

## LABETTE COMMUNITY COLLEGE BRIEF SYLLABUS

### **SPECIAL NOTE:**

This brief syllabus is not intended to be a legal contract. A full syllabus will be distributed to students at the first class session.

### **TEXT AND SUPPLEMENTARY MATERIALS USED IN THE COURSE (if any):**

Please check with the LCC bookstore <http://www.labette.edu/bookstore> for the required texts for this class.

<b><u>COURSE NUMBER:</u></b>	PTA 203
<b><u>COURSE TITLE:</u></b>	NEUROLOGICAL REHABILITATION
<b><u>SEMESTER CREDIT HOURS:</u></b>	5
<b><u>DEPARTMENT:</u></b>	Health Science
<b><u>DIVISION:</u></b>	Career Technical Education
<b><u>PREREQUISITE:</u></b>	Admission to the PTA program.
<b><u>REVISION DATE:</u></b>	July 2012

### **COURSE DESCRIPTION:**

This course is designed to introduce various neurological diseases as well as the treatments used by physical therapy professionals. Emphasis will be on assessments and treatments appropriate for the physical therapist assistant. Theoretical foundations, management, functional problems and movement disorders are covered.

### **COURSE OUTCOMES AND COMPETENCIES:**

**Students who successfully complete this course will be able to:**

1. Identify the major structures of the nervous system and describe their functions.
  - Describe the gross anatomical components and relationships of the nervous system.
  - List the lobes of the brain and describe their primary functions.
  - List the tracts of the spinal cord and describe their primary functions.
  - List the components of the peripheral nervous system and describe their functions.
  - Describe the patterns of peripheral nerves and innervations of skin and skeletal muscles and differentiate these patterns from dermatomal and myotomal patterns.
  - List the cranial nerves and their functions.
  - List the anatomical components of the ANS and their functions.
  - Describe the classification and function of the receptor mechanisms involved in the perception of sensation.

2. Describe the major concepts of neurophysiology.

- Describe how neurotransmission occurs at the cellular level.
- Explain how a lack of a neurotransmitter substance affects human movement.
- Describe the implications of neurotransmission on human function.
- Identify neuroplasticity changes across the life span.

3. Discuss motor development, motor control, motor learning and neuroplasticity.

- Identify normal gross and fine motor skills development.
- Identify primitive reflexes and the possible negative effect on movement with abnormal persistence of each reflex.
- Analyze normal movement strategies.
- Identify normal changes in motor strategies over a lifetime and analyze differences between normal movement as one ages and pathological movement problems.
- Differentiate concepts of motor control from motor learning or neuroplasticity.
- Identify and analyze the parameters of motor control.
- Explain the development of postural control and balance.
- Analyze abnormal movement strategies.
- Relate motor control and motor learning theories to therapeutic intervention.
- Describe the acquisition and refinement of fundamental movement patterns during childhood.
- Describe the relationship of cognition and motivation to motor control.
- List and define the behavior of the muscle belly upon palpation, at rest and during activity.
- List and differentiate the terms used to describe abnormal tone.

4. Discuss the purpose and elements of a sensory assessment and an assessment of the cranial nerves.

- Identify the purpose(s) of performing a sensory exam.
- Describe the relationship between preliminary mental screening tests and tests for sensory integrity.
- Identify the spinal pathways that mediate sensation.
- Describe the guidelines for administering a sensory assessment.
- Perform a complete sensory assessment and record these findings.
- Perform an assessment of the cranial nerves and record these findings.

5. Discuss the management of functional problems and movement disorders related to infants and children.

- Identify the parameters of the diagnosis of cerebral palsy (CP) and spina bifida including motor, family and psychosocial components.

