

PT 7212

## Introduction to Neuroscience Concepts



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### Instructor:

**Laura Wilson, PT, DPT, NCS**

**Email:** laura.wilson@angelo.edu

**Phone:** 325-486-6883

**Office:** HHS 244A

**Office Hours:** By appointment

## Course Information

### Course Description

Using a combination of lecture and lab activities, students will learn basic neurologic concepts necessary to interpret the results of neurologic testing. Students will learn the gross structures and functions of the central nervous system, the blood supply, and the motor and sensory systems and be able to apply the knowledge to cases to determine location of lesions. This course provides a foundation for later neuropathology courses.

### Course Credits

(1-3-0)

### Prerequisite Courses

Successful completion of previous DPT coursework is required.

### Prerequisite Skills

Understanding of basic neuroanatomy and the neuro exam presented in PT 7710 (Clinical Anatomy) and PT 7550 (Fundamentals of Physical Therapist Examination). Proficiency with a computer as required for completing assignments/tests/etc. is also required.

## Program Outcomes

Upon completion of the program of study for the Department of Physical Therapy, the graduate will be prepared to: successfully select and implement appropriate actions to safely and effectively manage the day-to-day tasks of a physical therapist utilizing current concepts for patient management.

## Student Learning Outcomes

<b>Student Learning Outcome</b> By completing all course requirements, students will be able to:	<b>Assignment(s) or activity(ies) validating outcome achievement:</b>
Identify the regions and structures of the nervous system on specimens, figures, and in cases. 7A, 7B	In-class assignments; exams
Identify the functions of the different regions and structures of the nervous system and the possible dysfunction as a result of lesions. 7A, 7C	In-class assignments; exams
Examine tissue from the central nervous to identify the gray matter (neurons) and the white matter (myelinated fibers of passage) in relation to the ventricles and blood supply.	In-class assignments; exams
Discuss the functions of the meningeal layers. 7A	In-class assignments; exams
Describe the formation, circulation, and absorption of the cerebrospinal fluid and the cause of hydrocephalus. 7A, 7C	In-class assignments; exams
Diagram the sensory and motor pathways of the nervous system. 7A	In-class assignments; exams
Describe the process of neural transmission from the peripheral receptors to the CNS in words and diagrams. 7A	In-class assignments; exams
Describe the process of neural transmission from the motor cortex to the muscles. 7A	In-class assignments; exams
Correlate the role of the major ascending and descending systems to clinical signs and symptoms. 7A	In-class assignments; exams
Describe the cellular components of the nervous system. 7A	In-class assignments; exams

<b>Student Learning Outcome</b> By completing all course requirements, students will be able to:	<b>Assignment(s) or activity(ies) validating outcome achievement:</b>
Describe the communication systems of the nervous system within the nervous system and other systems in the body. 7A	In-class assignments; exams
Discuss the roles that the sodium, potassium, calcium, and chloride channels play in the membrane potential and the generation of the action potential. 7A	In-class assignments; exams
Describe how neural transmission of a single neuron becomes translated into function. 7A	In-class assignments; exams
Using clinical reasoning, determine the possible impact of neurologic diagnoses on person's ability to participate in physical therapy. 7B	In-class assignments; exams

Numbers following the objectives refer to the CAPTE Standard 7 Curriculum.

## Course Delivery

This is a face-to-face course with learning resources and supplemental materials posted in Blackboard. A variety of teaching methods and learning activities will be utilized in the course including lecture, discussion, AV material, reading assignments, and case studies. However, dependent on university decisions, portions of this course may be online. In that event, the course will be delivered via the Blackboard Learning Management System and may be accessed at [ASU's Blackboard Learning Management System](#).

## Required Texts and Materials

1. Lundy-Ekman L. *Neuroscience: Fundamental for Rehabilitation* 5th ed. Philadelphia, PA: W. B. Saunders, 2018.

## Recommended Texts and Materials

1. Blumenfeld H. *Neuroanatomy through Clinical Cases 2<sup>nd</sup> ed.* Sunderland, MA: Sinauer Associates, Inc. 2010. (180-day access to e-book available online for \$60 from publisher)
2. Haines DE. *Neuroanatomy: An Atlas of Structures, Functions, and Systems.* Philadelphia, PA: Lippincott, Williams, and Wilkins, Any edition. Copies are available.
3. Moore KL, Dalley AF, Agur AMR. *Clinically Oriented Anatomy* 8<sup>th</sup> ed. Philadelphia, PA: Lippincott, Williams and Wilkins, 2018. (Used in PT 7710).

