

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.

<u>COURSE NUMBER:</u>	PTA 202
<u>COURSE TITLE:</u>	PTA MUSCULOSKELETAL
<u>SEMESTER CREDIT HOURS:</u>	5
<u>DEPARTMENT:</u>	Health Science
<u>DIVISION:</u>	Career Technical Education
<u>PREREQUISITE:</u>	Admission to PTA Program
<u>REVISION DATE:</u>	January, 2011

COURSE DESCRIPTION:

This course is designed to train the student to provide physical therapy, under the direction of a physical therapist, to clients with a variety of musculoskeletal disorders. Emphasis is on critical thinking and the PTA's role in the physical assessment of the orthopedic conditions.

COURSE OUTCOMES AND COMPETENCIES:

Students who successfully complete this course will be able to:

1. Discuss patient supervision and observation during treatment and the role of the PTA and physical assessment.
 - Discuss the 'Problem Solving Algorithm utilized by PTAs in Patient/Client Intervention'.
 - Identify and discuss the rationale for clear and concise communication among all members of the rehabilitation team.
 - Discuss the skills necessary to provide patient supervision.
 - Define objective scales of measurement used to communicate changes in a patient's status to the supervising physical therapist.
 - Apply proactive listening skills and objective scales of measurement to provide appropriate, accountable and responsible observation and supervision of the patient during treatment.
 - Define open-ended and closed-ended questioning.
 - Define the quadrants of the basic dimensional model.

- Discuss the four categories of behavior of the physical therapist assistant: dominance, submission, hostility and warmth.
- Describe the differences between prompting and cueing.
- Apply the language of the *Guide to Physical Therapist Practice* to physical assessment procedures.
- Identify the common elements of examination, evaluation and assessment.
- Describe the role of the physical therapist assistant in the performance of physical assessment based on the physical therapy plan of care.
- Discuss the role of the physical therapist assistant in discharge planning as directed by the supervising physical therapist.
- Discuss the role of the physical therapist assistant in educating patients and caregivers as directed by the supervising physical therapist.
- Discuss the role of the physical therapist assistant in providing patient-related instruction to patients, family members and caregivers to achieve patient outcomes based on the plan of care established by the physical therapist.
- Under the direction and supervision of the physical therapist, instructs other members of the health care community.
- Discuss the role of the physical therapist assistant in data collection.
- Explain methods of modifying the physical therapy plan of care or action to be taken in response to physical assessment of the patient.
- Identify critical elements to include with documentation of physical assessment.
- Relate physical assessment to goals and outcomes of the physical therapy plan of care.
- Describes aspects of organizational planning and operation of the physical therapy service.
- List performance improvement activities typically used by hospitals and clinics.

<p>2. Discuss various aspects of flexibility, stretching, strength, endurance, balance and coordination.</p>

- Describe viscoelasticity and the properties associated with collagen.
- Explain the stress-strain curve and factors that influence change.
- Discuss Golgi tendon organs (GTOs) and muscle spindles.
- Discuss how temperature affects connective tissue.
- Define and discuss range of motion, flexibility and stretching.
- Outline various methods used to measure flexibility.
- Identify and describe various stretching techniques.
- Discuss precautions and essential components of stretching program development.
- Discuss at least two proposed benefits of stretching.
- Explain how stretching might negatively impact activity performance.
- Describe the clinical applications for stretching soft-tissue contractures.
- Describe and contrast the differences and similarities between scar tissue and adhesions.
- Name the noncontractile and contractile elements of muscle tissue.
- Give examples of concentric and eccentric contractions.
- State two definitions of strength.
- List methods used to measure strength.

- Compare muscle contraction types related to tension produced and energy liberated.
- Identify features of delayed onset muscle soreness (DOMS).
- List three clinically relevant exercise programs to enhance strength.
- Explain opened and closed kinetic chain exercises.
- Identify goals and applications of strength training programs for the elderly.
- Recognize the difference between muscular and cardiovascular endurance.
- Define activities/exercises that are aerobic and anaerobic.
- Describe benefits associated with cardiovascular fitness training.
- Compare moderate- and vigorous-intensity exercises.
- Describe methods to measure exercise intensity.
- Describe the role of aerobic exercise for patients with an orthopedic injury.
- Define the training parameters to improve muscular endurance.
- Define and contrast balance and coordination.
- Discuss the mechanoreceptor system and define four mechanoreceptors.
- List static and dynamic balance and coordination tests and activities.
- Define proprioception and kinesthetic awareness.
- Discuss several factors that contribute to balance dysfunction.
- Identify functional closed kinetic chain proprioceptive exercises.
- Discuss the rationale for proprioceptive training for the upper extremity.