- Analyze the multifaceted aspects of CP and spina bifida and appreciate a multifaceted approach to evaluation and treatment.
- Analyze treatment strategies for patients with CP and spina bifida and their application to clinical problems.
- Identify the PTA's role in the treatment of the child with cerebral palsy or spina bifida, with family involvement, in different settings and with other health professionals.
- Describe the main types of genetic disorders and give examples of each type.
- Explain why it is important to include family members in the planning and development of therapy programs for children with genetic disorders.
- Describe and give examples of three types of assessment tools used with children with learning disabilities and state the intended purpose of each.
- Describe the importance of developing therapy programs for children with genetic disorders that are outcome focused on functional skills in natural environments.
- Identify three medical treatments that may be used for children with genetic disorders to ameliorate the effects of the disorder.
- Explain why it is important for physical therapist assistant to have knowledge of the services available through genetic counseling.
- List characteristics that typically identify a child with learning disabilities.
- Identify accepted definitions and terminology used in the field of learning disabilities.
- Describe the clinical presentation of subgroups within the learning-disabled population.
- List and describe the members of the specialist team and service provision types for children with learning disabilities.
- Recognize the characteristics of the child with developmental coordination disorder.
- Identify areas of evaluation to assess motor deficits effectively in the child with a learning disability.
- List and demonstrate theoretical development and intervention techniques applicable to children with learning disabilities and motor deficits.
- Describe the lifelong ramifications for the individual with learning disabilities.
- Describe the use of positioning and handling as interventions to improve function in children with neurological disorders.
- Identify the goals for use of adaptive equipment with children who have neurologic deficits.
- Identify common medications used with CP.

<p>6. Discuss, describe and demonstrate the concepts of proprioceptive neuromuscular facilitation (PNF), the neurodevelopmental treatment approach (NDT), Brunnstrom and neuromuscular/sensory stimulation (Rood) techniques.</p>
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- Describe the philosophy of PNF.
- List the PNF patterns for the extremities and trunk.
- Describe the application of PNF for the extremities and trunk.
- Define the basic procedures for facilitation
- Identify the most appropriate PNF techniques for simulated patients.

- Demonstrate basic PNF techniques for the extremities and trunk.
- Demonstrate the use of PNF techniques to promote functional activities and transitions.
- Document a PNF treatment.
- Describe the history and neurological basis for NDT.
- Describe the basic principles of NDT.
- Define terminology used with NDT.
- Identify NDT techniques used to promote functional activities and transitions.
- Demonstrate NDT strategies on a simulated patient with a neurological impairment affecting the upper motor neuronal system.
- Document an NDT session.
- Identify key terms and techniques utilized with Brunnstrom's technique.
- List the seven stages of recovery according to Brunnstrom's technique.
- Identify commonly used terms to describe neuromuscular/sensory (Rood) techniques.
- For each technique, list the stimulus, response, techniques and adverse effects.
- Demonstrate the use of neuromuscular/sensory techniques on a simulated patient.
- Document the use of neuromuscular/sensory techniques.

7. Discuss management of functional problems and movement disorders related to clients with cerebrovascular accidents (CVA), traumatic brain injuries (TBI), spinal cord injuries and other neurological diseases.

- Describe the etiology and clinical manifestations of CVA.
- Identify common complications seen in patients who have sustained a CVA.
- Explain the role of the PTA in the treatment of patients after a CVA.
- Demonstrate appropriate treatment interventions for patients who have experienced a CVA.
- Recognize the importance of functional training for patients who have had a CVA.
- Identify causes and mechanisms of TBI.
- List secondary complications associated with TBI.
- Compare and contrast the Glasgow Coma Scale with the Glasgow Outcome Scale.
- Identify appropriate uses for and define the following clinical rating scales: Ranchos Los Amigos Level of Cognitive Functions, Galveston Orientation and Amnesia Test, Disability Rating Scale, Functional Independence Measure, and Functional Assessment Measure,
- Demonstrate appropriate treatment interventions to facilitate functional movement in a patient with TBI.
- Discuss strategies that will improve cognitive deficits associated with TBI.
- Identify the causes, clinical manifestations and possible complications of SCI.
- Differentiate between complete and incomplete types of spinal cord injuries.
- Discuss the various levels of spinal cord injury.
- Relate the segmental level of muscle innervations to the level of function in the patient with a SCI.