## Technology Requirements

To successfully complete this course, students will need a laptop or tablet with the following programs updated:

- Respondus Lockdown Browser and Monitor (which requires a webcam)
- Blackboard Collaborate (which requires a webcam)

Dependent on university decisions, portions of this course may be online. To participate in one of ASU's distance education programs, you need this technology:

- A computer capable of running Windows 7 or later, or Mac OSX 10.8 or later
- The latest version of one of these web browsers: Internet Explorer, Firefox, or Safari
- Microsoft Office Suite or a compatible Open Office Suite
- Adobe Acrobat Reader
- High Speed Internet Access
- Ethernet adapter cable required (wireless connections can drop during tests and Collaborate sessions)
- Webcam

Refer to Angelo State University's Distance Education website for further technology requirements: [Angelo State University's Distance Education Website](#)

## Communication

Faculty will respond to email and/or telephone messages within 24 hours during working hours Monday through Friday. Weekend messages may not be returned until Monday.

Office hours are by appointment only but are encouraged if needed. Please contact faculty via email or in person to set up an appointment.

# Grading

## Evaluation and Grades

Course grades will be determined as indicated in the table below.

Assessment	Percent/Points of Total Grade
Neuroanatomy Exam	20%
Two exams (22.5% each)	45%
Final Exam	30%
Five In-class Assignments (see peach highlighting)	5%
Total	100%

## Grading System

Course grades will be dependent upon completing course requirements and meeting the student learning outcomes.

The following grading scale is in use for this course:

A = 90.00 - 100 percent

B = 80.00 – 89.99 percent

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C = 70.00 -79.99 percent (DOES NOT MEET MASTERY)

F <70.00%

The neuroanatomy exam will be administered in the Anatomy Lab. Specimens, pictures, and line drawings may be used during the exam. Students will be expected to identify structures, identify function of structures, identify the blood supply to structures, or identify relationship between structures. Opportunities for mock exams will also be provided prior.

The exams in PT 7212 will be comprehensive and administered using Blackboard in the lockdown mode in the classroom. Please bring your technology with appropriate software. The exams will consist of multiple-choice questions. See the syllabus for scheduled times. Students are expected to take the exams at the scheduled times. Make-up quizzes and exams are at the discretion of the instructor. **Mastery on each exam is not required but the student must achieve a minimal competency level of 80% by the end of the semester. No retake of exams will be given.**

**Failure to achieve a minimal competency level of 80% by the end of the semester will result in the forwarding of the student records to the Academic Committee for consideration of options including possible Program dismissal.**

## **Teaching Strategies**

Students are expected to be “active learners.” It is a basic assumption of the instructor that students will be involved (**beyond the materials and lectures presented in the course**) discovering, processing, and applying the course information using peer-review journal articles, researching additional information and examples on the Internet, and discussing course material and clinical experiences with their peers.

## **General Policies Related to This Course**

All students are required to follow the policies and procedures presented in these documents:

- [Angelo State University Student Handbook](#)<sup>1</sup>
- [Angelo State University Catalog](#)<sup>2</sup>
- DPT Program Student Handbook located on the DPT Program page in Blackboard.

## **Student Responsibility and Attendance**

Attendance and promptness to classes, meetings, and future work obligations are considered professional behaviors. As this department is preparing potential professionals in the area of physical therapy, it is part of our expectation that student presence and timeliness will be held in highest regard. Tardiness is a disruption to the instructor and fellow students. A student is considered tardy if he/she arrives for class after the instructor has begun class activities. Please see the following related to implications from excessive lateness or absences without a reasonable excuse:

- a. First offense - verbal warning
- b. Second offense - second verbal warning, initiation of Disciplinary Tracking Form.
- c. Third offense - 1% off final course grade
- d. 1% off final course grade for each additional unexcused tardy or absence

**Per the student handbook, 2 or more occurrences combined or mixed will result in the initiation of a Disciplinary Tracking Form.**

If a student has an unexcused absence during integrations it may lead to the removal of that student from that clinical environment. It is the responsibility of the student to contact the clinical site and give notice if they are ill or have transportation issues.

