

***This is a SouthArk Master Syllabus. The course syllabus distributed by the instructor may include additional requirements, must be followed by the student in the given term, and is considered to supersede the Master Syllabus.***

**Course Number / Term**

PTAP 2514/L

**Course Title**

Neurophysiological & Rehabilitation Techniques / Lab

**Course Description**

Course Description: This course encompasses the study of neuroanatomy; normal and abnormal development; medical, surgical and physical therapy management of neurological diseases/conditions; facilitation/inhibition techniques; PNF; motor control and developmental sequence techniques; balance, orthotics; and functional and environmental assessment. Emphasis shall also be placed on understanding the psycho-emotional issues encountered by patients / families, the students' effective oral and written communication, and the PTA's role in assisting the supervising PT with discharge planning.

Lecture: 48 contact hours

Lab: 33 contact hours

**College Mission**

South Arkansas Community College promotes excellence in learning, teaching, and service; provides lifelong educational opportunities; and serves as a cultural, intellectual, and economic resource for the community.

**College Wide Student Learner Outcomes**

Critical Thinking                       Responsibility                       Communication

**ACTS Course**                       **Program Course**                       Physical Therapist Assistant

**ACTS Outcomes**

NA

**Program Goals and Objectives / Outcomes**

PTAP 2514/L includes preparation in the cognitive, affective, and psychomotor domains utilizing critical thinking to become competent entry-level Physical Therapist Assistants. The student successfully completing this course

- 1) Works under the supervision of a Physical Therapist (PT) in providing patient care services after the PT performs the initial evaluation and delegates responsibilities to the Physical Therapist Assistant (PTA).
- 2) Defines and applies the scope of practice of PTAs within the team of health care providers.
- 3) Exhibits conduct that reflects a commitment to the profession while safely, ethically, and legally practicing within the field of physical therapy.
- 4) Applies knowledge of anatomy and physiology of the human body as related to pathologies / injuries commonly seen in the practice of physical therapy.
- 5) Performs selected physical therapy interventions within the plan of care; adjusts interventions as indicated; and reports to supervising PT.
- 6) Performs data collection skills as directed by the supervising PT and reports to supervising PT.
- 7) Communicates effectively, verbally, nonverbally, and in writing, with patients and their families, the supervising PT, other members of the physical therapy staff, and all members of the health care team.
- 8) Recognizes and responds appropriately to the emotional, psycho-social, economic, and relational aspects of physical therapy care with an appreciation of individual and cultural differences.

**Course Learner Objectives / Outcomes**

CLO #	Course Learner Outcomes (CLO)	Unit Outcomes/ Competencies	Program Outcomes	Critical Thinking	Communication	Responsibility	Assessment
CLO 1	Describe CNS function, normal and abnormal development	1, 2, 3, 4, 5	4	CT1			Written examinations

CLO 2	Describe theory, principles and techniques for neuro rehab including interventions for selected diagnoses	5, 7, 9, 10, 13, 14, 17	1, 2, 3, 5, 6			R2	Written examinations
CLO 3	Describe techniques to improve motor control, including functional assessment/activities, patient instruction, architectural barriers, orthoses, wheelchairs, role of PTA in discharge planning	6, 7, 10, 11, 12, 15, 16	1, 2, 3, 5, 6	CT3		R2	Written examinations
CLO 4	Demonstrate competency in PNF techniques	8, 10	5, 7, 8		C2	R2	Written examinations Lab practical examination
CLO 5	Demonstrate competency in performing technique to improve motor control	6, 7, 10	5, 7, 8		C2	R2	Written examinations Lab practical examinations