- Instruct a simulated patient with a SCI in pulmonary exercises, strengthening exercises and mat activities.
- Teach gait training and wheelchair mobility techniques to a patient with a SCI, as appropriate to the level of function.
- Describe the incidence, etiology and clinical manifestations of Parkinson disease, multiple sclerosis, Guillain-Barré syndrome, amyotrophic lateral sclerosis and postpolio syndrome.
- List typical medical and surgical management of persons with Parkinson disease, multiple sclerosis, Guillain-Barré syndrome, amyotrophic lateral sclerosis and postpolio syndrome.
- Identify and demonstrate specific treatment interventions relative to the stage/degree of progression and level of impairment or functional limitations of persons with Parkinson disease, multiple sclerosis, Guillain-Barré syndrome, amyotrophic lateral sclerosis and postpolio syndrome.
- Discuss strategies for patient and family education to address functional limitations of individuals with Parkinson disease, multiple sclerosis, Guillain-Barré syndrome, amyotrophic lateral sclerosis and postpolio syndrome.
- Discuss client progression and the process of discharge planning, in cooperation with the physical therapist, throughout the rehabilitation process.
- Identify equipment needs for a given neurological condition.
- Structure the assessment of the patient with a neurological condition to gather information required to generate a progress note.
- Identify common medications used with CVA, TBI, SCI, Parkinson disease, multiple sclerosis, Guillain-Barré syndrome, amyotrophic lateral sclerosis and postpolio syndrome.

<p>8. Discuss management of functional problems and movement disorders related to balance and vestibular disorders.</p>
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- Describe both central and peripheral sensory and motor components of the postural control system.
- Identify and analyze the function of the vestibular system in balance activities.
- List causes of vertigo, dizziness and disequilibrium not associated with the vestibular system.
- List and administer commonly used balance tests.
- Differentiate how test results are used to identify impairments and disabilities.
- Analyze the interaction of individual, task and environmental factors that affect balance.
- Describe how to progress balance exercises programs to increase the use of, or compensation with, available sensory inputs.
- Describe how to progress balance exercise programs to increase the control of center of gravity in upright postures during gait.
- Describe how to facilitate adaptation and central nervous system reorganization to regain control of balance and decrease dizziness.

- Demonstrate interventions for a simulated client with balance and/or vestibular disorders.
- Document a treatment intervention that utilized balance and vestibular interventions.
- Identify common medications used with balance and vestibular disorders.

9. Discuss various aspects of brain function aging and dementia.

- Define the basic terminology and discuss the prevalence of cognitive disturbances seen in older persons.
- Describe normative changes in brain function with normal aging and their relevance to the diagnosis of delirium and dementias.
- Describe normal sensory changes with aging and how they alter a person's overall ability to adapt to stress.
- Describe common sensory changes with dementia and implications for adapting physical therapy intervention to enhance patients' ability to perform at their highest functional level.
- Discuss common changes in learning styles with aging and implications for adapting physical therapy assessments and intervention.
- Describe how the environmental design and ergonomics can enhance patient performance in activities of daily living and instrumental activities of daily living.
- Describe sample strategies for modifying assessment and treatment procedures with an individual with cognitive challenges.
- Discuss treatment skills that are helpful in working with persons who have irreversible dementia.
- Demonstrate appropriate interventions with a simulated client with a cognitive disorder, dementia or delirium.
- List common medications used with dementia, cognitive disorders and dementia.

10. Describe various psychosocial factors and their influences on the rehabilitation process.

- Identify psychosocial adjustment to chronic illness, impairments and disabilities.
- Identify various personality and coping styles and their effect on the rehabilitation process.
- Describe common defense reactions to disability.
- Identify the signs and symptoms of anxiety, acute and posttraumatic stress disorders, depression, substance abuse, agitation and violence and hypersexuality
- Describe the effects of anxiety, acute and posttraumatic stress disorders, depression, substance abuse, agitation and violence and hypersexuality have on the rehabilitation process.
- Identify how to make referrals for anxiety, acute and posttraumatic stress disorders, depression, substance abuse, agitation and violence and hypersexuality.
- Discuss the relevance and importance of the rehabilitation team members' self-awareness in the rehabilitation process.
- Discuss the physical therapist assistant's role on the treatment team in educating key caregivers and support personnel.