Therapeutic Exercise
KIN 4346

Instructor: Sherry Ann Miller, MS, ATC, LAT

Term: Spring 2019

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Office: Center for Human Performance Room 104; 486-6171

Office Hours: Monday & Wednesday: 12:00 pm to 2:00 pm; Tuesday: 11:00 am to 12:00 pm; Thursday: 11:00 am to 2:00 pm

Class Schedule: Tuesday and Thursday: 9:30 am to 10:45 am in CHP 143


Course Description: The student will implement a comprehensive rehabilitation/reconditioning program for injuries sustained by an active population. The programs involve techniques of flexibility, muscular strength, muscular power, muscular endurance, and cardiovascular training.

Course Objectives:

1) Predict the physiological process of wound healing, tissue repair, and its implications on the development and progression of an appropriate rehabilitation/reconditioning program.

2) Describe and interpret appropriate measurement and function testing procedures as they relate to therapeutic exercise.

3) Recommend the appropriate therapeutic exercise plan and determine appropriate therapeutic goals and objectives based on the initial assessment, frequent reassessments, and appropriate goal setting.

4) Describe the basic components of activity-specific functional progressions in a therapeutic exercise program.

5) Use objective measurement results (muscular strength/endurance, range of motion, etc.) as a basis for developing individualized rehabilitation or reconditioning programs.

6) Measures the physical effects of injury using contemporary methods (isokinetic devices, goniometers, dynamometers, manual muscle testing, calipers, functional testing) and use this data as a basis for developing individualized rehabilitation or reconditioning programs.

7) Describes the indications, contraindications, theory and principles for the incorporation and application of various contemporary therapeutic exercise and demonstrate the appropriate application of contemporary therapeutic exercises including the following:
   a) Isometric, isotonic and isokinetic
   b) Eccentric and concentric exercise
   c) Open and closed chain exercise
   d) Elastic, mechanical and manual resistance exercise
   e) Joint mobilization exercise
   f) Plyometric-dynamic reactive exercise
   g) Proprioceptive neuromuscular facilitation (PNF) for muscular strength/endurance, muscle stretching, and improving range of motion
   h) Exercises to improve neuromuscular coordination and proprioception
   i) Passive, active, and active-assistive exercise
   j) Cardiovascular exercise, including the use of stationary bicycles, upper-body ergometer, treadmill, and stair climber
   k) Aquatic therapy
   l) Functional rehabilitation and reconditioning
   m) Sport specific activity
   n) Soft tissue mobilization
   o) Demonstrate the proper techniques for performance of commonly prescribed rehabilitation and reconditioning exercises
   p) Accept the professional, ethical, and legal parameters that define the proper role of the athletic trainer in the treatment, rehabilitation, or reconditioning of athletes and others involved in physical activity.
**Attendance Policy:** Students are expected to be present for all class meeting of the courses for which they are registered. An accurate record of attendance for each student will be maintained by the instructor. The student will be allowed two unexcused absences. If you know that you will be absent or an emergency arises, contact myself, my voice mail and/or the Student Life Office. Please understand not all absences reported are considered excused. Three tardies are counted as one (1) unexcused absence. After the second unexcused absence, ten points will be deducted from your final point total for each unexcused absence. Please understand that being late to class 15 minutes and beyond will be counted as an unexcused absence.

**Person Seeking Accommodations:** Persons with disabilities which may warrant academic accommodations must contact the Student Life Office, Room 112 University Center, in order to request such accommodations prior to any accommodations being implemented. You are encouraged to make this request early in the semester so that appropriate arrangements can be made.

**Academic Honesty:** The University expects all students to engage in all academic pursuits in a manner that is beyond reproach. Students will be expected to maintain complete honesty and integrity in their experiences in the classroom. Any student found guilty of any form of dishonesty in academic work is subject to disciplinary action. Procedures of discipline due to academic dishonesty have been adopted by the Board of Regents and are published under the section on "Student Services and Activities" in the University’s Student Handbook.

**Instructor Expectations:** The instructor and/or clinical preceptor have several expectations of you, the student, while in this course.