### Unit Objectives / Outcomes / Competencies

The student successfully completing this course will be able to

1. Describe the stages of human growth and development, including physiological, cognitive, emotional and behavioral changes that occur throughout development.
2. Explain normal sensorimotor development (integration of reflexes, synergies, and postural reactions).
3. Explain the effects of abnormal integration of reflexes, synergies, and postural reactions.
4. Provide a basic description of neuroanatomy as related to CNS function, neuronal and cognitive control of movement and posture.
5. Describe the theory, principles and techniques used in physical therapy for the treatment of neurological conditions.
6. Demonstrate competency in the performance of techniques used to improve motor control, including facilitation, inhibition, reflex inhibiting postures, and the use of developmental activities.
7. Describe and perform therapeutic techniques designed to improve patients' functional abilities including preambulation exercise programs, balance, equilibrium, functional activities, gait training, bed mobility activities and ADLs.
8. Demonstrate competency in performing PNF D1 and D2, UE and LE, unilateral and bilateral patterns.
9. Explain the progression of patient treatment within the plan of care developed by the Physical Therapist for various neurological conditions.
10. Instruct verbally and in writing patients, family members, and other health care providers in the physical therapy care of the patient.
11. Perform functional assessments.
12. Identify architectural barriers and discuss home modifications.
13. Discuss the etiology, pathophysiology, and special needs of patients with various neurological injuries / conditions (CVA, TBI, MS, Parkinsonism, SCI, ALS), including appropriate physical therapy interventions, impact on family and psycho-social issues, and documentation of therapeutic procedures.
14. Discuss the etiology, pathophysiology, and special needs of pediatric patients with various pediatric neurological conditions (CP, Down Syndrome, MR, Spina Bifida, Juvenile RA, MD), including appropriate physical therapy interventions, impact on family and psycho-social issues.
15. Describe the components and fit for orthoses and prescriptive wheelchairs.
16. Discuss the PTA's role in assisting supervising PT with discharge planning.
17. Conduct electronic (internet) search of selected medical topics.

### Course Outline:

- I. Human growth and development, prenatal to geriatrics
  - A. Identification of stages of growth and development; developmental sequence
  - B. Physiological growth and development
  - C. Cognitive growth and development
  - D. Emotional growth and development
  - E. Behavioral growth and development
- II. Sensorimotor development, integration and control
  - A. Stages of sensorimotor development
  - B. Reflexes, synergies and automatic postural reactions
    1. Normal reflexes, primitive synergies, and automatic postural reactions

2. Integration of normal reflexes, primitive synergies, and development of postural reactions
3. Effects of poor integration of normal reflexes, synergies, and postural reactions
- C. Movement control
- D. Postural control
- III. Neuroanatomy review
  - A. CNS function
  - B. Neuronal mechanisms of movement and posture
  - C. Cognitive processing
- IV. Theory and application of neurophysiological techniques of therapeutic exercise and rehabilitation
  - A. Principles and techniques: PNF, NDT, Rood, Brunnstrom
  - B. Clinical application
    1. Strategies to improve motor control
      - a. Facilitation
      - b. Inhibition
      - c. Reflex inhibiting postures
      - d. Handling techniques
    2. Use of developmental sequence
    3. Preambulation exercise programs
    4. Balance, equilibrium, and gait training for neurological conditions
    5. Bed mobility activities
    6. Functional training and ADLs
    7. Developmental activities
    8. PNF D1 and D2, UE and LE, unilateral and bilateral
  - C. Treatment progression within the plan of care developed by the Physical Therapist
  - D. Instruction of patient, family members, and other health care providers
  - E. Home assessment and modifications
  - F. Functional assessments
  - G. Identification of architectural barriers
  - H. Documentation of treatment techniques and assessments
- V. Rehabilitation for specific neurological patients
  - A. Cerebrovascular Accident (CVA) / Stroke
    1. Etiology
    2. Pathophysiology
    3. Stages of recovery (coma scales, flaccidity, spasticity, relative recovery)
    4. Potential deficits
      - a. Motor
      - b. Sensory
      - c. Cognitive
      - d. Perceptual
      - e. Language
      - f. Emotional / behavioral
    5. Ambulation and/or wheelchair mobility
    6. Proper positioning
    7. Psycho-social impact on patients and family
    8. PTA's role in assisting supervising PT with discharge planning
  - B. Traumatic head injury
    1. Etiology
    2. Pathophysiology
    3. Similarities and differences from CVA
    4. Potential deficits
      - a. Motor
      - b. Sensory
      - c. Cognitive
      - d. Perceptual
      - e. Language
      - f. Emotional / behavioral
    5. Psycho-social impact on patients and family
    6. PTA's role in assisting supervising PT with discharge planning
  - C. Multiple Sclerosis
    1. Etiology
    2. Pathophysiology
    3. Stages of progression (exacerbations / remissions)

