

**University of Nevada, Las Vegas  
School of Allied Health Sciences  
Department of Physical Therapy**

<b><u>Course Number:</u></b>	DPT 756
<b><u>Course Title:</u></b>	Neurophysiology
<b><u>Credit Hours:</u></b>	4
<b><u>Lecture Hours:</u></b>	4 hours/week
<b><u>Weekly Schedule:</u></b>	Mondays and Wednesdays - 7:30 am to 9:20 am
<b><u>Location:</u></b>	BHS 213
<b><u>Instructor(s):</u></b>	Merrill Landers, PT, DPT, PhD, OCS Office hours: Tuesdays, 9:30am to 11:30am Telephone: 702-895-1377 Email: <a href="mailto:merrill.landiers@unlv.edu">merrill.landiers@unlv.edu</a>
<b><u>Graduate Assistant(s):</u></b>	Javier Ibarra, SPT

**Introduction and Course Description:**

High level immersion into the function of the human central and peripheral nervous systems based on current research and theory. Topics will include normal human motor and sensory neurophysiology, cognitive and learning neurophysiology, neuropathophysiology, neuroplasticity, neurodiagnostics and neurologic treatment options.

**Course Objectives:**

The following objectives are aligned with curriculum content from the Commission on Accreditation in Physical Therapy Education (Evaluative Criteria of PT Programs-updated 11/2012), the APTA Minimum Required Skills of Physical Therapist Graduates at Entry-Level core document content (updated 10/1/27013), and the Normative Model of Physical Therapist Professional Education: Version 2004.

Additionally, this course has been designed to be consistent with the following guidelines and recommendations:

- APTA Neurology Section: Neurologic Entry-Level Curricular Content Integrated with a Normative Model of Physical Therapist Professional Education
- APTA Section on Geriatrics: Essential Competencies in the Care of Older Adults at the Completion of the Entry-Level Physical Therapist Professional Program of Study

**At the completion of the course the student will be able to:**

1. Detail neurobiological principles underlying the functioning of the nervous system.
2. Describe the relationships of genetics and environment on nervous system function, development and plasticity.
3. Discuss sensory, motor, and associative functioning of the nervous system.
4. Explain the neuroscience of pain, headache, placebo and nocebo.
5. Describe the neuroscience of neuroprotection and neuroplasticity of the nervous system.
6. Explain the neurobiology of exercise.
7. Detail the role of the nervous system in the function of locomotion and balance.
8. Discuss the neurobiology of extra-pyramidal motor control.
9. Describe the neuropathology of the most common neurologic pathologies (e.g., Parkinson's disease and other movement disorders, Alzheimer's disease, cerebrovascular disease, and multiple sclerosis).
10. Critically evaluate the neuroscience research literature related to physical therapy practice.

**Course Structure:**

The major component of the course will be a series of lectures. Students will gain an understanding of the effects of electrical and chemical neurotransmission on plasticity and recovery of function. Students will also gain an understanding of the neurophysiological impact on reflexes, sensation, and movement. Presentations and discussions will be conducted concerning the most current research on selected topics. This course has been designed in accordance with the Normative Model of Physical Therapist Professional Education: Version 2004 (APTA) and also with the APTA Neurology Section's Neurologic Entry-Level Curricular Content (still in draft form; <http://www.neuropt.org/go/news/guidelines-for-neurologic-content-in-entry-level-dpt-curricula>)

**Evaluation Methods:****1. Testing****Written Exams**

- a. There will be 3 exams and a final comprehensive examination
- b. All tests will be comprehensive over the most recent material presented since the last exam
- c. Each student is expected to take all of the exams
- d. If any student does not or is unable to take an exam or do the presentation due to an emergency, then plans must be made at the discretion of the professor to complete all coursework within a specified time period
- e. Extra credit: There may be extra credit questions throughout the semester from the previous lectures or readings that will count up to 2% of the total points on each of the tests.