If the student is unable to attend class, it is the student's responsibility to either call the PT office at 942-2545 or the office of the professor of the class directly. This notification should be made prior to commencement of said class.

Continued issues with tardiness/attendance across all courses will result in disciplinary probation and will be referred to the PT faculty for consideration of options, including program dismissal.

The PT faculty is not oblivious to doctor appointments and other potential hazards and emergencies in daily life. Simply taking responsibility to notify the office or the professor if issues arise is considered professional behavior. Please do not rely on a classmate or other form of notification, as these have proven unreliable in years past.

**ATTENDANCE AT ALL SCHEDULED EXAMINATIONS IN THE SCHEDULED LOCATION (e.g., CLASSROOM OR TESTING CENTER) IS MANDATORY.** Any unexcused absence from an examination will automatically result in a score of ZERO for that examination. Attempt(s) to take the exam in a location other than that scheduled by the professor without prior approval will automatically result in a score of ZERO for that examination. In the event that a student is late to an exam, that student will automatically receive a MINIMUM of 15 percentage points off of the total exam grade, and will ONLY be given the remainder of the time from the scheduled start time to finish the exam. Additionally, attempting to take the exam in an unscheduled location or being late to or absent from an exam will result in initiation of a disciplinary tracking form. Any student absent from examinations due to illness or injury must have a written justification from their physician. **Absence from or tardiness to an examination for any other reason must be excused before the time of the scheduled examination by the professor** or brought about by a very serious circumstance. For excused absences only, make-up examinations must be taken no later than one week after the student returns to class. Extended absences must be approved by the Program Director of Physical Therapy.

**Technology:** It is an expectation of the program that technology be used in a way that supports learning and benefits you and your classmates. Students must silence cell phones and place them out of sight during class unless instructed to use them by the professor. Permission may be granted, at the instructor's discretion, to have a cell phone out during class. Students seeking permission to have cell phones out during class must do so prior to the start of class. Points will be deducted from your final course grade at the discretion of faculty members if any technology (including but not limited to cell phone, tablet, laptop) is used in a manner that is not professional and beneficial in the learning environment. Additionally, the first offense

includes a verbal warning that will be documented in the behavioral tracking sheet. The second offense includes the initiation of a disciplinary tracking form. The third offense will result in the convening of a disciplinary committee to decide upon further disciplinary action.

## **Academic Integrity**

Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU.

The College of Health and Human Services adheres to the university's [Statement of Academic Integrity](#).<sup>3</sup>

## **Accommodations for Students with Disabilities**

ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA) and subsequent legislation.

Student Disability Services is located in the Office of Student Affairs, and is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability. It is the student's responsibility to initiate such a request by contacting an employee of the Office of Student Affairs, in the Houston Harte University Center, Room 112, or contacting the department via email at [ADA@angelo.edu](mailto:ADA@angelo.edu). For more information about the application process and requirements, visit the [Student Disability Services website](#).<sup>4</sup> The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

Dallas Swafford  
Director of Student Disability Services  
Office of Student Affairs  
325-942-2047  
[dallas.swafford@angelo.edu](mailto:dallas.swafford@angelo.edu)  
Houston Harte University Center, Room 112

## **Incomplete Grade Policy**

It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from



completing course work. Documentation may be required. See ASU Operating Policy 10.11 [Grading Procedures](#)<sup>5</sup> for more information.

## **Student Absence for Observance of Religious Holy Days**

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. See ASU Operating Policy 10.19 Student Absence for [Observance of Religious Holy Day](#)<sup>6</sup> for more information.

## **Plagiarism**

Plagiarism is a serious topic covered in ASU's [Academic Integrity policy](#)<sup>7</sup> in the Student Handbook. Plagiarism is the action or practice of taking someone else's work, idea, etc., and passing it off as one's own. Plagiarism is literary theft.

In your discussions and/or your papers, it is unacceptable to copy word-for-word without quotation marks and the source of the quotation. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list.

Papers are subject to be evaluated for originality. Resources to help you understand this policy better are available at the [ASU Writing Center](#).<sup>8</sup>

## **Copyright Policy**

Students officially enrolled in this course should make only one printed copy of the given articles and/or chapters. You are expressly prohibited from distributing or reproducing any portion of course readings in printed or electronic form without written permission from the copyright holders or publishers.