4. Potential deficits
    - a. Motor
    - b. Sensory and skin care
    - c. Cognitive
    - d. Tone
    - e. Coordination
    - f. Emotional / behavioral
  5. Cryotherapy as a contraindication for MS
  6. Psycho-social impact on patients and family
  7. Frenkel's exercises
  8. PTA's role in assisting supervising PT with discharge planning
- D. Parkinsonism
1. Etiology
  2. Pathophysiology
  3. Medical / pharmacological management
  4. Potential deficits
    - a. Motor (tone, rigidity)
    - b. Balance
    - c. Coordination
    - d. Gait patterns (festinating, propulsive gait)
    - e. Flat affect
    - f. Emotional / behavioral
  5. Psycho-social impact on patients and family
  6. PTA's role in assisting supervising PT with discharge planning
- E. Traumatic spinal cord injury
1. Etiology
  2. Pathophysiology
  3. Description of level of injury
  4. Expected level of performance of functional activities based upon level of injury
  5. Potential deficits
    - a. Motor
    - b. Sensory
    - c. Spasticity, clonus
    - d. Skin care risks
    - e. Emotional / behavioral
  6. Ambulation
  7. Prescriptive wheelchairs
  8. Psycho-social impact on patients and family
  9. PTA's role in assisting supervising PT with discharge planning
  10. Internet search
- F. Amyotrophic Lateral Sclerosis
1. Etiology
  2. Pathophysiology
  3. Impairments related to
    - a. UMN
    - b. LMN
    - c. Bulbar
    - d. Respiratory
    - e. Cognitive
  4. Disease course / progression
  5. Management
- G. Specific pediatric conditions: Cerebral Palsy, Down Syndrome, Mental Retardation, Spina Bifida, Juvenile Rheumatoid Arthritis, high risk infants, Muscular Dystrophy
1. Etiology
  2. Pathophysiology
  3. Potential deficits
    - a. Motor
    - b. Sensory
    - c. Cognitive
    - d. Perceptual
    - e. Language
    - f. Emotional / behavioral

4. Special needs of the pediatric patient
    - a. Use of play as a modality
    - b. Adaptive equipment
  5. Psycho-social impact on patients, family and school
  6. Assistive devices
  7. Patient and family education in exercises, functional activities and ADLs
  8. PTA's role in assisting supervising PT with discharge planning
  9. Role of PT and PTA in school system
  10. Internet search
- H. Orthoses
1. Terminology
  2. Indications / contraindications
  3. Fit assessment
- I. Prescriptive wheelchairs
1. Terminology and components
  2. Indications / contraindications
  3. Fit assessment

### Assessment Description(s)

Written examinations are criterion referenced scored.

Homework assessed based upon departmental rubric.

Lab practical examinations are scored based upon departmental rubric.

### Materials and Technological Requirements

Physical Rehabilitation for the Physical Therapist Assistant, by Cameron & Monroe, Elsevier Publishing, 2011.

ISBN: 978-1-4377-0806-6

Neurologic Interventions for Physical Therapy, 2nd edition, by Suzanne Martin and Mary Kessler, W.B. Saunders

Publisher, 2007. ISBN: 978-0-7216-0427-5

### Class Attendance Policy

Students are expected to attend all classes in which they are enrolled. If a student is absent from a class session, it is the student's responsibility to make arrangements to complete or make up any work missed. No make-up work for missed classes will be allowed without the approval of the instructor. Students who enroll late must assume all responsibility for work missed. Classes not attended as a result of late enrollment may be counted toward excessive absences. Students not attending the entire class period may be counted absent for that period. An instructor may drop students with a grade of "WE" if students have been absent for an excessive number of days. Warning letters will be sent to the students advising them of the consequences of nonattendance and urging them to contact their instructors immediately. Excessive absences are defined as follows:

#### Regular Semester

Courses which meet once a week.....	2 absences
Courses that meet twice per week .....	3 absences
Courses that meet four times per week.....	5 absences

#### Summer Session

Courses that meet four times per week in a five week session .....	3 absences
Courses which meet two evenings per week in a 10 week session.....	3 absences

Students enrolled in special programs or individualized instruction should contact their program director/instructor regarding specific attendance requirements for the program/course. Some of the selective-admission, health-science programs have specific criteria regarding attendance. Students are encouraged to refer to program policies in these matters.

#### Jury Duty/Military/Official School Function

Scheduled absences are those that occur due to college-related activities or as a result of summons to jury duty or military duty. Classes missed as a result of scheduled absences will not be counted as excessive absences if the instructor is notified and provided documentation prior to the absence(s). Make-up work for scheduled absences will be at the discretion of the instructor.

