

# Course Competency

## PHT 2120 APPLIED KINESIOLOGY

### Course Description

Anatomical structures and movement as related to physical therapy procedures. Recognition and understanding of biomechanics of all human motion as related to the function of the musculoskeletal system during therapeutic exercise and gait training is discussed.

Course Competency	Learning Outcomes
<p><b>Competency 1:</b>The student will have an understanding of terms associated with biomechanical principles and musculoskeletal function and assessment tools by:</p>	<ol style="list-style-type: none"> <li>1. Communication</li> <li>2. Numbers / Data</li> <li>3. Critical thinking</li> <li>4. Social Responsibility</li> <li>5. Ethical Issues</li> <li>6. Computer / Technology Usage</li> </ol>
<ol style="list-style-type: none"> <li>1. Defining the anatomical position</li> <li>2. Describing and giving examples of the three classes of levers</li> <li>3. Defining planes, axes of movement and degrees of freedom as they relate to each joint</li> <li>4. Describing the elementary principles of joint design</li> <li>5. Describing the terms the composition and resolution of forces</li> <li>6. Identifying and defining the three main classifications of joints and give examples of each</li> <li>7. Identifying the five features common to all diarthrodial joints</li> <li>8. Comparing a closed kinematic chain with an open kinematic chain</li> <li>9. Comparing close-packed/open- packed positions of a given joint</li> <li>10. Identifying examples of connective tissue</li> <li>11. Differentiating between phasic and tonic muscle contraction</li> <li>12. Differentiating between isometric,</li> </ol>	

<p>isotonic, and Isokinetic muscle contraction</p> <ol style="list-style-type: none"> <li>13. Defining the length- tension relationship in muscle</li> <li>14. Defining positive and negative work</li> <li>15. Describing the influence of speed of contraction on tension</li> <li>16. Defining torque</li> <li>17. Differentiating between aerobic vs. anaerobic metabolism</li> <li>18. Defining agonist, antagonist, synergists and co- contractors, and force couples</li> <li>19. Describing the purpose of goniometric measurement</li> <li>20. Identifying fulcrum, proximal arm alignment, distal arm alignment and reference points</li> <li>21. Describing the importance of stabilization</li> <li>22. Defining stability and validity as they relate to goniometric measurement</li> <li>23. Documenting the ROM measurement at a specified joint</li> <li>24. Defining the muscle grades</li> <li>25. Describing the purpose(s) of manual muscle testing</li> <li>26. Describing the importance of positioning in testing the strength of the extremities and trunk</li> </ol>	
<p><b>Competency 2:</b>The student will have an understanding of The Hip Region by:</p>	
<ol style="list-style-type: none"> <li>1. Listing the joints that make up the hip joint and name their articulating surfaces</li> <li>2. Describing the motions available at the hip joint</li> <li>3. Identifying the major ligaments associated with the hip joint</li> <li>4. Naming origin, insertion, action and nerve supply of the major muscles of the hip joint</li> <li>5. Describing the planes and accompanying motions at the lumbar spine and hip joints for the following pelvic motions: pelvic rotation, anterior / posterior pelvic tilting, and lateral tilting of the pelvis</li> <li>6. Describing the procedure and alignment</li> </ol>	

<p>for measuring ROM of the hip joint</p> <ol style="list-style-type: none"> <li>7. Describing the procedure and grading for manual muscle testing of the major muscle groups of the hip joint</li> <li>8. Describing the purpose and procedures of tests that pertain to the anatomy and pathological conditions of the hip joint</li> <li>9. Defining lumbar – pelvic rhythm</li> <li>10. Describing the position of greatest stability at the hip during erect bilateral stance</li> <li>11. Describing the role of the gluteus medius during unilateral stance</li> </ol>	
<p><b>Competency 3:</b>The student will have an understanding of the Knee Region by:</p>	
<ol style="list-style-type: none"> <li>1. Listing the joints and articulations within the knee complex</li> <li>2. Defining the function and structure of the menisci and ligaments in the knee complex</li> <li>3. Identifying the major bursae found at the knee complex</li> <li>4. Describing the motions available at the knee joint including the locking and unlocking of the knee when the femur is fixed and when the femur is free</li> <li>5. Naming origin, insertion, action and nerve supply of the major muscles of the knee joint</li> <li>6. Describing the procedure and alignment for measuring ROM of the Knee complex</li> <li>7. Describing the procedure and grading for manual muscle testing of the major muscle groups of the knee joint</li> <li>8. Describing the purpose and procedures of tests that pertain to the anatomy and pathological conditions of the knee joint and region</li> </ol>	
<p><b>Competency 4:</b>The student will demonstrate an understanding of the Ankle and Foot Region by:</p>	
<ol style="list-style-type: none"> <li>1. Listing the joints and articulations in the ankle-foot complex</li> <li>2. Describing the motions available at the joints of the ankle-foot complex</li> </ol>	

3. Identifying the ligaments that support the joints of the ankle and foot
4. For the major muscle groups, naming the origin, insertion, action and nerve supply
5. Describing the procedure and alignment for measuring ROM of the ankle foot complex
6. Describing the procedure and grading for manual muscle testing of the major muscle groups of the ankle- foot complex
7. Describing the purpose and procedures of tests that pertain to the anatomy and pathological conditions of the ankle-foot region
8. Defining the primary role of the intrinsic musculature of the foot
9. Describing the function and location of the plantar arches

