Chair: Tracy Christofero | **GC#7: Course Change**

Request for Graduate Course Change

1. Prepare one paper copy with all signatures and supporting material and forward to the Graduate Council Chair.
2. E-mail one identical PDF copy to the Graduate Council Chair. If attachments included, please merge into a single file.
3. ***The Graduate Council cannot process this application until it has received both the PDF copy and the signed hard copy.***

College: COHP Dept/Division: School of PT Current Alpha Designator/Number: PT 721

Contact Person: Neil Evans Phone: 6-5617

CURRENT COURSE DATA:

Course Title: Applied Exercise Physiology and Therapeutic Exercise

Alpha Designator/Number: P T 7 2 1

Title Abbreviation: A p p l E x P h y s & T h e r E x

1. Complete this **five** page form in its entirety and route through the departments/committees below for changes to a course involving: course title, alpha designator, course number, course content, credit hours, or catalog description.
2. If this change will affect other departments that require this course, please send a memo to the affected department and include it with this packet, as well as the response received from the affected department.
3. If the changes made to this course will make the course similar in title or content to another department's courses, please send a memo to the affected department and include it with this packet as well as the response received from the affected department.
4. List courses, if any, that will be deleted because of this change (*must submit course deletion form).*
5. If the faculty requirements and/or equipment need to be changed upon approval of this proposal, attach a written estimate of additional needs.

Signatures: if disapproved at any level, do not sign. Return to previous signer with recommendation attached.

Dept. Chair/Division Head	Date 3/23/15
Registrar	Date 3/23/15
College Curriculum Chair	Date 4/3/15
Graduate Council Chair	Date

Chair: Tracy Christofero | **GC#7: Course Change**

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College: COHP Dept/Division: School of PT Current Alpha Designator/Number: PT 721

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3. If the changes made to this course will make the course similar in title or content to another department's courses, please send a memo to the affected department and include it with this packet as well as the response received from the affected department.
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Dept. Chair/Division Head	Date 3/23/15
Registrar	Date 3/23/15
College Curriculum Chair	Date
Graduate Council Chair	Date

Request for Graduate Course Change - Page 2

College: COHP | Department/Division: School of PT | Alpha Designator/Number: PT 721

Provide complete information regarding the course change for each topic listed below.

Change in CATALOG TITLE: ☒ YES ☐ NO

From: Appl Ex Phys & Ther Ex (limited to 30 characters and spaces)

To: Appl Ex Phys

If Yes, Rationale: The therapeutic exercise component is being removed from this course and being added into PT 732 Therapeutic Interventions. Therefore, the name should change.

Change in COURSE ALPHA DESIGNATOR:

From: To: ☐ YES ☒ NO

If Yes, Rationale:

Change in COURSE NUMBER: ☐ YES ☒ NO

From: To:

If Yes, Rationale:

Change in COURSE GRADING

From ☐ Grade To ☐ Credit/No Credit

Rationale: No Change

Change in CATALOG DESCRIPTION: ☒ YES ☐ NO IF YES, fill in below:

From: Physiological effects of exercise and training in healthy individuals and individuals with pathological dysfunction. Includes exercises for joint and muscle mobility, muscle strength, cardiopulmonary, and neuromuscular function.

To: Physiological effects of exercise and training in healthy individuals and individuals with pathological dysfunction.

If Yes Rationale: The therapeutic exercise component of the course is being removed. Therefore, the course description needs changed to represent the content of the course.

Request for Graduate Course Change - Page 3

Change in COURSE CREDIT HOURS: ☒ YES ☐ NO If YES, fill in below:

NOTE: If credit hours increase/decrease, please provide documentation that specifies the adjusted work requirements.

From: 4

To: 3, Since content is moving out of this course the credit hours are being adjusted

Change in COURSE CONTENT: ☒ YES ☐ NO

From: The course currently has content related to exercise physiology and therapeutic exercise.

To: Exercise physiology only.

Rationale: Since the therapeutic exercise will be removed and placed into PT 732 therapeutic interventions, the content is shortened and includes only the exercise physiology material.

