

## 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.

Number beside each objective refers to where the objective is assessed at. For example, 3.10 would mean test number 3 question number 10. SC=skill check, CD= class discussion

<b><u>COURSE NUMBER:</u></b>	PTA 102
<b><u>COURSE TITLE:</u></b>	PTA Kinesiology
<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>PREREQUISITES:</u></b>	Admission to the PTA Program
<b><u>REVISION DATE:</u></b>	3/8/18

**Course schedule:** Class Monday & Thursday 8:00-9:45, Lab Tue-12:30-4:00  
Contact hours: Class 37.5, Lab 37.5

### **COURSE DESCRIPTION:**

This course is designed to teach the physical therapist assistant students the concepts of kinesiology and biomechanics, joint structure and function, palpation, goniometry, manual muscle testing and gait analysis.

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

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

1. Develop an understanding for the basic principles of kinesiology, goniometry and manual muscle testing.
  - Define commonly used anatomic and kinesiologic terminology. 1.1-1.10
  - Describe the common movements of the body 1.0-1.10
  - Differentiate between osteokinematic and arthrokinematic movement 1.9
  - Describe the arthrokinematic principles of movement. 1.10, 1.11
  - Analyze the planes of motion and axes of rotation for common motions. 1.3, 1.12
  - Describe how force, torque and levers affect biomechanical movement. 1.14, 1.15

- Describe the three biomechanical lever systems and explain their advantages and disadvantages. 1.14, 1.15, XC, CD
- Analyze how muscular lines of pull produce specific biomechanical movements. 1.14, SC
- Explain how muscular force vectors are used to describe movement. SC, CD
- Describe the basic principles of goniometry and manual muscle testing. Sc, CD
- Discuss how to recognize normal and abnormal muscle length. SC, CD

## 2. Describe the basic structure and function of joints and skeletal muscle.

- Describe the components of the axial versus appendicular skeleton. SC, CD
- Describe the primary components found in bone. SC, CD
- Describe the five types of bones found in the human skeleton. SC, CD
- Describe the three primary classifications of joints. SC, CD
- Identify the components of a synovial joint. SC, CD
- Describe the three primary materials found in connective tissue. SC, CD
- Explain how tendons and ligaments support the structure of a joint. SC, CD
- Explain how muscles help to stabilize a joint. SC, CD
- Describe the effects of immobilization on the connective tissues of a joint. 1.13
- Describe concentric, eccentric and isometric activation of muscle. 1.23
- Identify the anatomic components that comprise a whole muscle. 1.19
- Describe the sliding filament theory. CD, 1.20, 1.21
- Describe how cross-sectional area, line of pull and shape help determine the functional potential of a muscle. 1.20
- Describe the active length-tension relationship of muscle. 1.23
- Describe the passive length-tension relationship of muscle. 1.23
- Explain why the force production of a multi-articular muscle is particularly affected by is operational length. 1.25
- Describe the principles of stretching muscular tissue. SC, CD
- Describe the basic principles of strengthening muscular tissue. SC, CD

## 3. Describe the structure and function of the vertebral column, the hip, the knee and the ankle and foot complex.

- Identify the normal curvatures of the vertebral column and explain how these curves provide spinal stability. 2.1, 2.2
- Identify the bones and bony features of the vertebral column and cranium. 2.3-2.6
- Describe the ligaments and soft tissues of the vertebral column and important features of an intervertebral disc. 2.7, 2.44, SC, CD
- Describe the unique features of the cervical, thoracic, lumbar and sacral vertebrae. 2.1-2.8, 2.40, 2.41, 2.43
- Cite the normal ranges of motion allowed for all regions and motions of the vertebral column. 1.32-1.35
- Explain how the orientation of the facet joints helps determine the primary movements of the various regions of the vertebral column. 1.17, 2.17, SC, CD
- Describe the motions of the spine on the intervertebral disc. CD
- Justify the actions of the muscles of the spine. 2.21-2.26

