Course Description
PTH 240 Therapeutic Exercises/Applications
5.0 (4.0 lecture and 1.0 lab) 60 Lecture Hours; 45 Laboratory Hours
Prerequisites: PTH 202, PTH 205, BIO 211, ENG 102
Co-Requisites: PTH 242, PTH 252

Course Focus
This course provides the practical application of therapeutic exercise, goniometry and manual muscle testing. The use of various therapeutic exercise and data collection techniques by the physical therapist assistant is presented and practiced within the context of the plan of care developed by a licensed physical therapist. Students practice concepts related to patient education, appropriate communication, and documentation of patient care activities.

Text and References

Course Objectives
At the completion of this course, students will:

General:
1. Read a research article that pertains to therapeutic exercise.
2. Prepare and present a summary of a research article published in a peer reviewed journal.
3. Complete all tests and measures in the APTA Adult Fitness Examination Workbook.
4. Apply knowledge of body mechanics, pain assessment, vital signs, and patient safety to therapeutic exercise strategies.
5. Educate others in therapeutic exercise programs.
Introduction to Exercise Principles
1. Describe the elements of the physical therapy patient management process.
2. Recognize the role of the PTA in patient assessment.
3. Define terms related to exercise and muscle function.
4. State basic principles related to therapeutic exercise.
5. State basic principles related to motor learning.
6. Apply basic principles related to motor learning to patient situations.
7. Relate physical therapy practice to models of disablement.
8. Distinguish between pathology, impairment, functional limitation, and disability.
9. Recognize contextual factors that may influence outcomes.
10. Compare the Nagi and ICF Models of Disablement.
11. Relate rehabilitation to functional outcomes.
12. Identify strategies to enhance patient compliance.
13. Recognize correct postural alignment.

Amputee Management
1. Describe the signs and symptoms associated with different stages of recovery from LE amputation.
2. Identify the major etiological factors leading to amputation surgery.
3. Compare and contrast different levels of amputations.
4. Explain the use of rigid dressings, semirigid dressings, soft dressings, and shrinkers used prior to prosthetic fitting.
5. Apply the principles of therapeutic exercise, positioning, pain management, and wound care to management of patients with LE amputations.
6. Demonstrate stump wrapping for AKA and BKA.
7. Instruct patients in postoperative therapeutic exercises.

Prosthetics and orthotics
1. Describe the major components of common prostheses and orthoses.
2. Relate different types of LE orthoses foot, ankle, knee, hip, and trunk control.
3. Explain the distinctive features of partial foot, Syme’s, and knee and hip disarticulation prostheses.
4. Summarize pre/post prosthetic and orthotic care, training, maintenance, and examination.
5. List the essential elements of an initial prosthetic/orthotic training program.

ROM
1. Differentiate between passive ROM exercise, active assistive ROM exercise, active ROM exercise, and active resistive ROM exercise.
2. Identify techniques used to perform self-ROM.
3. State normal ROM values for the joints of the upper and lower extremities.
4. Identify functional ROM for the joints of the upper and lower extremities.
5. Recognize patterns of substitution used to simulate increased ROM.
6. Identify normal joint end-feels.
7. State the goals of ROM exercises.
8. State contraindications to ROM exercises.*
9. Demonstrate PROM utilizing correct hand placement and body mechanics.
**Increasing Flexibility**
1. Define terms related to muscle flexibility.
2. Relate hypomobility to soft tissue shortening.
3. Explain the physiological responses to stretching exercises.
4. List the contraindications and precautions to muscle stretching.*
5. Revise age appropriate muscle stretching techniques
6. Evaluate various techniques used to increase muscle flexibility.
7. Demonstrate effective muscle stretching techniques utilizing correct hand placement and body mechanics.
8. Describe neural tension techniques for the sciatic, radial, medial, and ulnar nerves.
9. Effectively incorporate the use of cold and heat to a muscle stretching intervention.
10. Incorporate interventions to increase muscle flexibility into a physical therapy session as directed by the plan of care.

**Data Collection Techniques: Goniometry**
1. State the purpose of goniometry in physical therapy.
2. Explain the principles of goniometry.
3. Define reliability and validity with regards to assessment instruments.
4. State reliability values for the universal goniometer.
5. Identify techniques and practices used to increase reliability of goniometric measurements.
6. Demonstrate correct alignment the goniometer when measuring joint ROM.
7. Demonstrate effective stabilization techniques during goniometric measurements.
8. Accurately perform goniometric measurements of the shoulder, elbow, wrist, hip, knee and ankle.*
9. Correctly document the results of goniometry assessment.

