

# PTA 007: NEUROSCIENCE

---

**Originator**

bkfitzpatrick

**Co-Contributor(s)****Name(s)**

Wilson, Matthew

**Justification / Rationale**

Modified course to align content with CAPTE requirements

**Effective Term**

Fall 2022

**Credit Status**

Credit - Degree Applicable

**Subject**

PTA - Physical Therapist Assistant

**Course Number**

007

**Full Course Title**

Neuroscience

**Short Title**

NEURO SCI

**Discipline****Disciplines List**

Physical Therapy Assisting

**Modality**

Face-to-Face

**Catalog Description**

This course provides students with an overview of the neuroanatomy of the CNS and PNS, as it relates to treatment of patients with dysfunction in these systems. Emphasis includes structure and function of the nervous system, neurophysiological concepts, growth and development, and neurologic dysfunction. Upon completion of this course, the student should be able to identify and discuss specific neuroanatomical structures, basic functions of the nervous system, concepts of human growth and development, identify neurological pathologies and test for normal neurologic response and function.

Limitation on enrollment: Admission to the Physical Therapist Assistant (PTA) Program

**Schedule Description**

This course focuses the on anatomy and function of the neurological system, including the treatment of patients with dysfunction of this system.

Prerequisite: PTA 002

Advisory: ENG 061

Limitation on enrollment: Admission to the Physical Therapist Assistant (PTA) Program

**Lecture Units**

2

**Lecture Semester Hours**

36

**Lab Units**

1

**Lab Semester Hours**

54

**In-class Hours**

90

**Out-of-class Hours**

72

**Total Course Units**

3

**Total Semester Hours**

162

**Prerequisite Course(s)**

PTA 002

Advisory: ENG 061

**Limitation on Enrollment**

Admission to the Physical Therapist Assistant (PTA) Program.

**Required Text and Other Instructional Materials****Resource Type**

Book

**Author**

Tecklin, J.S.

**Title**

Pediatric Physical Therapy

**Edition**

5th ed.

**Publisher**

Wolters Kluwer

**Year**

2015

**College Level**

Yes

**Flesch-Kincaid Level**

N/A

**ISBN #**

9781451173

---

**Resource Type**

Book

**Author**

Staples, W.H.

**Title**

Geriatric Physical Therapy

**Edition**

1st ed.

**Publisher**

McGraw-Hill

**Year**

2016

**College Level**

Yes

**Flesch-Kincaid Level**

N/A

---

**Class Size Maximum**

25

**Entrance Skills**

Identify and employ prewriting activities.

**Requisite Course Objectives**

ENG 061-Use theses to organize paragraphs into coherent analyses.

---

**Entrance Skills**

Comprehend and summarize readings.

**Requisite Course Objectives**

ENG 061-Demonstrate the ability to read and respond in writing beyond the literal interpretation of the text.

---

**Entrance Skills**

Generate, develop, and organize ideas in writing.

**Requisite Course Objectives**

ENG 061-Recognize features of style such as purpose, audience and tone integrate these elements into academic and professional writing.

---

**Entrance Skills**

Identify various "red flag" conditions where referral is needed

**Requisite Course Objectives**

PTA 002-Identify "red flag" issues based on clinical indications for varying conditions and patient presentations.

---

**Course Content**

1. Neuroanatomy
  - a. CNS
  - b. PNS
2. Growth and development
  - a. Birth to senescence
    - i. Compare theoretical concepts to patient problems encountered in the clinical setting.
3. Fetal development
  - a. Conception to birth
    - i. Outlining changes in the neurological, cardiovascular, and musculoskeletal systems.
4. Fetal development process
5. Reflex development
  - a. Age ranges
6. Abnormal reflexes

- a. Neurologically impairments
  - i. Child and adult
  - ii. Compare and contrast
- 7. Sensory and motor enrichment
  - a. Deprivation
  - b. Growth and development
- 8. Neurological pathologies
  - a. CNS
  - b. PNS