1. Professional behavior and language are required. Profanity is not an acceptable form of professional language.
2. Punctuality is a must.
3. Please remove hats while in class. This is for males and females alike.
4. It is your responsibility to read and comply with the syllabus. There will be no e-mail reminders or announcements to do class assignments, homework, and/or online assignments or examinations.
5. Please be dressed appropriately for class especially on days we do activities.
6. It is your responsibility to report missing grades and/or incorrect grades on Blackboard immediately. Waiting until the end of the semester is not a plausible excuse.
7. Electronic devices need to be on silence mode and put away unless you are using these devices to take notes. It is acceptable and encouraged to have them out in this situation. Please understand that if you have an emergency and are expecting a call, please let the instructor know. Step outside of the classroom and attend to your affairs. Otherwise if your phone rings during class time and/or you are “on” your phone during class time, you will be counted absent.
8. All assignments are due at the beginning of class and/or e-mailed to the instructor before or by 11 am on the due date. If late submissions are accepted, points will be deducted as follows: 1 class day: 5 points; 2 class days: 10 points; 3 class days: 15 points, and etc. Please understand the late submissions are accepted at the discretion of the instructor. Late submissions apply only to in class assignments

**Course Evaluation:**
1. Each student must successfully pass 3 written examinations. Total points is 300.
2. Each lecture exam will be in the format of: multiple choice, true/false, matching, fill in the blank, short answer, and essay.
3. Rehabilitation protocols for specific injuries will be assigned. Each protocol is worth 100 points. Seven protocols total. {700 points}
4. Presentations over the rehabilitation protocols assigned. 25 points each with five presentations total. {125 points}
5. Rehabilitation portfolio: The portfolio is worth a total of 300 points.
6. Participation in and teaching presentation of exercise protocol activities – labs: 6 labs at 15 points each. {90 points}
7. Final exam – 100 points. Guidelines attached at the end of daily schedule.

Grading is based off total points falling in a range: Total points possible are 1615.

A = 1453.5-1615
B = 1292-1453.499
C = 1130.5-1291.999
D = 969-1130.499
**Athletic Training Specialization Students:** All students in the Athletic Training Specialization Program must comply with clinical hours and clinical skill assessments even if you decide to withdrawal from the program. If students do not comply with clinical skill assessments, you will be suspended from clinical hours in which will jeopardize your grade and date of graduation.

8. Clinical Hours – 100 points
9. Clinical Skill Assessments: 10 @ 25 points each. 250 points total. It is required that you pass 80% of the skill assessment in order to progress to the next assessment.

<table>
<thead>
<tr>
<th>Clinical Hours:</th>
<th>Clinical Skill Assessment:</th>
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<tbody>
<tr>
<td>240-300 hours</td>
<td>100 points</td>
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<tr>
<td>165-239 hours</td>
<td>70 points</td>
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<tr>
<td>105-164 hours</td>
<td>40 points</td>
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<tr>
<td>45-104 hours</td>
<td>10 points</td>
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<tr>
<td>0-44 hours</td>
<td>0 points</td>
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**Clinical Skill Assessment:**
- 90-100% of assessment correct: 25 points
- 80-89.99% of assessment correct: 20 points
- 70-79.99% of assessment correct: 15 points
- 60-69.99% of assessment correct: 10 points
- 59.99% and below: 0 points

**Grading range for athletic training specialization students – maximum total points possible 1965**
- A = 1768.5-1965
- B = 1572-1768.499
- C = 1375.5-1571.999
- D = 1179-1375.499