**Data Collection Techniques: Manual Muscle Testing**
1. State the purpose of manual muscle testing in physical therapy.
2. Explain the principles of manual muscle testing.
3. Describe concepts related to the reliability and validity of manual muscle testing.
4. Define muscle test grades.
5. Demonstrate correct positioning and grading when performing manual muscle tests.
6. Demonstrate effective stabilization techniques when preforming manual muscle tests. .
7. Accurately perform manual muscle tests of the shoulder, elbow, wrist, hip, knee and ankle.*

**Principles of Resistance Training**
1. Define terms related to resistance training.
2. Explain basic concepts related to the force of muscle contraction.
3. Explain the clinical implications of slow twitch and fast twitch muscle fibers.
4. Explain physiological responses to resistance training.
5. Assess patient responses to resistance training.
6. Describe the effects of aging on muscle strength.
7. Apply basic physical principles related to the use of resistance training as a physical therapy intervention including stabilization, positioning, and posture.
8. Provide basic patient education related to resistance training.
9. Determine methods to progress resistance training programs.
13. State appropriate treatment parameters for different types of resistance exercise. 
14. Evaluate different equipment used for resistance training including elastic bands, free weights, and resistance machines. 
15. Demonstrate strengthening exercise techniques. 
16. Compare progressive resistance training protocols including Delorme, Oxford, and DAPRE. 
17. Identify contraindications and precautions to the use of resistance training.* 
18. Recognize issues pertaining to patient safety during resistance training. 
19. Incorporate interventions to increase muscle strength into a physical therapy session as directed by the plan of care.

**Balance Assessment and Exercise**
1. Define key terms related to balance. 
2. Assess balance using the Single Leg Stance, UE Functional Reach & LE Functional Reach Tests 
3. Recognize joint strategies used to maintain balance. 
4. Recognize balance impairments related to proprioceptive disorders. 
5. Describe exercise techniques used to treat proprioceptive balance impairments. 
6. Determine methods to progress balance training programs. 
7. Demonstrate patient monitoring during intervention activities related to balance training.* 
8. Incorporate interventions to improve balance into a physical therapy session as directed by the plan of care. 
9. Appropriately document balance to accurately reflect the provision of physical therapy intervention as directed by the plan of care.

**Aquatic Exercise**
1. Define terms related to the properties of water. 
2. Explain physiological responses to immersion in water. 
3. Apply the properties of water to therapeutic exercise techniques. 
4. List precautions and contraindications to aquatic exercise.* 
5. Incorporate the use aquatic therapy with stretching techniques. 
6. Incorporate the use of aquatic therapy with resistance training. 
7. Differentiate uses of different aquatic exercise equipment. 
8. State advantages and disadvantages of aquatic therapy. 
9. Recognize indications for aquatic therapy.

**Aerobic Conditioning and Re-Conditioning**
1. Define terms related to aerobic conditioning and re-conditioning. 
2. Differentiate between aerobic and anaerobic activities. 
3. Explain physiological and psychological responses to aerobic exercise programs. 
4. Describe physiological adaptations to aerobic conditioning. 
5. Assess patient reactions to aerobic exercise.* 
6. State the ACSM recommended activity level for adults and children. 
7. Employ recommended parameters of exercise related to the use of aerobic conditioning and re-conditioning. 
8. Recognize different levels of activity as defined by MET. 
10. State contraindications and precautions to the use of aerobic conditioning and re-conditioning exercises.*
11. Incorporate interventions to increase aerobic conditioning into a physical therapy sessions as directed by the plan of care.
12. Utilize select data collection measurements to correctly assess aerobic condition and response to exertion.

**Relaxation Exercises**
1. Describe different relaxation techniques.
2. Explain the theories of physiological relaxation responses.
3. Identify physical indicators of a relaxed state
4. Identify precautions to relaxation exercises*
5. Recognize modalities used to aid in muscle relaxation

**Student Contributions**
Each student is required to actively participate in laboratory sessions by practicing the application of various skills on fellow classmates. Appropriate and professional behavior is expected at all times in the laboratory setting. Shorts and a T-shirt are the required attire for all laboratory activities. A sweatshirt or sweatpants may be worn over these if such clothing does not interfere with the laboratory activities. Clothing must allow access to various parts of the body during specified laboratory activities.