Request for Graduate Course Change-Page 4

College: COPH

Department: School of PT

Course Number/Title PT 721/ Applied Exercise Physiology

1. REQUIRED COURSE: If this course is required by another department(s), identify it/them by name and attach the written notification you sent to them announcing to them the proposed change and any response received. Enter NOT APPLICABLE if not applicable.

NOT Applicable

2. COURSE DELETION: List any courses that will be deleted because of this change. A *Course Deletion* form is also required. Enter NOT APPLICABLE if not applicable.

NOT Applicable

3. ADDITIONAL RESOURCE REQUIREMENTS: If your department requires additional faculty, equipment, or specialized materials as a result of this change, attach an estimate of the time and cost etc. required to secure these items. (NOTE: approval of this form does not imply approval for additional resources. Enter NOT APPLICABLE if not applicable.

NOT Applicable

Request for Graduate Course Change - Page 5

Please insert in the text box below your course change summary information for the Graduate Council agenda. Please enter the information exactly in this way (including headings) based on the appropriate change:

COURSE DESCRIPTION CHANGE	COURSE NUMBER CHANGE	COURSE TITLE CHANGE
Department:	Department:	Department:
Course Number and Title:	Current Course Number/Title:	Current Course Number/Title:
Rationale:	New Course Number:	New Course Title:
Course Description (old)	Rationale:	Rationale:
Course Description: (new)	Catalog Description:	Catalog Description:
Catalog Description:	Credit hours:	

COURSE DESCRIPTION CHANGE
Department:
School of Physical Therapy
Course Number and Title:
PT 721 Applied Exercise Physiology
Rationale:
The therapeutic exercise is being removed from this course and being added into PT 732 Therapeutic Interventions. Therefore the course description should change to reflect the content being taught within the course.
Course Description (old):
Physiological effects of exercise and training in healthy individuals and individuals with pathological dysfunction. Includes exercises for joint and muscle mobility, muscle strength, cardiopulmonary, and neuromuscular function.
Course Description: (new)
Physiological effects of exercise and training in healthy individuals and individuals with pathological dysfunction.
Credit hours:
3
Catalog Description:
Physiological effects of exercise and training in healthy individuals and individuals with pathological dysfunction.

COURSE TITLE CHANGE
Department:
School of Physical Therapy
Current Course Number/Title:
PT 721 Applied Exercise Physiology & Therapeutic Exercise
New Course Title:
PT 721 Applied Exercise Physiology
Rationale:

New

Marshall University
School of Physical Therapy

Course Title/Number	PT 721: Applied Exercise Physiology and Therapeutic Exercise in Rehab
Semester/Year	Fall 2016
Days/Time	Monday 9-11AM Wednesday 9-11AM
Location	SOPT 111
Instructors	Terry Shepherd, PhD Neil Evans, PT, DPT, OCS, CSCS
Office	Henderson 2012 (Shepherd) SOPT 133 (Evans)
Phone	304-696-3186 (Shepherd) 304-696-5617 (Evans)
E-Mail	shephert@marshall.edu (Shepherd) evansn@marshall.edu (Evans)
Office/Hours	By Appointment (Shepherd) By Appointment (Evans)
University Policies	By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy be going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to http://www.marshall.edu/academic-affairs/?page_id=802 Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment

Course Description: From Catalog

Physiological effects of exercise and training in healthy individuals and individuals with pathological dysfunction. Includes exercises for joint and muscle mobility, muscle strength, cardiopulmonary, and neuromuscular function.

By the end of this course the students will be able to meet all of the following student learning outcomes.

Course Student Learning Outcomes	CAPTE Criteria	How students will practice each outcome in this Course	How student achievement of each outcome will be assessed in this Course
1) Discuss specific characteristics of exercise and metabolism including:	CC-1	Reading assignments	Written Exam