**Competency 5:** The student will demonstrate an understanding of the trunk and neck by:

1. Listing the joints that make up the vertebral column and name their articulation surfaces
2. The student will demonstrate an understanding of the shoulder region by:
3. Describing the motions available at the vertebral column for each area
4. Describing the normal curves of the erect spine
5. Identifying the major ligaments associated with the spine
6. Defining intervertebral disc
7. Naming origin, insertion, action and nerve supply of the major muscles of the trunk
8. Describing the procedure and alignment for measuring ROM of the spine
9. Describing the procedure and grading for manual muscle testing of the major muscle groups of the trunk
10. Describing the purpose and procedure for tests that pertain to the anatomy and pathological conditions of the spine and trunk
11. Listing the joints that make up the

<p>vertebral column and name their articulation surfaces</p> <ol style="list-style-type: none"> <li>12. Describing the motions available at the vertebral column for each area</li> <li>13. Describing the normal curves of the erect spine</li> <li>14. Identifying the major ligaments associated with the spine</li> <li>15. Defining intervertebral disc</li> <li>16. Naming origin, insertion, action and nerve supply of the major muscles of the trunk</li> <li>17. Describing the procedure and alignment for measuring ROM of the spine</li> <li>18. Describing the procedure and grading for manual muscle testing of the major muscle groups of the trunk</li> <li>19. Describing the purpose and procedure for tests that pertain to the anatomy and pathological conditions of the spine and trunk</li> </ol>	
<p><b>Competency 6:</b>The student will demonstrate an understanding of the shoulder region by:</p>	
<ol style="list-style-type: none"> <li>1. Listing the three structural (skeletal) components of the shoulder complex</li> <li>2. Listing the four independent joints of the shoulder complex and identifying their articulating surfaces</li> <li>3. Listing and defining the role of the major ligaments at each joint</li> <li>4. Describing the motions available at each joint of the shoulder complex and in which plane it takes place</li> <li>5. Defining scapulohumeral rhythm</li> <li>6. Identifying and describing the role of the rotator cuff</li> <li>7. Naming the origin, insertion, action and nerve supply of the major muscle groups of the shoulder complex</li> <li>8. Describing the procedure and alignment for measuring ROM of the shoulder complex movements</li> <li>9. Describing the procedure and grading for manual muscle testing of the major muscle groups of the shoulder complex</li> </ol>	

<p>10. Describing the purpose and procedures of tests that pertain to the anatomy and pathological conditions of the shoulder region</p>	
<p><b>Competency 7:</b>The student will have an understanding of the Elbow Complex by:</p>	
<ol style="list-style-type: none"> <li>1. Identifying the structural components of the elbow complex</li> <li>2. Identifying the articulating surfaces of the joints of the elbow complex</li> <li>3. Describing the motions available at the joints of the elbow complex</li> <li>4. Identifying the major ligaments associated with joints of the elbow complex</li> <li>5. Naming the origin, insertion, action and nerve supply of the major muscles of the elbow complex</li> <li>6. Describing the procedure and alignment for measuring ROM of the elbow complex movements</li> <li>7. Describing the procedure and grading for manual muscle testing of the major muscle groups of the elbow complex</li> <li>8. Describing the purpose and procedures of tests that pertain to the anatomy and pathological conditions of the shoulder region</li> </ol>	
<p><b>Competency 8:</b>The student will have an understanding of the Wrist and Hand by:</p>	
<ol style="list-style-type: none"> <li>1. Listing the two compound joints that make up the wrist complex and describe their articulation surfaces.</li> <li>2. Describing the motions available at the wrist complex.</li> <li>3. Identifying the structural components of the joints that make up the fingers and thumb.</li> <li>4. Describing the motions available at those joints.</li> <li>5. Naming the origin, insertion, action and nerve supply of the major muscles of the wrist and fingers.</li> </ol>	

<ol style="list-style-type: none"> <li>6. Identifying the major ligaments associated with joints of the wrist, fingers and thumbs.</li> <li>7. Differentiating between the extrinsic and intrinsic muscles of the hand.</li> <li>8. Defining prehension</li> <li>9. Describing the procedure and alignment for measuring ROM of the wrist and fingers.</li> <li>10. Describing the procedure and grading for manual muscle testing of the major muscle groups of the wrist and fingers.</li> <li>11. Describing the purpose and procedures of tests that pertain to the anatomy and pathological conditions of the wrist and fingers.</li> </ol>	
<p><b>Competency 9:</b>The student will have an understanding of Posture by:</p>	
<ol style="list-style-type: none"> <li>1. Defining posture</li> <li>2. Defining the center of gravity and base of support in normal posture</li> <li>3. Describing the normal curvatures of the erect spine</li> <li>4. Recognizing postural deviations with the use of plumb – line analysis</li> <li>5. Recognizing high/low shoulder and hips</li> <li>6. Defining apparent and true leg length discrepancies</li> <li>7. Describing commonly found deviations associated with posture</li> <li>8. Defining and giving examples of scoliosis</li> </ol>	
<p><b>Competency 10:</b>The student will have an understanding of Gait by:</p>	
<ol style="list-style-type: none"> <li>1. Describing a normal gait pattern</li> <li>2. Defining the phases of gait and types of muscle contractions occurring at each joint</li> <li>3. Stating minimal joint motions needed in lower extremities for normal gait</li> <li>4. Identifying major gait deviations and describe their most probable cause</li> <li>5. Discussing possible therapeutic measures in correction of gait deviation</li> </ol>	

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