**Tentative Daily Schedule:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>January 15</td>
<td>Introduction and course expectations</td>
</tr>
<tr>
<td>January 17</td>
<td>Ch. 1 Concepts of Rehabilitation</td>
</tr>
<tr>
<td>January 22</td>
<td>Ch. 2 Concepts of Healing</td>
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<td>January 24</td>
<td>Ch. 3 Concepts in Physics in Therapeutic Exercise</td>
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<td>January 29</td>
<td>Ch. 4 Examination and Assessment for Rehabilitation</td>
</tr>
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<td>January 31</td>
<td>Ch. 5 Range of Motion and Flexibility</td>
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<tr>
<td>February 5</td>
<td>Ch. 5 Range of Motion and Flexibility (In practice – Lab 1)</td>
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<tr>
<td>February 7</td>
<td><strong>Written Examination One</strong></td>
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<tr>
<td>February 12</td>
<td>Ch. 13 Manual Therapy</td>
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<td>February 14</td>
<td>Ch. 13 Manual Therapy (In practice – Lab 2)</td>
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<tr>
<td>February 19</td>
<td>Ch. 13 Manual Therapy (In practice – Lab 2)</td>
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<tr>
<td>February 21</td>
<td>Ch. 7 Muscle Strength and Endurance/Rehabilitation protocol due for shoulder</td>
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<tr>
<td>February 26</td>
<td>Ch. 7 Muscle Strength and Endurance (In practice – Lab 3)</td>
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<tr>
<td>February 28</td>
<td>Ch. 6 The ABCs of Proprioception /Rehabilitation protocol due for elbow</td>
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<td>March 5</td>
<td>Ch. 8 Plyometrics</td>
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<td>March 7</td>
<td>Ch. 9 Functional and Performance Specific Development /Rehabilitation protocol due for wrist/hand</td>
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<tr>
<td>March 11-15</td>
<td><strong>Spring Break (University Holiday)</strong></td>
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<tr>
<td>March 19</td>
<td><strong>Written Examination Two</strong></td>
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<tr>
<td>March 21</td>
<td>Ch. 8 Plyometrics (In practice – 4)/ / Rehabilitation protocol due for foot/ankle</td>
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<tr>
<td>March 26</td>
<td>Ch. 9 Functional and Performance Specific Development (In practice – Lab 4)</td>
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<td>March 28</td>
<td>Ch. 12 Aquatic Therapeutic Exercise</td>
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<td>April 2</td>
<td>Ch. 12 Aquatic Therapeutic Exercise (In practice – Lab 5) /Rehabilitation protocol due for knee</td>
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<td>April 4</td>
<td>Ch. 14 Therapeutic Exercise Equipment</td>
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<td>April 9</td>
<td>Ch. 14 Therapeutic Exercise Equipment (In practice – Lab 6) /Rehabilitation protocol due for hip/pelvis</td>
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<tr>
<td>April 11</td>
<td>Ch. 17 Sacroiliium and Pelvic Stabilization / Rehabilitation protocol due for spine</td>
</tr>
</tbody>
</table>
April 16: **Written examination Three**
April 18: **Presentations of Rehabilitation protocols (shoulder)**
April 23: **Presentations of Rehabilitation protocols (elbow)**
April 25: **Presentations of Rehabilitation protocols (foot/ankle)**
April 30: **Presentations of Rehabilitation protocols (knee)**
May 2: **Presentations of Rehabilitation protocols (Spine)**
May 3: **Rehabilitation Portfolio Due (Turn in CHP 104) {before 2 pm}**
May 9: **Final Exam 8 am to 10 am (In CHP 143)**

Design and Production of a Therapeutic Exercise Device

For your final examination, you will design, produce, and provide a detail description of the therapeutic exercise device and/or tool. It is your choice as to which category of therapeutic devices and/or tools you develop. (ie: ROM, Aqua, Plyometrics, Manual Therapy)

**Guidelines:**
1. Design of device/tool
2. Produce the device/tool
3. Cost of construction is limited to no more than 25 dollars.
4. Written, detailed description of how to use, in what manner, and if a commercially made product, how your product is comparable. Include instructions on how device was created and the budget that was used. The paper should be typed, use 11 point font, and single spaced format with a cover page and reference page due May 2, 2019.
5. Please be creative. Original concepts are stressed.
6. Presentation during exam time, which needs to include a description of the device, budget and construction of device, demonstration of how the device is to be used, and how this device will benefit sports medicine. Power points, google slides and/or Prezi software may be used to present material.
7. A paper copy of presentation turned into instructor on May 9, 2019

50 points for design, production, and written description of device
50 points for presentation
100 points total
Rehabilitation Portfolio: Comprehensive Rehabilitation portfolio which consists of the following:

A. A three ring, 3 inch notebook with dividers
B. Completed rehabilitation protocols over the injuries you were assigned
C. Diagnostic Testing
D. Pictures and/or diagrams of exercises
E. Indications and contraindications for rehabilitation exercises
F. Instructions for when to use and/or not use a "heating and/or "cooling" modalities
G. Case studies over rehabilitation protocols for the following anatomical sites:
   1. Shoulder
   2. Elbow
   3. Wrist/hand
   4. Foot/ankle
   5. Knee
   6. Hip/pelvis
   7. Spine

