials and gloves must be properly disposed of in biohazard bags.
4. Do not use scalpels or any sharp instrument when looking at specimens. This is not a dissection lab. Use only blunt instruments when looking at specimens.
5. Know the location of the first-aid kit.

## Student Responsibilities for Safety and Learning for Clinical Labs

Students will be expected to practice neurologic exam skills on their classmates, instructors, or other simulated patients. They will also serve as patients for their classmates and instructors. Students are responsible for providing their lab partners and instructors with necessary feedback and information in order to prevent injury, or when a student has a condition that prevents participation. Students are also responsible for notifying the instructor of behaviors, circumstances, or conditions that hinder student learning. Students will be expected to practice with multiple laboratory partners and may be assigned a partner by a course instructor for specific activities.

## Class Activities and procedures

**Exams.** Exams 1-3 are each worth 20% of your overall grade. The material is cumulative but the focus of the exams will be on the material associated with the relevant chapters. Exam 2 will cover 10% of Exam 1 material. Exam 3 will cover 5% of Exam 1 and 5% of Exam 2 material.

**Quizzes.** There will be nine quizzes as listed on the schedule. The lowest quiz score will be dropped and the remaining eight quizzes will comprise 10% of your overall course grade. The quizzes will be comprised of five questions.

**Laboratory Exams.** There will be one laboratory exam that is worth 30% of your overall grade. The details of this exam will be discussed in class.

**Extra Credit:** Some clinical material presented in this text will not be taught in formal lecture. The goal is to spend ample lecture time on basic and applied neuroanatomy and neurophysiology, as clinical material will be covered in more depth later in the curriculum. For the introductory clinical information in question, extra credit assignments will be offered to the student. The format and timing of these assignments will be announced in class at the discretion of the instructors.

**Please Note:** We reserve the right to utilize the Power Point-based clicker quizzing system for some aspects of quizzes, in-lecture review questions, and possibly examinations.

## Exams and scoring

This course will be graded according to the departmental guidelines located in the student handbook. We will follow the standard grading scale listed below. However, we reserve the right to apply a "curve" if this is merited by the distribution of grades. Nevertheless, a grade of 93% will guarantee an "A". Lecture material will be covered during three in-class exams. Lecture exams will include multiple choice, short answer, fill-in-the-blank, diagrams, and labeling neuroanatomical tracts. Two laboratory exams will test neuroanatomy knowledge. However, neuroanatomy will also appear (to a lesser extent) on the lecture exams.

### Summary of grading

Lecture exam 1:	20%
Lecture exam 2:	20%
Lecture exam 3:	20%
Lab exam 1:	15%
Lab exam 2:	15%
Quizzes:	10%

93-100 =	A 4.00 grade point
90-92 =	A- 3.67 grade point
87-89 =	B+ 3.33 grade point
83-86 =	B 3.00 grade point
80-82 =	B- 2.67 grade point
70-79 =	C 2.00 grade point
60-69 =	D 1.00 grade point
Below 60 =	E 0 grade point

## Specific learning objectives

Each lecture will be accompanied by specific learning objectives. These objectives are provided to help you focus your studying. While the exams may cover material not specifically addressed in the learning objectives, the majority of the exam questions will derive from these objectives.

## How should I study for this course?

1. **Read the assignments prior to class.** Your ability to learn and retain the information will directly correlate with your preparation for class.
2. **Review the learning objectives for each lecture.** These will direct your attention to the material's broad themes and topical organization.
3. **Answer review questions and review case studies at the end of each chapter.** These will help to synthesize and apply the covered material.
4. **Make drawings and/or outlines.** These drawings/outlines will help you organize your notes and integrate knowledge from both the lectures and labs.

*The schedule, policies, and assignments described in this syllabus are subject to change in the event of extenuating circumstances or by mutual agreement between the instructor, and the students.*