In all instances, documentation must be provided to the instructor within 24 hours of receipt. Documentation should come from an appropriate party on letterhead or other official stationery with a signature and contact information. Documentation should list the corresponding dates of the leave.

### Medical leave

For medical-related absences, documentation must include written notice from the treating medical professional documenting time needed off related to medical reasons and time student may resume classes. The medical reason does not need to be listed on the documentation; the documentation must include only that there is a medical reason, the amount of time the student needs to be absent, and the time the student should be able to return to classes. Students who elect to work at home while on excused leave must meet with their instructors to make arrangements to do so. Working on coursework while on medical leave is not a requirement but can be requested by students. If students request that they be allowed to work at home while on an excused leave, the instructor will make every reasonable effort to ensure that the student is able to do so.

For students who have a medical condition necessitating time off or accommodation:

- 1) They may work at home on assignments if they choose to if on medical leave approved by a medical professional
- 2) Receive appropriate accommodations related to coursework (i.e., excused from labs with potentially harmful chemicals, have a larger desk, etc.)
- 3) Resume their studies where they left off once they return to classes
- 4) Be allowed to make up any missed work related to medical leave
- 5) Receive incompletes on their transcripts until coursework is completed, according to the incomplete grade contract.
- 6) Be given a reasonable time frame in which to complete missed coursework

### **Academic Honesty Policy**

Students enrolled at South Arkansas Community College are expected at all times to uphold standards of integrity. Students are expected to perform honestly and to work in every way possible to eliminate academic dishonesty. Academic dishonesty includes cheating and plagiarism, which are defined as follows:

- Cheating is an attempt to deceive the instructor in his/her effort to evaluate fairly an academic exercise. Cheating includes copying another student's homework, class work, or required project (in whole or in part) and/or presenting another's work as the student's own. Cheating also includes giving, receiving, offering, and/or soliciting information on a quiz, test, or examination.
- Plagiarism is the copying of any published work such as books, magazines, audiovisual programs, electronic media, and films or copying the theme or manuscript of another student. It is plagiarism when one uses direct quotations without proper credit or when one uses the ideas of another without giving proper credit. When three or more consecutive words are borrowed, the borrowing should be recognized by the use of quotation marks and proper parenthetical and bibliographic notations.

If, upon investigation, the instructor determines that the student is guilty of cheating or plagiarism, the following penalties will apply:

- The student will receive a penalty of no less than a zero on the work in question.
- The instructor will submit a Student Academic Misconduct Form, written report of the incident, to the appropriate dean.
- The dean will submit form to Vice President for Learning to determine disciplinary action.
- The Vice President for Learning will determine whether further disciplinary action will be taken.
- All decisions may be appealed for review through the college's academic appeals procedure.

### **Equal Opportunity-Affirmative Action Statement**

South Arkansas Community College does not discriminate on the basis of age, race, color, creed, gender, religion, marital status, veteran's status, national origin, disability, or sexual orientation in making decisions regarding employment, student admission, or other functions, operations, or activities.

### **Library Services**

Library Homepage: <http://southark.libguides.com/homepage> Library Contact: LibraryStaff@southark.edu or 870.864.7115

### **Procedures to Accommodate Students with Disabilities:**

If you need reasonable accommodations because of a disability, please report this to the Vice President of Student Services with proper documentation. . VPSS Contact: 870.875.7262

### **The Early Alert System**

In an effort to ensure student retention and success, South Arkansas Community College employs an Early Alert System to identify and support at-risk students as soon as possible in a given semester. The intent of Early Alert is to provide this assistance while there is still time to address behaviors or issues that have the potential of preventing students from completing their courses and degree plans. Students referred through the Early Alert System will be required to work on a

corrective action plan with their student advising coach and to include attendance accountability and mandatory academic tutoring either in the academic division or in the Testing and Learning Center (TLC).

Once the Student Advising Coach has met with the referred student, and again when the student has met the prescribed corrective actions, the coach will update the Early Alert System so that the instructor is kept informed of the progress in resolving issues.

**Behavioral Review Team**

At South Arkansas Community College (SouthArk), we are committed to proactive leadership in student wellbeing and campus safety. By focusing on prevention and early intervention with campus situations that involve any person experiencing distress or engaging in harmful or disruptive behaviors, the BRT will serve as the coordinating hub of existing resources to develop intervention and support strategies and offer case management. Students, faculty, staff, and campus guests are encouraged to report any person on campus who is a concern. BRT Contact: 870.875.7262  
BRT@southark.edu

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