## **Syllabus Changes**

The faculty member reserves the option to make changes as necessary to this syllabus and the course content. If changes become necessary during this course, the faculty will notify students of such changes by email, course announcements and/or via a discussion board announcement. It is the student's responsibility to look for such communications about the course on a daily basis.

## **Title IX at Angelo State University**

Angelo State University is committed to providing and strengthening an educational, working, and living environment where students, faculty, staff, and visitors are free from sex discrimination of any kind. In accordance with Title VII, Title IX, the Violence Against Women Act (VAWA), the Campus Sexual Violence Elimination Act (SaVE), and other federal and state laws, the University prohibits discrimination based on sex, which includes pregnancy, and other

types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination and unwelcome behavior of a sexual nature. The term includes sexual harassment, nonconsensual sexual contact, nonconsensual sexual intercourse, sexual assault, sexual exploitation, stalking, public indecency, interpersonal violence (domestic violence or dating violence), sexual violence, and any other misconduct based on sex.

You are encouraged to report any incidents involving sexual misconduct to the Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator, Michelle Boone, J.D. You may submit reports in the following manner:

Online: [www.angelo.edu/incident-form](http://www.angelo.edu/incident-form)

Face to face: Mayer Administration Building, Room 210

Phone: 325-942-2022

Email: [michelle.boone@angelo.edu](mailto:michelle.boone@angelo.edu)

*Note, as a faculty member at Angelo State, I am a mandatory reporter and must report incidents involving sexual misconduct to the Title IX Coordinator. Should you wish to speak to someone in confidence about an issue, you may contact the University Counseling Center (325-942-2371), the 24-Hour Crisis Helpline (325-486-6345), or the University Health Clinic (325-942-2171).*

For more information about resources related to sexual misconduct, Title IX, or Angelo State's policy please visit: [www.angelo.edu/title-ix](http://www.angelo.edu/title-ix).

# Course Schedule

Week/Date	Topics	Reading
Week 1: January 21		
10am-12pm	-Syllabus review -Introduction to Neuroscience -Introduction to Neuroanatomy	-Syllabus -Lundy Ekman chapters 1, 2
1pm-3pm	Start on brain models Specimens: External & medial structures of the cerebrum*	
Week 2: January 28		
10am-12pm	-Brain and Environs -Cerebrospinal Fluid System -Blood Supply, Stroke, Fluid Dynamics, and Intracranial Pressure	-Lundy Ekman chapter 24, blood supply portion of chapter 2 -Supplementary: Blumenfeld ch. 5, 10
1pm-3pm	Brain Models: blood supply overlay Calvaria/skull Specimens: CSF, ventricles, vasculature*	
Week 3: February 4		
ONLINE	ONLINE LECTURES (ASYNCHRONOUS): -Physical and Electrical Properties of Nervous System Cells -Neural Communication: Synaptic and Extrasynaptic Transmission	-Lundy Ekman chapters 5, 6
Week 4: February 11		
10am-12pm	-Cerebrum -The Cerebellum and the Spinocerebellar Pathways	-Lundy Ekman chapters 26, 15
1pm-3pm	Brain models: cerebrum, blood supply overlay (review) Specimens: Cerebrum, cerebellum*	
Week 5: February 18		
10am-12pm	EXAM 1	
1pm-3pm	Cranial Nerves In class activity/assignment: CN	-Lundy Ekman chapter 19 -Review CN portion of neuro exam

Week/Date	Topics	Reading
Week 6: February 25		
10am-12pm	-Brainstem -Spinal cord	-Lundy Ekman chapter 18
1pm-3pm	Specimens: Brainstem, cranial nerves, spinal cord*	-Lundy Ekman chapter 20
Week 7: March 4		
10am-12pm	-Autonomic nervous system -Peripheral nervous system	-Lundy Ekman chapters 9-10
1pm-3pm	In class assignment/activity: ANS	
Week 8: March 11		
10am-12pm	-Motor systems	-Lundy Ekman chapter 14
1pm-3pm	Student-led mock lab exam* Catch up/cases/put it together (as needed)	-Supplementary: Blumenfeld ch. 6, 7 -Review motor portions of neuro exam
Week 9: March 18 SPRING BREAK		
Week 10: March 25		
10am-12pm	-Central somatosensory system	-Lundy Ekman chapter 7
1pm-3pm	In class assignment/activity: Motor and sensory tracts	-Supplementary: Blumenfeld ch. 6, 7 -Review sensory portions of neuro exam