Weekday	Date	Activity	Lecture / Lab topic	Exams / Quizzes	Reading assignment	Instructor
Monday	6-Jan	Lecture	Introduction to Neuroscience		Chapter 1	Ross
Wednesday	8-Jan	Lecture	Introduction to Neuroscience		Chapter 1	Ross
Friday	10-Jan	Lecture	Blood Supply and CFS I		Chapter 19	Ross
Friday	10-Jan	LABlec	Introduction to Neuroanatomy Lab		Netter Lab Manual	Ross
Friday	10-Jan	LAB	Lab: Surface Anatomy-Models - Rm 1104			All
Monday	13-Jan	Lecture	Blood Supply and CFS II		Chapter 19	Ross
Wednesday	15-Jan	Lecture	Development of the Nervous System I	Quiz	Chapter 5	Ross
Friday	17-Jan	Lecture	Development of the Nervous System II		Chapter 5	Senesec
Friday	17-Jan	LABlec	TBA			Ross
Friday	17-Jan	LAB	Lab - Surface Anatomy - Models		Netter Lab Manual	All
Monday	20-Jan	MLK DAY	NO CLASS			
Wednesday	22-Jan	Lecture	Neuroplasticity I: Stem Cells		Handouts/Chapters 1 & 2	Ross
Friday	24-Jan	Lecture	Somatosensory System I		Chapter 6	Ross
Friday	24-Jan	LABlec	TBA			Shariffar
Friday	24-Jan	LAB	Lab: Internal Structures - Models - Rm 1104		Netter Lab Manual	All
Monday	27-Jan	Lecture	Somatosensory System II	Quiz	Chapter 6	Ross
Wednesday	29-Jan	Lecture	Somatosensation: Applied Neuroscience		Chapter 7-8	Ross
Friday	31-Jan	Lecture	Somatosensation: Clinical Applications		Chapter 7-8	Ross
Friday	31-Jan	LABlec	TBA			Nair
Friday	31-Jan	LAB	Lab - All structures - Room 1104		Netter Lab Manual	All
Monday	3-Feb	Lecture	Autonomic Nervous System I	Quiz	Chapter 9	Ross
Wednesday	5-Feb	Lecture	Autonomic Nervous System II		Chapter 9	Ross
Friday	7-Feb	Lecture	Carry over, exam review			Ross
Friday	7-Feb	LABlec	TBA			Ross
Friday	7-Feb	LAB	Wet Lab: Surface Anatomy - Rm CG22		Netter Lab Manual	All
Monday	10-Feb	Exam	EXAM 1	Exam chapters	Ch 1, 5-9, 19, stem cells	Ross
Wednesday	12-Feb	Lecture	Motor systems I		Chapter 10	Ross
Friday	14-Feb	Lecture	Motor systems II		Chapter 10	Ross
Friday	14-Feb	LABlec	TBA			Shariffar
Friday	14-Feb	Lecture	Wet Lab: Surface Anatomy - Rm CG22		Netter Lab Manual	All
Monday	17-Feb	Lecture	Motor systems III (applied and clinical)	Quiz	Chapter 10	Ross
Wednesday	19-Feb	Lecture	Basal Ganglia I		Ch 11 + Supplemental	Ross
Friday	21-Feb	Lecture	Basal Ganglia II		Ch 11 + Supplemental	Ross
Friday	21-Feb	LABlec	TBA			Nair
Friday	21-Feb	LAB	Wet Lab: Coronal Slices - Rm CG22		Netter Lab Manual	All
Monday	24-Feb	Lecture	Cerebellum I	Quiz	Ch 11 + Supplemental	Ross
Wednesday	26-Feb	Lecture	Cerebellum II		Ch 11 + Supplemental	Ross
Friday	28-Feb	Lecture	Peripheral Nervous System: I		Chapter 12	Shariffar
Friday	28-Feb	Lecture	Peripheral Nervous System: II		Chapter 12	Shariffar
MON-FRI	3-Mar	8-Mar	SPRING BREAK			
Monday	10-Mar	Lecture	Spinal I		Chapter 13	Nair
Wednesday	12-Mar	Lecture	Spinal II		Chapter 13	Nair
Friday	14-Mar	9:00-12:00	NMP Symposium - Required	Location TBA		
Monday	17-Mar	Lecture	Cranial Nerves I	Quiz	Chapter 14	Ross
Wednesday	19-Mar	Lecture	Cranial Nerves I		Chapter 14	Ross
Friday	21-Mar	Lecture	Cranial Nerves III		Chapter 14	Thigpen
Friday	21-Mar	LABlec	TBA			Ross
Friday	21-Mar	LAB	Wet Lab: Horizontal Slices-CG22		Netter Lab Manual	All
Monday	24-Mar	Exam	EXAM 2	Exam chapters	Chapters 10-14	Ross
Wednesday	26-Mar	Lecture	Spinal: Applied Neuroscience		Handouts	Fox
Friday	28-Mar	Lecture	Brainstem I		Chapter 15	Ross
Friday	28-Mar	LABlec	TBA			Shariffar
Friday	28-Mar	LAB	Wet Lab: All Slices-CG22		Netter Lab Manual	All
Monday	31-Mar	Lecture	Brainstem II	Quiz	Chapter 15	Ross
Wednesday	2-Apr	Lecture	Cerebrum I		Chapter 17	Ross
Friday	4-Apr	Lecture	Cerebrum II		Chapter 17	Ross
Friday	4-Apr	LABlec	TBA			Nair
Friday	4-Apr	LAB	Wet Lab: All structures - CG22		Netter Lab Manual	All
Monday	7-Apr	Lecture	Neuroplasticity II: Cortical Plasticity	Quiz	Chapter 18	Corti
Wednesday	9-Apr	Lecture	Neuroplasticity III: Cellular Mechanisms		as directed	Ross
Friday	11-Apr	Lecture	Review of Cellular Properties		as directed	Ross
Friday	11-Apr	LABlec	TBA			Ross
Friday	11-Apr	LAB	Wet Lab: All structures - CG22		Netter Lab Manual	All
Monday	14-Apr	Lecture	Neuroplasticity IV: Regenerative Rehabilitation	Quiz	Handouts	Ross
Wednesday	16-Apr	Lecture	Topics in Applied Neuroscience		Handouts, interactive	Ross

Friday	18-Apr	Lecture	Vestibular and Vision I		Chapter 16	TBA
Friday	18-Apr	LAB EXAM	LAB EXAM		Models & Wet Lab	All
Monday	21-Apr	Lecture	Vestibular and Vision II		Chapter 16	TBA
Wednesday	23-Apr	Lecture	Vestibular and Vision III		Chapter 16	TBA
	TBA		EXAM 3		Chapters 15-18, handouts	Ross