a) The relationship between exercise intensity/duration and the bioenergetics pathways responsible for the production of ATP during various types of exercise. b) The factors that impact the selection and regulation of fuel during various types of exercise. c) The metabolic events that occur during the recovery from various exercise intensities. d) The relationship between exercise and blood lactate concentrations.		Lecture Laboratory Examples/ practice	Laboratory Report/ Case examples
2) Discuss the relationship between exercise and endocrine function, including the role of hormones in the maintenance of blood glucose concentration and the mobilization of muscle glycogen and free fatty acids during graded and prolonged exercise.	CC-1	Reading Assignments Lecture	Written Exam
3) Discuss cardiovascular and pulmonary responses to exercise including: **a)** The physiologic adaptations of the cardiovascular and pulmonary systems that occur with prolonged bed rest, submaximal and maximal exercise. **b)** The differences in cardiovascular and pulmonary responses to exercise in conditioned vs. unconditioned people. **c)** The differences in cardiovascular and pulmonary responses to static exercise vs. dynamic exercise and upper extremity vs. lower extremity exercise.	CC-1	Reading Assignments Lecture Research Articles Laboratory Examples/Practice	Written Exam Laboratory Report
(4). Demonstrate the ability to competently carry out exercise testing, and assessment and develop	CC-5.30	Reading Assignments Lecture Laboratory	Written Exam Laboratory Cases Laboratory Report

and carry out an exercise plan for patients referred to physical therapy including: **a)** The ability to select and administer exercise test protocols which are safe and appropriate relative to the age and health status of the patient. **b)** The ability to identify patients for whom physician supervision is recommended during maximal and submaximal graded exercise testing. **c)** The ability to recognize signs/symptoms of patients in which exercise should be deferred, delayed or terminated. **d)** The ability to administer a submaximal graded exercise test; and measuring heart rate and blood pressure. **e)** The ability to interpret test results. **f)** The ability to provide specific written modification for an age appropriate exercise prescription (e.g., child, adolescent, geriatric).		Examples/Practice	Lab Check-offs
6)Identify in writing and demonstrate in laboratory, the aspects of a comprehensive, individualized health-fitness assessment and community wellness screening and exercise treatment plan including: **a)** Identity use of a health history to determine cardiovascular disease risk factors. **b)** Identity evaluation of aerobic capacity, and body composition. **c)** Identify and develop a comprehensive exercise plan using exercise physiology principles.	CC- 5.30; 5.51	Reading assignments Lecture Laboratory Examples/Practice	Written Exam Laboratory Report
7) **Describe the measurement principles and accuracy of common**	CC-5.30	Reading assignments Lecture	Written Exam Laboratory Report

methods to measure body composition and describe recommended ranges for percent body fat based on age and gender and demonstrate the ability to assess body composition using a variety of methods to measure body composition.		Laboratory Examples/Practice	

Texts and Materials

Required:

McArdle, WD, Katch, FI, Katch, VL. Exercise Physiology: Nutrition, Energy, and Human Performance, 7th ed. Lippincott Williams & Wilkins, Baltimore, MD. 2010.

Sphygmomanometer, Stethoscope, and pulse oximetry for labs

Computer with Microsoft Excel

Recommended:
ACSM'S Guidelines for Exercise Testing and Prescription, American College of Sports Medicine. Lippincott Williams & Wilkins, 9th edition, 2013.

Course Requirements / Due Dates

In order to successfully pass PT 721 students will need to have a combined average over 69.50% on all graded exams and assignments. Students should expect to spend an average of 8-12 hours of time outside of class time to be successful.
Lab Reports are due 1 week after the lab has been performed.
Case Sheets will be due at the next scheduled class unless otherwise indicated.

Grading Policy

Unit Exam I	100
Unit Exam II	100
Unit Exam III	100
Lab Reports (4 @ 20 pts. each)	80

GRADE	PERCENTAGE
A	89.50-100
B	79.50- 89.49
C	69.50- 79.49

F	< 69.50	

Unit Exams: The unit exams are multiple choice/true or false formatted examinations that consist of 100 points possible on each exam. The exams will be administered during class time as scheduled on the syllabus. Each item will be statistically analyzed for appropriateness after the examination. Those items that average <50% for the entire class AND <60% of the upper quarter of students on the exam will be removed from the exam by adding a point

Lab Activities/Reports: This course includes lab activities. There will be laboratory activities that require participation in a group format to experience and develop knowledge pertaining to exercise physiology equipment utilization and applied therapeutic exercise. Students will be required to learn how to use equipment, administer and run physiological tests, interpret physiological tests, apply physiologic testing results to exercise prescription and present data in a complete laboratory report. The laboratory reports will be graded for completeness and accuracy. Additionally, students may be called upon to orally present the lab report to entire class at the discretion of the faculty.