- Identify the bones and bony structures of the hip and pelvis. 3.16, 3.17
- Describe the supporting structures of the hip joint. 3.9
- Cite the normal ranges of motion for hip movements. SC, CD
- Describe the planes of motions and axes of rotation for all motions of the hip. 3.11
- Justify the actions of the hip muscles through knowledge of the muscle's proximal and distal attachments. 3.12, 3.13, 3.27-3.35
- Identify the bones and primary bony features of the knee. SC, CD
- Describe the primary supporting structures of the knee. 3.1-3.3
- Describe the planes of motion and axes of rotation for the motions of the knee. SC, CD
- Cite the proximal and distal attachments of the muscles of the knee. 3.5, SC, CD
- List the innervations of the muscles of the knee. 3.32, SC, CD
- Justify the primary actions of the muscles of the knee. SC, CD
- Cite normal ranges of motion for knee movements. SC, CD
- Identify the primary bones and bony features of the ankle and foot. 3.45, 3.58
- Describe the connective tissues of the ankle and foot. 3.47, 3.62
- Describe the primary motions of the foot and ankle. 3.44, 3.60
- Describe the planes of motion and axes of rotation for the movements of the ankle and foot. 3.48
- Justify the actions of the muscles of the ankle and foot through knowledge of their proximal and distal attachments. 3.69, 3.75-3.77, 3.85
- Cite the innervations of the muscles of the ankle and foot. 3.55, 3.82
- Cite normal ranges of motion for the ankle and foot complex. SC, CD
- Perform manual muscle testing for the spine and lower extremity. SC, CD
- Measures functional range of motion of the spine and lower extremities. SC, CD
- Measures range of motion of the spine and lower extremities using a goniometer. SC, CD
- Develop and demonstrate an exercise program that will address ROM, Stretching, and strengthening. SC, CD

<p>4. Describe the structure and function of the shoulder complex, elbow and forearm complex and the wrist and hand complex.</p>
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- Identify the bones and primary bony features relevant to the shoulder complex. 4.1-4.4
- Describe the location and primary function of the ligaments that support the joints of the shoulder complex. SC, CD
- Cite the normal ranges of motion for shoulder movements. SC, CD
- Describe the planes of motion and axes of rotation for the primary motions of the shoulder. SC, CD
- Cite the proximal and distal attachments, actions and innervations of the muscles of the shoulder complex. 5.33-5.36
- Describe the muscular interactions involved with active shoulder movement patterns. 5.16, 5.18
- Identify the primary bones and bony features relevant to the elbow and forearm complex. 5.23
- Describe the supporting structures of the elbow and forearm complex. 5.19, 5.25, 5.28

- Describe the structure and function of the four main joints within the elbow and forearm complex. 5.56
- Cite the normal range of motion for the elbow and forearm joints. 5.22, SC, CD
- Describe the planes of motion and axes of rotation for the joints of the elbow and forearm complex. SC, CD
- Cite the proximal and distal attachments and innervations of the muscles of the elbow and forearm complex. 5.37-5.40
- Justify the primary actions of the muscles of the elbow and forearm complex. SC, CD
- Identify the bones and primary bony features relevant to the wrist complex. 5.44-5.46, SC, CD
- Describe the supporting structures of the wrist. 5.53
- Cite the normal ranges of motion for wrist movements. SC, CD
- Describe the planes of motion and axes of rotation for the joints of the wrist. SC, CD
- Cite the proximal and distal attachments and innervations of the primary muscles of the wrist. SC, CD
- Justify the primary actions of the muscles of the wrist. 5.57
- Identify the bones and primary bony features of the hand.
- Identify the carpometacarpal, proximal interphalangeal and distal interphalangeal joints of the hand. SC, CD
- Describe the supporting structures of the hand. SC, CD
- Describe the planes of motion and axes of rotation for the motions of the hand. SC, CD
- Cite the proximal and distal attachments as well as the innervations of the muscles of the hand. 5.40, 5.41, SC, CD
- Justify the primary actions of the muscles of the hand. 5.57, SC, CD
- Perform Manual muscle testing for the upper extremity. SC, CD
- Measures functional range of motion of the upper extremities. SC, CD
- Measures range of motion of the upper extremities using a goniometer.
- Develop and demonstrate an exercise program that will address ROM, Stretching, and strengthening. SC, CD

#### 5. Describe normal kinesiology of human gait.

- Describe the primary events of the gait cycle. 6.1-6.3
- Define the common terms used to describe human gait. 6.1-6.5
- Describe the muscular and joint interactions that occur during the primary events of the gait cycle. 6.10
- Describe common gait deviations including impairments that may cause the deviations. 6.17-6.21, 6.26

#### 6. Describe the kinesiology of mastication and ventilation.

- Identify the bones and bony features relevant to the temporomandibular joint (TMJ). SC, CD
- Describe the capsule and ligament that supports the TMJ. SC, CD
- Identify the motions that occur at the TMJ. SC, CD
- Describe the muscular and joint interactions involved in movements of the TMJ. SC, CD

- Justify the actions and the primary muscles of the TMJ through knowledge of the muscles' proximal and distal attachments. SC, CD
- Cite the primary muscles of ventilation. SC, CD
- Describe normal chest wall excursion during ventilation. SC, CD

7. Describe and analyze normal posture.

- Describe the development of postural curves. 1.44
- Describe normal standing, supine and sitting posture. 1.45
- Identify abnormal posture and describe its effect on other structures of the body. 1.46