A. A three ring, 3 inch notebook with dividers for each topic. You will receive these back.

B. Rehabilitation protocols:

The rehabilitation protocol for each injury that you are assigned should include the following information. Each one should be in a SOAP note format. More emphasizes should be on the “plan” portion of the SOAP note. The “subjective” should provide enough history in order to understand why you developed this protocol. “Objective” should include the basic information on what was positive and/or negative; ranges of motion; neurological, and whatever else should be provided so others reading it have enough information to know why you chose the exercises you did. “Assessment” is what the injury assigned to you is. The “Plan” Portion is a very detailed section including the following: Physicians orders; short term and long term goals for each week or month or phase; rehabilitation protocol for 12 weeks; pictures and/or diagrams of exercises; sets and repetitions, and resistance amounts. Instructions about when to progress and when the patient will be considered “released” should be developed and included in the protocol. Please document your sources including pictures/diagrams of exercises. You will be assigned the injuries for the following anatomical sites: shoulder; elbow; wrist/hand; foot/ankle; knee; hip/pelvis, and spine.

C. Diagnostic Testing:

You are going to research the following diagnostic imaging techniques. Once you know the pertinent information about each, you are going to create a one page “information and/or fact sheet”. This sheet would be what you would give to your patients/clients/athletes before they have any of the following tests. Be creative.

*Diagnostic Tests:*
- Magnetic Resonance Imaging (MRI)
- Computed Tomography (CT)
- Radiograph
- Electrocardiogram (ECG)
- Bone scan
- Echocardiogram

D. Pictures and/or diagrams of exercises for the following categories:

1. Range of motion/flexibility
2. Muscular strength
3. Muscular endurance
4. Balance
5. Cardiorespiratory endurance
6. Core stabilization
7. Plyometrics
8. Open kinetic chain
9. Closed kinetic chain
10. Isometrics
11. PNF
12. Aquatic
13. Functional progressions
14. “Thrower’s Ten”
15. Williams’ Flexion Exercises
16. McKenzie back program
This project is to help you develop a working knowledge of the different types of exercises to accomplish rehabilitation protocols for the different injuries that could be present in the active population. The exercises can be found in different sources such as journals, books, and the internet. There needs to be instructions and some sort of picture, diagram, and/or drawing of what the exercise is. There must be documentation as to where you received the information. Make sure that the sheets are in good order that you may make copies to give to patients/athletes when you set up a rehabilitation protocol for them. You will need 6 exercises in each category except for the last three categories. For the last three categories, you will need to include the entire exercise protocol only once.

E. Indications and contraindications for rehabilitation exercises
   A one to two page chart; flyer; and/or “fact” sheet about the generalized indications and contraindications for most exercises that you select for your rehabilitation protocols. This needs to look professional enough to give to patients/athletes so that they are aware of the indications and contraindications of exercises. Include instructions on what to do if patient/athlete becomes aware of either condition. Please document your information.

F. Instructions for when to use and/or not use a “heating” and “cooling” modalities.
   A one to two page “fact” sheet with instructions when to use and not use a heating modality and/or cold modality. Please make sure to document your work. Here again provide detail instructions about what to do if your patient is experiencing any of the indications and/or contraindications.

G. Case studies over rehabilitation protocols of the following anatomical sites:
   1. Shoulder
   2. Elbow
   3. Wrist/hand
   4. Foot/ankle
   5. Knee
   6. Hip/pelvis
   7. Spine

You are to find a rehabilitation protocol for each site, but not one you are creating for the injury you were assigned. Please make a copy of the protocol, and then write a one page summary about what you learned from this protocol; what you plan including in your own protocol; and why you chose to include these exercises in your own protocol. Please document your sources.
Protocol presentations:
You will present each of your injury protocols to your peers in class. The presentations are 10-12 minutes in length. You are teaching your classmates about what you chose to rehabilitate your patient/athlete. Include demonstrations of exercises that your classmates are not familiar with; including rationale as to why you chose these exercises. You will need to be professionally dressed, copies of you protocol for classmates and instructor, and a copy of your presentation for the instructor.
Example of protocol:
The following is an example of how you may choose to write your protocol. It is only an example. There are multiple
formats that can be used to develop a protocol. Find one that you feel comfortable with and use that style.