Tentative Course Outline/Schedule

Date	**Topics to be Covered**	**Assignments** Reading, Labs, and Case Studies
01/12/15	Exercise Physiology: Dr. Shepherd • Syllabus Review • Energy Transfer: The bioenergetics of exercise.	McArdle: 135 -152
01/14/15	Exercise Physiology: Dr. Shepherd • Energy Transfer Continued • Energy Expenditure for Various Activities	McArdle: 199 -220
01/19/15	NO CLASS: MLK DAY	
01/21/15	Exercise Physiology: Dr. Shepherd ***Lab#1*** • Metabolic Cart/indirect calorimetry/ technology • VO2 max testing	McArdle: 199 -220
01/26/15	Exercise Physiology: Dr. Shepherd • Substrate Utilization during well fed, starvation, and exercise states	McArdle: 199 -220

	• The Endocrinology of fuel metabolism • The Metabolic Profile	
01/28/15	Exercise Physiology: Dr. Shepherd ***Lab* # 2** • Body Composition Assessment/Techniques • Resting Metabolic Rate/Indirect Calorimetry	
02/02/15	**Exam I**	**Exam I**
02/04/15	Exercise Physiology: Dr. Shepherd • Ventilation • Gas Exchange and Partial Pressures	McArdle:253 – 267
02/09/15	Exercise Physiology: Dr. Shepherd • Respiratory Responses to Exercise • Respiratory Control • Acid Base Balance	McArdle:285 - 301
02/11/15	Exercise Physiology: Dr. Shepherd ***Lab# 3*** • Regression analysis and submax testing • PFT, MVV and Pulmonary Function demo	
02/16/15	Exercise Physiology: Dr. Shepherd • Cardiovascular Response to Exercise • Cardiovascular control	
02/18/15	Exercise Physiology: Dr. Shepherd ***Lab# 4*** Cardiopulmonary Exercise Testing (CEPET)	
02/23/15	Exercise Physiology: Dr. Shepherd • Metabolic Equations • Exercise Prescription	

02/25/15	**Exam II**	**Exam II**
03/02/15	SPRING BREAK	
03/04/15	SPRING BREAK	

Old

Marshall University
School of Physical Therapy

Course Title/Number	PT 721: Applied Exercise Physiology and Therapeutic Exercise in Rehab
Semester/Year	Spring 2015
Days/Time	Monday 9-12AM Wednesday 9-12AM
Location	SOPT 111
Instructors	Terry Shepherd, PhD Neil Evans, PT, DPT, OCS, CSCS
Office	Henderson 2012 (Shepherd) SOPT 133 (Evans)
Phone	304-696-3186 (Shepherd) 304-696-5617 (Evans)
E-Mail	shephert@marshall.edu (Shepherd) evansn@marshall.edu (Evans)
Office/Hours	By Appointment (Shepherd) By Appointment (Evans)
University Policies	By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy be going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to http://www.marshall.edu/academic-affairs/?page_id=802 Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment

Course Description: From Catalog

Physiological effects of exercise and training in healthy individuals and individuals with pathological dysfunction. Includes exercises for joint and muscle mobility, muscle strength, cardiopulmonary, and neuromuscular function.

By the end of this course the students will be able to meet all of the following student learning outcomes.

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2) Discuss the relationship between exercise and endocrine function, including the role of hormones in the maintenance of blood glucose concentration and the mobilization of muscle glycogen and free fatty acids during graded and prolonged exercise.	CC-1	Reading Assignments Lecture	Written Exam
3) Discuss cardiovascular and pulmonary responses to exercise including: **a)** The physiologic adaptations of the cardiovascular and pulmonary systems that occur with prolonged bed rest, submaximal and maximal exercise. **b)** The differences in cardiovascular and pulmonary responses to exercise in conditioned vs. unconditioned people. **c)** The differences in cardiovascular and pulmonary responses to static exercise vs. dynamic exercise and upper extremity vs. lower extremity exercise.	CC-1	Reading Assignments Lecture Research Articles Laboratory Examples/Practice	Written Exam Laboratory Report
(4). Demonstrate the ability to competently carry out exercise testing, and assessment and develop	CC-5.30	Reading Assignments Lecture Laboratory	Written Exam Laboratory Cases Laboratory Report