3. Discuss various aspects of connective tissue.

- Outline components of connective tissue.
- Discuss the sequence of overlapping events of inflammation.
- Define fibroplasias.
- Identify the sources of coagulation.
- Describe and discuss the various cells of inflammation and their function.
- Discuss the molecular cascade of arachidonic acid metabolic pathways of lipoygenase and cyclooxygenase.
- Define cytokines and growth factors and discuss their various functions.
- Define and discuss the inflammatory response to injury.
- Describe the phases of healing and sequence of events characteristics of each phase.
- Identify the five cardinal signs of inflammation.
- Describe the effects of immobilization on ligaments.
- Identify and discuss practical clinical applications of stress deprivation and protected motion during phases of ligament healing.
- Identify and describe the phases of bone healing.
- Describe the objectives that serve as the foundation of fracture management and bone healing.
- Define osteoblasts, osteoclasts and osteocytes.
- Define and discuss Wolff's law.
- Discuss stress deprivation, immobilization and normal physiological stress as they apply to fracture healing.
- Define three complications of bone healing.
- Outline and describe six areas of descriptive organization of classifying fractures.

- Describe the five types of pediatric fractures defined by Salter-Harris.
- Define pathological fractures and list four types.
- Discuss how osteoporosis affects fractures.
- Define osteomalacia.
- List common methods of fracture fixation, fixation devices and fracture classifications.
- Discuss clinical applications of rehabilitation techniques used during bone healing.
- Discuss the composition and function of articular cartilage.
- Identify common causes of injury to articular cartilage.
- Describe the sequence of healing and the extent of intrinsic repair of articular cartilage.
- Define invasive and noninvasive techniques of stimulating articular cartilage repair.
- Define and describe the composition and function of fibrocartilage.
- Identify and discuss common mechanisms of injury to fibrocartilage.
- Describe the mechanisms of intrinsic healing of the meniscus.
- Recognize the macrostructure and microstructure of muscle and tendon.
- Describe the two main types of muscle fibers.
- Describe the three mechanisms for a muscle injury.
- Describe the injury mechanism's associated tendon pathology.
- Name the functional unit of a tendon and its structural significance.
- Describe the difference between a supraphysiologic and subfailure load and how each type may contribute to an injury.
- Define how a muscle strain differs from a ligament strain.
- Describe the difference between a tendonitis and a tendinopathy.
- Describe the effects of aging on tendons.
- Name and describe the three phases of connective tissue healing.
- Describe the effects of immobilization on connective tissue.
- Discuss clinical applications of therapeutic interventions based on the stages of connective tissue healing.
- Identify neural anatomy.
- Discuss the vascular supply to nerve tissue.
- Understand the mechanical behavior of nerve tissue.
- Identify the causes and classification of nerve injury.
- Discuss intrinsic nerve healing.
- Describe methods of surgical repair of nerve injury.
- Identify the structure and composition of vascular tissue.
- Discuss the vascular response to injury.
- Explain the various signs and symptoms of vascular injury.
- Discuss the pathophysiology of thromboembolic disease.
- Recognize the risk factors of deep vein thrombosis and pulmonary emboli.

4. Discuss orthopedic pharmacology.

- Discuss pharmacokinetic concepts, including absorption, distribution, metabolism, excretion half-life and duration of action and their relationship and significance to rehabilitation therapies.

- Discuss pharmacodynamic concepts including dose-response relationship, therapeutic window, adverse drug reactions, toxicity, tolerance, withdrawal and addiction.
- List the general principles of safe medication use and the physical therapist assistant's role in optimizing patient safety.
- Discuss general principles of treatment and prevention of orthopedic infection including why such infections are difficult to treat and importance of antibiotic compliance.
- Discuss the analgesics best suited for different types of pain.
- Discuss how opioids work differently than anti-inflammatory analgesics in the treatment of pain.
- Discuss common side effects and precautions associated with opioids, acetaminophen, nonsteroidal anti-inflammatory drugs, cyclooxygenase-2 inhibitors and corticosteroids.
- Discuss the risk of acetaminophen overdoses during pain management.

