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.

COURSE NUMBER: PTA 102

COURSE TITLE: PTA KINESIOLOGY

SEMESTER CREDIT HOURS: 3 (37.5 Contact Hours; 18 didactic/19.5 lab)

DEPARTMENT: Health Science

DIVISION: Career Technical Education

PREREQUISITE: Acceptance to the PTA Program

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.
- Describe the common movements of the body
- Differentiate between osteokinematic and arthrokinematic movement,
- Describe the arthrokinematic principles of movement.
- Analyze the planes of motion and axes of rotation for common motions.
- Describe how force, torque and levers affect biomechanical movement.
- Describe the three biomechanical lever systems and explain their advantages and disadvantages.
- Analyze how muscular lines of pull produce specific biomechanical movements.
- Explain how muscular force vectors are used to describe movement.
- Describe the basic principles of goniometry and manual muscle testing.

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

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

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.
- Identify the bones and bony features of the vertebral column and cranium.
- Describe the ligaments and soft tissues of the vertebral column and important features of an intervertebral disc.
- Describe the unique features of the cervical, thoracic, lumbar and sacral vertebrae.
- Cite the normal ranges of motion allowed for all regions and motions of the vertebral column.
- Explain how the orientation of the facet joints helps determine the primary movements of the various regions of the vertebral column.
- Describe the motions of the spine on the intervertebral disc.
- Justify the actions of the muscles of the spine.
- Identify the bones and bony structures of the hip and pelvis.
- Describe the supporting structures of the hip joint.
- Cite the normal ranges of motion for hip movements.
- Describe three kinematic strategies used to produce different functional motions at the hip.
- Describe the planes of motions and axes of rotation for all motions of the hip.

- Justify the actions of the hip muscles through knowledge of the muscle's proximal and distal attachments.
- Identify the bones and primary bony features of the knee.
- Describe the primary supporting structures of the knee.
- Describe the planes of motion and axes of rotation for the motions of the knee.
- Cite the proximal and distal attachments of the muscles of the knee.
- List the innervations of the muscles of the knee.
- Justify the primary actions of the muscles of the knee.
- Cite normal ranges of motion for knee movements.
- Identify the primary bones and bony features of the ankle and foot.
- Describe the connective tissues of the ankle and foot.
- Describe the primary motions of the foot and ankle.
- Describe the planes of motion and axes of rotation for the movements of the ankle and foot.
- Justify the actions of the muscles of the ankle and foot through knowledge of their proximal and distal attachments.
- Cite the innervations of the muscles of the ankle and foot.
- Cite normal ranges of motion for the ankle and foot complex.
- Perform manual muscle testing for the spine and lower extremity.
- Measures functional range of motion of the spine and lower extremities.
- Measures range of motion of the spine and lower extremities using a goniometer.

4. Describe the structure and function of the shoulder complex, elbow and forearm complex and the wrist and hand complex.

- Identify the bones and primary bony features relevant to the shoulder complex.
- Describe the location and primary function of the ligaments that support the joints of the shoulder complex.
- Cite the normal ranges of motion for shoulder movements.
- Describe the planes of motion and axes of rotation for the primary motions of the shoulder.
- Cite the proximal and distal attachments, actions and innervations of the muscles of the shoulder complex.
- Describe the muscular interactions involved with active shoulder movement patterns.
- Indentify the primary bones and bony features relevant to the elbow and forearm complex.
- Describe the supporting structures of the elbow and forearm complex.
- Describe the structure and function of the four main joints within the elbow and forearm complex.
- Cite the normal range of motion for the elbow and forearm joints.
- Describe the planes of motion and axes of rotation for the joints of the elbow and forearm complex.
- Cite the proximal and distal attachments and innervations of the muscles of the elbow and forearm complex.
- Justify the primary actions of the muscles of the elbow and forearm complex.

- Identify the bones and primary bony features relevant to the wrist complex.
- Describe the supporting structures of the wrist.
- Cite the normal ranges of motion for wrist movements.
- Describe the planes of motion and axes of rotation for the joints of the wrist.
- Cite the proximal and distal attachments and innervations of the primary muscles of the wrist.
- Justify the primary actions of the muscles of the wrist.
- Describe how the compressive forces are transferred from the hand through the wrist.
- Identify the bones and primary bony features of the hand.
- Identify the carpometacarpal, proximal interphalangeal and distal interphalangeal joints of the hand.
- Describe the supporting structures of the hand.
- Describe the planes of motion and axes of rotation for the motions of the hand.
- Cite the proximal and distal attachments as well as the innervations of the muscles of the hand.
- Justify the primary actions of the muscles of the hand.
- Perform Manual muscle testing for the upper extremity.
- Measures functional range of motion of the upper extremities.
- Measures range of motion of the upper extremities using a goniometer.

5. Describe normal kinesiology of human gait.

- Describe the primary events of the gait cycle.
- Define the common terms used to describe human gait.
- Describe the muscular and joint interactions that occur during the primary events of the gait cycle.
- Describe common gait deviations including impairments that may cause the deviations.

6. Describe the kinesiology of mastication and ventilation.

- Identify the bones and bony features relevant to the tempromandibular joint (TMJ).
- Describe the capsule and ligament that supports the TMJ.
- Identify the motions that occur at the TMJ.
- Describe the muscular and joint interactions involved in movements of the TMJ.
- Justify the actions and the primary muscles of the TMJ through knowledge of the muscles' proximal and distal attachments.
- Cite the primary muscles of ventilation.
- Describe normal chest wall excursion during ventilation.

7. Describe and analyze normal posture.

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