### Lab Content

1. Myotomes
2. Dermatomes
3. Reflexes
4. Neonatal Reflexes
5. NDT
6. PNF
7. Balance systems

### Course Objectives

	Objectives
Objective 1	Describe normal anatomy and function of the CNS and PNS and normal fetal development.
Objective 2	Analyze neurological pathologies and the PTA's role in addressing common impairments in these conditions.
Objective 3	Demonstrate proficiency in implementing functional training of a patient with a neurological impairment and monitor and adjust these interventions in response to patient status and clinical indications including the assessment of a patient's pain.
Objective 4	Explain and proficiently implement motor function training, including balance and gait with a orthotic or prosthetic device as needed, as identified in the plan of care established by the physical therapist and which demonstrates sound moral reasoning congruent with core professional ethics and values.
Objective 5	Summarize and perform appropriate tests and measures of gait, locomotion, and balance to determine the safety, progression, and status of patients with neurological pathologies, including the International Classification of Functioning, Disability, and Health.
Objective 6	Perform with excellence appropriate tests and measures of muscle performance including measuring muscle strength and recognition of changes in muscle tone in the neurological patient. In addition, educate patients on integumentary monitoring and the potential impact of muscle tone on skin breakdown.
Objective 7	Illustrate the assessment of neuromotor development including detecting gross motor milestones, fine motor milestones, and righting and equilibrium reactions.
Objective 8	Respond effectively to patient and environmental emergencies that commonly occur in the neurological clinic setting.
Objective 9	Consistently and accurately analyze a patients' posture including normal and abnormal alignment of trunk and extremities at rest and during activities, and communicate effectively with patients in attainment of this data.
Objective 10	Effectively administer appropriate tests and measures related to assistive technology for patients with neurological impairments, including identifying the individual's and caregiver's abilities to care for the device, recognize changes in skin condition and safety factors while using devices and equipment, and in addition report suspected cases of abuse of vulnerable populations to the appropriate authorities.
Objective 11	Assess the appropriateness of following through on the plan of care by inspecting physical environments, measuring physical space, recognizing safety and barriers in the environment, recognizing the level of functional status, and administering standardized questionnaires to patients and others.

### Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Understand neurological developmental process and function of CNS and PNS.
Outcome 2	Apply understanding of neurological pathologies and their effect on human function and outcomes.
Outcome 3	Demonstrate assessment of neurological function and treatment of neurological dysfunction.

### Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Collaborative/Team	Cohort model used in class. Teams will work together to develop programs and analyze classmate work.
Demonstration, Repetition/Practice	Instructor demonstrations of specific learning unit materials including documentation of field notes.
Discussion	Small groups are formed at the beginning of class to familiarize students to topic, and large group discussions follow.
Lecture	Topics include normal and abnormal rehabilitation treatments. Twenty-to thirty-minute lectures are interspersed with interactive activities, discussion, and practice.
Laboratory	Demonstration of skills, followed by group/partner practice.

### Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
Written homework	SOAP (Subjective, Objective, Assessment, Plan) notes documentation (a minimum of 6 hours per week).	In and Out of Class
Mid-term and final evaluations	Check for learning. Mid-term and final exams will be given (100 questions total). Six quizzes given to prepare for exams (20 questions each).	In Class Only
College level or pre-collegiate essays	Case studies assigned to write outside of class (a minimum of three cases, 2 pages each).	Out of Class Only
Oral and practical examination	Scenario-based examination of skills.	In Class Only

### Assignments

#### Other In-class Assignments

##### Reading Assignments

1. Journal articles and handouts on topics relevant to physical therapy through the lifespan.

##### Projects, Activities, and other Assignments

1. Playground assessment - students evaluate a local playground for safety.
2. Senior Health Fair - PTA students provide blood pressure and balance screens for the community's seniors.

#### Other Out-of-class Assignments

##### Reading Assignments

1. Assigned readings from texts

##### Projects, Activities, and other Assignments

1. Timeline Presentation and Paper - Students select a developmental time frame and then create a PowerPoint presentation for the class along with a one-page review sheet.

##### Writing Assignments

1. Pediatric Observation Paper - PTA students observe students at an elementary school and then write a paper.
2. Geriatric Observation Paper - PTA Students observe Senior Fitness classes (either aerobic or strengthening) and then write a paper.

### Grade Methods

Letter Grade Only

### MIS Course Data

#### CIP Code

51.0806 - Physical Therapy Technician/Assistant.

#### TOP Code

122200 - Physical Therapist Assistant

**SAM Code**

C - Clearly Occupational

**Basic Skills Status**

Not Basic Skills

**Prior College Level**

Not applicable

**Cooperative Work Experience**

Not a Coop Course

**Course Classification Status**

Credit Course

**Approved Special Class**

Not special class

**Noncredit Category**

Not Applicable, Credit Course

**Funding Agency Category**

Not Applicable

**Program Status**

Program Applicable

**Transfer Status**

Not transferable

**Allow Audit**

No

**Repeatability**

No

**Materials Fee**

No

**Additional Fees?**

No

**Files Uploaded****Attach relevant documents (example: Advisory Committee or Department Minutes)**

2017 - Meeting Notes - 05-16-17.pdf

LMI\_Physical Therapy\_Dec2017.pdf

PTA 007 CO Approval Letter.pdf

**Approvals****Curriculum Committee Approval Date**

03/17/2022

**Academic Senate Approval Date**

03/24/2022

**Board of Trustees Approval Date**

04/22/2022

**Chancellor's Office Approval Date**

05/06/2022

**Course Control Number**

CCC000631406