5. Discuss the biomechanical basis for movement.

- Define and describe the basic components of the gait cycle.
- Discuss the two phases of gait.
- Identify and describe each component of the two phases of gait.
- Define and describe common gait deviations.
- Define and instruct appropriate gait patterns.
- Outline and describe terms used to define weight-bearing status during gait.
- Identify and discuss the appropriate use of assistive devices.
- Discuss the general and applied concept of peripheral joint mobilization.
- Define terms and principles of peripheral joint mobilization.
- Define and describe the convex-concave rule.
- Define the five grades of mobilization.
- Identify and describe terms of joint end-feel.
- Define and describe capsular and noncapsular patterns.
- Identify common indications and contraindications for mobilization.
- Discuss the clinical basics and applications of peripheral joint mobilization.
- Identify and discuss the role of the physical therapist assistant in assisting the physical therapist with the delivery of peripheral joint mobilization.
- Define and apply biomechanical concepts in the description of rudimentary movement patterns.
- Discuss the difference between kinematics and kinetics of movement.
- Identify and discuss the kinematic principles as related to movement in a rehabilitation setting.
- Discuss both the linear and angular kinematics of movement and explain how angular motion translates to linear movement.
- Describe the differences among the different levers and explain the concept of mechanical advantage as related to levers.
- Describe Newton's laws of motion.
- Identify and discuss the different forces that act on objects and how the forces affect movement.

- Discuss the concepts of mechanical loading and describe how loading is associated with different types of injuries.
- Discuss the principles of mechanical energy.
- Describe the concept of equilibrium and identify the factors that contribute to stability.

6. Describe and discuss the orthopedic management of the lower extremity and upper extremity.

- Identify common foot and ankle ligament injuries.
- Describe intervention methods for common foot and ankle ligament injuries.
- Identify and describe common lower leg, ankle and foot tendon injuries.
- Outline and describe common methods of intervention for lower leg, ankle and foot injuries.
- Identify common foot and ankle fractures.
- Discuss common methods of intervention for foot and ankle fractures.
- Identify and describe common methods of intervention for toe injuries.
- Describe common mobilization techniques for the ankle, foot and toe.
- Identify common ligament injuries of the knee.
- Discuss general methods of management and rehabilitation of common ligament injuries of the knee.
- Identify and describe common meniscal injuries of the knee.
- Discuss common methods of management and rehabilitation of meniscal injuries of the knee.
- Discuss surgical and postoperative management of articular cartilage injuries.
- Describe common methods of management and rehabilitation of patellofemoral disease of the knee.
- Identify and describe common patella, supracondylar femur and proximal tibia fractures.
- Describe common methods of management and rehabilitation of fractures around the knee.
- Identify and describe methods of management and rehabilitation after knee arthroplasty and high tibia osteotomy.
- Describe common mobilization techniques for the knee.
- Identify common hip fractures.
- Outline and discuss common methods of management and rehabilitation of ordinary hip fractures.
- Identify and describe common methods of management and rehabilitation after hip arthroplasty.
- Identify and describe common soft-tissue injuries of the hip.
- Outline and describe common methods of management and rehabilitation of soft-tissue injuries of the hip.
- Identify common fractures of the pelvis and hip.
- Discuss methods of management and rehabilitation for fractures of the pelvis and acetabulum.
- Describe common mobilization techniques for the hip.