A 30 year old female recreational indoor soccer player attempted to cut on her right ankle when she experienced pain and
felt a pop over her lateral ankle. Upon assessment, there is mild swelling over the anterior talofibular ligament; some
point tenderness over the same area; negative anterior drawer; negative talar tilt; and active range of motion is within
normal limits except with pain with inversion. Athlete was referred to a physician since this is her first injury to her ankle.
X-rays were negative, and the physician diagnosed her with a 1 degree lateral ankle sprain.

Long term goals: The long term goals for this patient is to return them to activities of daily living and to recreational soccer
with normal movement patterns for both.

Short term goals: The initial short term goals are to decrease inflammation and decrease pain. The other short term goals
for this patient is to increase strength, active range of motion, neuromuscular control, cardiorespiratory endurance, and
functional patterns of activities of daily living and soccer.

Week one:

Days 1-3: Modalities of pertaining to active rest, ice, compression and elevation. Patient will ice, use compression and
elevate her ankle for 15 minutes. After modalities, patient will perform active range of motion being that of plantarflexion,
dorsiflexion, and eversion with no weight at 2 sets of 15 reps. Patient will begin towel crunches and towel slides with no
weight 2 sets of 15 reps. Patient will be given a brace to use while performing activities of daily living and can use brace
for rehabilitation exercises. The patient will receive instructions on how to use and the proper care of the brace. The
patient will apply brace, and stationary cycling will be performed for 15 minutes. The patient is instructed to pedal at a
pace that is pain free for them. Patient is iced after exercises, and given a home program of exercises to do. The home
program consists of elevation and ankle pumps for 15 minutes at least three times a day. Instruct patient in normal gait
pattern before leaving the athletic training facility.

Days 4-7: Modalities of ice, compression, and elevation before and ice and elevation after session.
AROM: plantarflexion, dorsiflexion, eversion with no weight 3 sets of 15 reps. Initiate inversion with no weight as long as
pain free, 2 sets of 15 reps.
Towel crunches with 1 pound weight, 3 x 15
Towel slides with no weight, 3 x 15
Marble pick up – 4 times total; 2 to each side of cup

Cardiorespiratory:
Days 4 and 6 – Patient in brace to cycle for 25 minutes above 50 rpms. 15 minutes on the UBE to work the upper body.
Days 5 and 7 – Aquatic program: swimming laps with arms only 5 laps (Down and back is one lap; the length of the pool)
Walking for 10 minutes the width of the pool
Aquajogger – 20 minutes jogging in the deep end.

Week two:

Days 8 – 14:
If inflammation is minimal, start patient with the warm whirlpool for 10 minutes before exercise session; ice and elevation
after exercises session.

Days 8-10
AROM: plantarflexion, dorsiflexion, and eversion with red thera-band 3 x 15; inversion, red thera-band – 2 x 15
Towel crunches with 2 pound weight, 3 x 15
Towel slides with 1 pound weight, 3 x 15
Marble pick up – 4 times total; 2 to each side of cup
Heel raises – 3 x 20
Toe raises – 3 x 20
Dynadisk – bilateral; balance for 30 second intervals for 3 times.

**Days 11 – 13**
If patient is pain free and minimal inflammation progress to:
AROM: all planes of motion with red thera-band, 3 x 10
Towel crunches with 3 pound weight, 3 x 15
Towel slides with 2 pound weight, 3 x 15
Marble pick up – 4 times total; 2 to each side of cup
Heel raises – 3 x 20
Toe raises – 3 x 20
Dynadisk – bilateral, balance for 30 second intervals for 3 times.
BAPS board while seated – clock wise 3 times for one minute each; and counter clock wise 3 times for one minute each

Cardiorespiratory:
**Days 8, 10, and 12** – Patient in brace to cycle for 15 minutes above 50 rpms; 15 minutes on the UBE; and 10 minutes of walking on the treadmill at a 1% grade.
**Days 9, 11, and 13** – Aquatic program: swimming laps with arms only 5 laps; swimming laps with the kickboard 5 laps. Jogging in waist high water for 10 minutes the width of the pool
Aquajogger – 20 minutes jogging in the deep end; cross country skiing for 10 minutes
**Day 14** – Activities of daily living, ice and elevation for 15 minutes
Patient is to continue home program of ice and elevation at least twice a day. Patient may start doing more activities of daily living while braced.