**2. Grading**

The final course grade is a letter grade. The course grade will be based on the following:

Exams	=300 (3x100)
Comprehensive Final	<u>=200</u>
	500 total points

**Numeric and letter grade translation (no rounding!)**

A	93-100	B-	80-82
A-	90-92	C+	77-79
B+	87-89	C	73-76
B	83-86	F	<73

**Instructional Practices:**

**1. Teaching Methods**

- a. Lecture
- b. Classroom discussion
- c. Interactive classroom assessment

**2. Teaching Aids**

- a. Powerpoint
- b. Video

**3. Student Responsibilities**

- a. Prepare for the lecture and discussion sessions by reading the required materials prior to the session
- b. Active participation in all sessions
- c. Have access during lecture to the lecture notes from WebCampus
- d. Any student having particular difficulty with material presented in this course should seek direction and/or assistance from the professor as soon as the difficulty is perceived
- e. Each student is expected to act according to the guidelines of Professional Abilities set forth in the Department of Physical Therapy Student Manual.

**4. Course Policies**

- a. For general Course Policies see the Department of Physical Therapy Student Manual.
- b. Academic Misconduct – Academic integrity is a legitimate concern for every member of the campus community; all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility and professionalism. By choosing to join the UNLV community, students accept the expectations of the Academic Misconduct Policy and are encouraged when faced with choices to always take the ethical path. Students enrolling in UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's function as an educational institution. An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another, from the Internet or any source, without proper citation of the sources. See the Student Academic Misconduct

Policy (approved December 9, 2005) located at:

<http://studentconduct.unlv.edu/misconduct/policy.html>.

- c. Copyright – The University requires all members of the University Community to familiarize themselves and to follow copyright and fair use requirements. You are individually and solely responsible for violations of copyright and fair use laws. The university will neither protect nor defend you nor assume any responsibility for employee or student violations of fair use laws. Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional information can be found at: <http://provost.unlv.edu/copyright/statements.html>.
- d. Disability Resource Center (DRC) – The UNLV Disability Resource Center (SSC-A 143, <http://drc.unlv.edu/>, 702-985-0866) provides resources for students with disabilities. If you feel that you have a disability, please make an appointment with a Disabilities Specialist at the DRC to discuss what options may be available to you. If you are registered with the UNLV Disability Resource Center, bring your Academic Accommodation Plan from the DRC to me during office hours so that we may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach me before or after class to discuss your accommodation needs.
- e. Religious Holidays Policy – Any student missing class quizzes, examinations, or any other class or lab work because of observance of religious holidays shall be given an opportunity during that semester to make up missed work. The make-up will apply to the religious holiday absence only. It shall be the responsibility of the student to notify the instructor no later than the end of the first two weeks of classes of his or her intention to participate in religious holidays which do not fall on state holidays or periods of class recess. This policy shall not apply in the event that administering the test or examination at an alternate time would impose an undue hardship on the instructor or the university that could not reasonably been avoided. For additional information, please visit: <http://catalog.unlv.edu/content.php?catoid=4&navoid=164>.
- f. Tutoring – The Academic Success Center (ASC) provides tutoring and academic assistance for all UNLV students taking UNLV courses. Students are encouraged to stop by the ASC to learn more about subjects offered, tutoring times and other academic resources. The ASC is located across from the Student Services Complex (SSC). Students may learn more about tutoring services by calling (702) 895-3177 or visiting the tutoring web site at: <http://academicsuccess.unlv.edu/tutoring/>.
- g. Rebelmail – By policy, faculty and staff should e-mail students' Rebelmail accounts only. Rebelmail is UNLV's official e-mail system for students. It is one of the primary ways students receive official university communication such as information about deadlines, major campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the university. Students' e-mail prefixes are listed on class rosters. The suffix is always @unlv.nevada.edu.
- h. Library Resources – Students may consult with a librarian ([www.library.unlv.edu/consultation](http://www.library.unlv.edu/consultation)) about research needs. For this class, the subject

librarian is Xan Goodman. UNLV Libraries provides resources to support students' access to information. Discovery, access, and use of information are vital skills for academic work and for successful post-college life. Access library resources and ask questions at [www.library.unlv.edu/](http://www.library.unlv.edu/)

**Required Texts:**

1. Kandel ER, Schwartz JH, Jessel TM, Siegelbaum SA, Hudspeth AJ. *Principles of Neural Science*. 5<sup>th</sup> Edition. McGraw-Hill: 2013. ISBN: 978-0-07-139011-8

**Recommended Reading:**

1. Schenkman ML, Bowman JP, Gisbert RL, Butler RB. *Clinical Neuroscience for Rehabilitation*. Pearson Education, Inc: 2013. ISBN: 978-0-13-302469-2

2. Jones HR. *Netter's Neurology*. ICON Learning Systems: 2005. ISBN: 1-929007-06-X