- Identify and describe methods, management and rehabilitation for subacromial rotator cuff impingement.
- Identify and describe methods of management and rehabilitation for tears of the rotator cuff.
- Describe methods of management and rehabilitation for glenohumeral instability.
- Discuss methods of management and rehabilitation for adhesive capsulitis.
- Identify and describe common injuries of the acromioclavicular joint.
- Describe common methods of management and rehabilitation of injuries of the acromioclavicular joint.
- Identify and describe common fractures of the scapula, clavicle and proximal humerus.
- Outline and describe methods of management and rehabilitation of fractures around the shoulder.
- Describe methods of management and rehabilitation of fractures around the shoulder.
- Describe methods of management and rehabilitation after shoulder arthroplasty.
- Describe common manual exercise techniques for the shoulder.
- Identify and describe the principles for common overuse and soft-tissue injuries of the elbow.
- Discuss common methods of management and rehabilitation of overuse, soft-tissue injuries of the elbow.
- Identify and describe intercondylar fractures, radial head fractures, olecranon fractures and fracture-dislocations of the elbow.
- Describe methods of management and rehabilitation of various fractures and fracture-dislocations of the elbow.
- Describe techniques to improve range of motion of a stiff elbow including common joint mobilization techniques.
- Identify and describe common compression neuropathy of the wrist.
- Discuss methods of management and rehabilitation of compression neuropathy of the wrist.
- Identify and describe common ligament injuries of the wrist.
- Describe and discuss methods of management and rehabilitation of ligament injuries of the wrist.
- Describe methods of management and rehabilitation for distal radial and ulnar fractures.
- Identify methods of management and rehabilitation for scaphoid fractures.
- Identify and describe common metacarpal and phalanx fractures and methods of management and rehabilitation.
- Describe methods of management and rehabilitation following surgery for Dupuytren's disease.
- Identify and describe common extensor and flexor tendon injuries.
- Discuss methods of management and rehabilitation for extensor tendon and flexor tendon injuries.
- Identify methods of management and rehabilitation for complex regional pain syndrome.

7. Describe and discuss the orthopedic management of the lumbar, thoracic and cervical spine.

- Outline and describe basic mechanics of the lumbar spine.

- Discuss and apply the principles of fundamental mechanics of lifting.
- Identify common sprains and strains of the lumbar spine.
- Discuss common methods of management and rehabilitation of lumbar spine sprains and strains.
- Identify and describe injuries to the lumbar intervertebral disc.
- Define and describe methods of quantifying back strength.
- Define and describe components of the back school model.
- Define ergonomic and functional capacity evaluations.
- Define spinal stenosis and describe methods of management and rehabilitation.
- Define and contrast the terms spondylolysis and spondylolisthesis.
- Describe methods of management and rehabilitation for spondylolysis and spondylolisthesis.
- Identify common lumbar and thoracic spine fractures.
- Define kyphosis, lordosis and scoliosis.
- Identify and describe methods of management and rehabilitation for kyphosis and scoliosis.
- Identify and describe common cervical spine injuries and discuss methods of management and rehabilitation.

8. Discuss various aspects of rheumatic disorders.

- Identify causes of arthritis.
- Discuss different types of arthritis.
- Discuss similarities and differences for osteoarthritis and rheumatoid arthritis.
- Discuss the effects and benefits of exercise with arthritis.
- Discuss common methods of management and rehabilitation for arthritic conditions.
- Discuss principles of joint protection.
- Discuss general pharmacologic interventions for arthritic conditions.
- Discuss the different surgical options for arthritic conditions.
- Discuss pathophysiology and management of rheumatic disorders.

9. Discuss various aspects of pain and pain management.

- Define the different types of pain.
- Provide clinical implications for physical therapy regarding the different types of pain.
- Describe the components and mechanisms of pain reception and transmission.
- Explain the role of the sympathetic nervous system and substance P in pain reception and modulation.
- Describe the theories associated with pain modulation and control.
- Outline various clinical methods to measure and document pain perception.
- Explain the role of physical agents in managing a patient's pain.
- Describe the purpose and components of a multidisciplinary treatment program for pain management.

10. Discuss the basics of orthotics and prosthetics.

- Define the terms orthotics and prosthetics.
- Obtain basic understanding of materials.
- Learn the nomenclature-the naming of orthoses and prostheses in relation to the joint they support or replace.
- Describe the key differences when off-the-shelf orthoses can be chosen instead of custom fabricated.
- Have a general understanding of orthotic options for supporting major joints in the body.
- List levels of amputation sites as well as the reasons for amputation.
- Develop an understanding of the basic prosthetic componentry and how the selection of componentry relates to patient function and outcome.
- Instruct a simulated patient and/or caregiver in the use of and safety with orthotics and prosthetics including skin checks.