**Course Schedule**
Lecture: 10:00 - 12:00 MWF
Lab: 8:00 - 9:30 MWF

**Graded Materials**
<table>
<thead>
<tr>
<th>Graded Material</th>
<th>Points</th>
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<tbody>
<tr>
<td>Midterm Exam</td>
<td>200</td>
</tr>
<tr>
<td>Cumulative Final Exam</td>
<td>300</td>
</tr>
<tr>
<td>Practical Exam</td>
<td>100</td>
</tr>
<tr>
<td>Article Review/Presentation</td>
<td>100</td>
</tr>
<tr>
<td>4 Exercise Programs (50 pts each)</td>
<td>200</td>
</tr>
<tr>
<td>Goniometry Skills Check</td>
<td>50</td>
</tr>
<tr>
<td>MMT Skills Check</td>
<td>50</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>1000</strong></td>
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**GRADING POLICY**

<table>
<thead>
<tr>
<th>Grading Scale</th>
<th>Grading Policy</th>
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<tbody>
<tr>
<td>90% - 100%</td>
<td>A</td>
</tr>
<tr>
<td>82% - 89%</td>
<td>B</td>
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<tr>
<td>75% - 81%</td>
<td>C</td>
</tr>
<tr>
<td>70% - 74%</td>
<td>D</td>
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<tr>
<td>Below 70%</td>
<td>F</td>
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<thead>
<tr>
<th>Grading Policy</th>
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<tbody>
<tr>
<td>W withdraw</td>
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<tr>
<td>WP withdraw with passing grade</td>
</tr>
<tr>
<td>WF withdraw with failing grade</td>
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<tr>
<td>I Incomplete</td>
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</tbody>
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**Grading Methodology.** The final grade must be 75.00% or more in order to pass the course and progress in the program. In addition, each student must pass the final exam with a grade of 75.00% or above. If a student fails the final exam a second attempt will be given. The highest score a student can achieve on the second attempt is 75% and the final grade will be a C. Students absent from an
examination or presentation will receive a “0” grade for the examination unless other arrangements are made with the individual instructor prior to the examination or presentation day or on the examination or presentation day before the test/presentation is scheduled to be given. It is the responsibility of the student to contact the appropriate instructor to arrange to make up the examination. Arrangements may be completed by telephone. If the instructor is not available, a message should be left on the instructor’s voice mail and with another member of the faculty or administrative assistant. The instructor will decide the time and method of make-up examinations on an individual basis. Messages sent by other students are unacceptable. The student is responsible for notifying the instructor of the reason for the absence. Grades are posted on Blackboard within one week of administration of tests and examinations.

Each student must demonstrate safety and competence in required laboratory skills. Students are responsible for insuring that laboratory skills are checked off by the instructor. The Laboratory Skills Achievement List for this course can be found at the back of this syllabus. All laboratory skills must be passed with a minimum score of 75% in order to pass the course. Students will be given three opportunities to pass the each skill check. In addition, the student must pass the practical exam (score 75% or greater) in order to pass the course. Should the student fail the practical exam, they will be given one opportunity to retake the exam. The highest possible score on retaking the exam is 75.00%. Non-compliance with a critical safety criterion will result in an automatic failure on skills checks as well as practical exams.

ADA STATEMENT
The Technical College of the Lowcountry provides access, equal opportunity and reasonable accommodation in its services, programs, activities, education and employment for individuals with disabilities. To request disability accommodation, contact the counselor for students with disabilities at (843) 525-8228 during the first ten business days of the academic term.

ATTENDANCE
1. The College’s statement of policy indicates that students must attend ninety percent of total class hours or they will be in violation of the attendance policy.
2. Students not physically attending class during the first ten calendar days from the start of the semester must be dropped from the class for NOT ATTENDING.
3. Students taking an online/internet class must sign in and communicate with the instructor within the first ten calendar days from the start of the semester to indicate attendance in the class. Students not attending class during the first ten calendar days from the start of the semester must be dropped from the class for NOT ATTENDING.
4. Reinstatement requires the signature of the division dean.
   a. In the event it becomes necessary for a student to withdraw from the course OR if a student stops attending class, it is the student's responsibility to initiate and complete the necessary paperwork. Withdrawing from class may have consequences associated with financial aid and time to completion.
   b. When a student exceeds the allowed absences, the student is in violation of the attendance policy. The instructor MUST withdrawal the student with a grade of “W”, “WP”, or “WF” depending on the date the student exceeded the allowed absences and the student’s progress up to the last date of attendance.
c. under extenuating circumstances and at the discretion of the faculty member teaching the
class, allow the student to continue in the class and make-up the work. This exception must
be documented at the time the allowed absences are exceeded.
d. Absences are counted from the first day of class. There are no "excused" absences. All
absences are counted, regardless of the reason for the absence.
5. A student must take the final exam or be excused from the final exam in order to earn a non-
withdrawal grade.
6. Students are expected to be in class on time. Arrival to class after the scheduled start time or
leaving class prior to dismissal counts as a tardy. Three tardies and/or early departures are
considered as one absence unless stated otherwise.
7. It is the student’s responsibility to sign the roll/verify attendance with instructor upon entering
the classroom. Failure to sign the roll/verify attendance results in a recorded absence. In the
event of tardiness, it is the student’s responsibility to insure that attendance is marked. The
student is responsible for all material/ announcements presented, whether present or absent.
8. Continuity of classroom and laboratory (which includes clinical experiences) is essential to the
student’s progress in providing safe and competent patient care. Students are expected to use
appropriate judgment for participating in clinical activities. To evaluate the student’s knowledge
and skills, it is necessary for the student to be present for all clinical experiences. If absence
does occur, the designated clinical site, in addition to the Division of Health Sciences
Administrative Assistant, must be notified by telephone no later than 30 minutes prior to the
start of the clinical experience. The Division of Health Sciences telephone number is 843-525-
8267.