Week/Date	Topics	Reading
Week 11: April 1		
10am-12pm	EXAM 2	
1pm-3pm	-Basal Ganglia	-Lundy Ekman chapter 16
Week 12: April 8		
10am-12pm	-Visual system -Vestibular system	-Lundy Ekman chapters 21-22
1pm-3pm	In class assignment/activity: visual system Specimens: Basal ganglia*	
Week 13: April 15		
9am-12pm	-Higher Order Cerebral Function Part 1	-Lundy Ekman chapters 27, 28, 29
1pm-3pm	No PM Lab	-Review mental status portion of neuro exam
Week 14: April 22		
10am-12pm	-Higher Order Cerebral Function Part 2 -Catch up/cases/put it together (as needed)	-Lundy Ekman chapters 27, 28, 29
12pm-1pm	Brain models	-Review mental status portion of neuro exam
Week 15: April 29		
10am-12pm	Review Day	
1pm-3pm	Mock Lab Exam* (?) - tentative	
Week 16: May 6		
10am-12pm	Lab Exam*	

Week/Date	Topics	Reading
Week 17: May 12		
10am-12pm	Final Exam	

\* denotes lab (or portion of lab) will be held in neuroanatomy lab

# Grading Rubrics

## PT 7212 In-Class Assignment Rubric

### **Understanding** (*Breadth of understanding - show what you know*)

\_\_\_ (5) Demonstrates excellent understanding of material

\_\_\_ (4.5) Demonstrates good understanding of material

\_\_\_ (3) Demonstrates fair/poor understanding of material - basics/definitions only with no application

\_\_\_ (0) Does not demonstrate understanding

### **Accuracy** (*Accurate to text/information learned in class*)

\_\_\_ (5) Completely accurate

\_\_\_ (3) Somewhat accurate

\_\_\_ (0) Completely inaccurate

### **Creativity and Engagement** (*Would you click a video of this? Is this a helpful way to learn and remember the material? \*\*Loss of clarity/quality NOT related to understanding/accuracy as that is graded above.\*\**)

\_\_\_ (5) Excellent creativity/engagement value without loss of clarity or quality of information

\_\_\_ (4.75) Good creativity/engagement value after feedback and changes, no loss of clarity/quality of information

\_\_\_ (4) Shows lower creativity/engagement value

\_\_\_ (3) Lacks creativity/engagement

**Total:** \_\_\_

**\*\*Please note that while there is no specific analysis of participation on this rubric, some in-class activities are not appropriate for grading based on a rubric and may be based on participation instead. Feedback from your groupmates may also be sought to aid in determining participation grades.**

**100%: full participation; cooperative; not disruptive**

**80%: lacks participation, cooperation, or is disruptive**

**70%: lacks more than 2 of the above**

**0%: lacks all of the above**

## **Student Evaluation of Faculty and Course**

Students in all programs are given the opportunity to evaluate their courses and the faculty who teach them. Evaluations are most helpful when they are honest, fair, constructive, and pertinent to the class, clinical experience, or course. Faculty value student evaluations, and use student suggestions in making modifications in courses, labs and clinical experiences.

Angelo State University uses the IDEA (Individual Development and Educational Assessment) system administered through Kansas State University for all course evaluations. The Office of Institutional Research and Assessment administers IDEA for the entire university, online and has established a policy whereby students can complete course evaluations free from coercion.

### **End of Syllabus**

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<sup>1</sup> <https://www.angelo.edu/student-handbook/>

<sup>2</sup> <https://www.angelo.edu/catalogs/>

<sup>3</sup> <https://www.angelo.edu/student-handbook/community-policies/academic-integrity.php>

<sup>4</sup> <https://www.angelo.edu/services/disability-services/>

<sup>5</sup> <https://www.angelo.edu/content/files/14197-op-1011-grading-procedures>

<sup>6</sup> <https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of>

<sup>7</sup> <https://www.angelo.edu/student-handbook/community-policies/academic-integrity.php>

<sup>8</sup> [https://www.angelo.edu/dept/writing\\_center/academic\\_honesty.php](https://www.angelo.edu/dept/writing_center/academic_honesty.php)