A copy of TCL’s STATEMENT OF POLICY NUMBER: 3-1-307 CLASS ATTENDANCE (WITHDRAWAL) is on
file in the Division Office and in the Learning Resources Center.

HAZARDOUS WEATHER
In case weather conditions are so severe that operation of the College may clearly pose a hardship on
students and staff traveling to the College, notification of closing will be made through the following
radio and television stations: WYKZ 98.7, WGCO 98.3, WGZO 103.1, WFXH 106.1, WWVV 106.9, WLOW
107.9, WGZR 104.9, WFXH 1130 AM, WLVH 101.1, WSOK 1230 AM, WAEV 97.3, WTOC TV, WTGS TV,
WJWJ TV, and WSAV TV. Students, faculty and staff are highly encouraged to opt in to the Emergency
Text Message Alert System. www.tcl.edu/textalert.asp

ACADEMIC MISCONDUCT
There is no tolerance at TCL for academic dishonesty and misconduct. The College expects all students
to conduct themselves with dignity and to maintain high standards of responsible citizenship.

It is the student’s responsibility to address any questions regarding what might constitute academic
misconduct to the course instructor for further clarification.

The College adheres to the Student Code for the South Carolina Technical College System. Copies of the
Student Code and Grievance Procedure are provided in the TCL Student Handbook, the Division Office,
and the Learning Resources Center.
Health care professionals hold the public trust. Academic misconduct by health science students calls
that trust into question and academic integrity is expected.

Reviewed and approved M. Sapp 05-05-2014
It is a fundamental requirement that any work presented by students will be their own. Examples of academic misconduct include (but are not limited to):

1. copying the work of another student or allowing another student to copy working papers, printed output, electronic files, quizzes, tests, or assignments.
2. completing the work of another student or allowing another student to complete or contribute to working papers, printed output, electronic files, quizzes, tests, or assignments.
3. viewing another student’s computer screen during a quiz or examination.
4. talking or communicating with another student during a test.
5. violating procedures prescribed by the instructor to protect the integrity of a quiz, test, or assignment.
6. plagiarism in any form, including, but not limited to: copying/pasting from a website, textbook, previously submitted student work, or any instructor-prepared class material; obvious violation of any copyright-protected materials.
7. knowingly aiding a person involved in academic misconduct.
8. providing false information to staff and/or faculty.
9. entering an office unaccompanied by faculty or staff.
10. misuse of electronic devices.

**Instructors**

**Lecture:** Jennifer Culbreth, BS, PTA  
Office Location: Bldg 4/125  
Telephone: 843-470-5956  
jculbreth@tcl.edu

**Lab:** Kevin Green, PTA  
Partner, Carolina SportsCare  
kgreen@carolinasportscare.com
### PTH 240 Therapeutic Exercise/Application

**Laboratory Skills Achievement List**

#### Goniometry

<table>
<thead>
<tr>
<th>Joint</th>
<th>Movements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shoulder</td>
<td>Abduction, Flexion/extension, Int/Ext rotation</td>
</tr>
<tr>
<td>Elbow</td>
<td>Flexion/extension</td>
</tr>
<tr>
<td>Forearm</td>
<td>Pronation/supination</td>
</tr>
<tr>
<td>Wrist</td>
<td>Flexion/extension, Radial/Ulnar deviation</td>
</tr>
<tr>
<td>Hip</td>
<td>Flexion/extension</td>
</tr>
<tr>
<td>Abduction</td>
<td>Abduction/adduction</td>
</tr>
<tr>
<td>Int/Ext rotation</td>
<td>Int/Ext rotation</td>
</tr>
<tr>
<td>Knee</td>
<td>Flexion/extension</td>
</tr>
<tr>
<td>Ankle</td>
<td>Dorsiflexion/plantar flexion</td>
</tr>
<tr>
<td>Foot</td>
<td>Inversion/Eversion</td>
</tr>
</tbody>
</table>

#### Stump Wrapping

- Below knee wrap
- Above knee wrap