and carry out an exercise plan for patients referred to physical therapy including: **a)** The ability to select and administer exercise test protocols which are safe and appropriate relative to the age and health status of the patient. **b)** The ability to identify patients for whom physician supervision is recommended during maximal and submaximal graded exercise testing. **c)** The ability to recognize signs/symptoms of patients in which exercise should be deferred, delayed or terminated. **d)** The ability to administer a submaximal graded exercise test; and measuring heart rate and blood pressure. **e)** The ability to interpret test results. **f)** The ability to determine a diagnosis for which the patient will receive physical therapy and develop an exercise program; or determine the need to refer the patient to another health professional for further evaluation and treatment. **g)** The ability to provide specific written modification for an age appropriate exercise prescription (e.g., child, adolescent, geriatric).		Examples/Practice	Lab Check-offs
5)Discuss the neuromuscular system's response to exercise, including: **a)** The physiological adaptations that occur with prolonged bed rest and resistance exercise. **b)** The theories of muscle fatigue and delayed onset muscle soreness following exercise. **c)** The changes in strength and	CC-1	Reading assignments Lecture Outside research articles	Written Exam

endurance as a result of specific exercise programs. **d)** The changes in muscle fiber composition and myosin heavy chain transformation as a result of specific exercise programs.			
6)Identify in writing and demonstrate in laboratory, the aspects of a comprehensive, individualized health-fitness assessment and community wellness screening and exercise treatment plan including: **a)** Identity use of a health history to determine cardiovascular disease risk factors. **b)** Identity evaluation of aerobic capacity, strength, flexibility, and body composition. **c)** Identify and develop a comprehensive exercise plan using exercise physiology principles.	CC- 5.30; 5.51	Reading assignments Lecture Laboratory Examples/Practice	Written Exam Laboratory Report
7) Describe the measurement principles and accuracy of common methods to measure body composition and describe recommended ranges for percent body fat based on age and gender and demonstrate the ability to assess body composition using a variety of methods to measure body composition.	CC-5.30	Reading assignments Lecture Laboratory Examples/Practice	Written Exam Laboratory Report
8) Discuss and implement the various types of resistance training in a laboratory setting or case scenario as appropriate throughout the lifespan including. • **Isometric** • **Isotonic concentric** • **Isotonic eccentric** • **Isokinetic**		Reading assignments Lecture Laboratory Examples/ practice Case Studies	Written examination Case study Laboratory assignments Laboratory Check-offs
9) Discuss and implement exercises specific to balance training in a laboratory setting and case scenario		Reading assignments Lecture Laboratory Examples/	Written examination Case study Laboratory

as appropriate.		practice Case Studies	assignments
10) Discuss and implement appropriate peripheral joint mobilizations in a laboratory setting and case scenario as appropriate, citing appropriate contraindications and precautions that may be present.		Reading assignments Lecture Laboratory examples/ practice Case Studies	Written examination Case study Laboratory assignments
11) Design and safely perform an appropriate exercise program for a patient using a case history on a fellow student, incorporating flexibility techniques, ROM techniques, strengthening techniques, and neuromuscular re-education techniques when appropriate.		Reading assignments Lecture Laboratory examples/practice Case Studies	Written examination Case study Laboratory assignments Laboratory Check-offs
12) Document appropriate skilled interventions demonstrating safe and effective techniques as indicated in each of the case studies presented.		Case Studies	Case Studies Laboratory Check-offs
13) Recognize indications for Active, Active-Assist, and Passive Range of Motion and demonstrate correct employment of each technique	CC-5.39a	Reading assignments Lecture/class discussion Case studies Demonstration/Lab experiences	Written Examination Case Study Laboratory assignments

Texts and Materials

Required:

Kisner, K, Colby, LA. Therapeutic Exercise: Foundations and Techniques, 6th ed. F.A. Davis, Philadelphia, PA. 2012.

McArdle, WD, Katch, FI, Katch, VL. Exercise Physiology: Nutrition, Energy, and Human Performance, 7th ed. Lippincott Williams & Wilkins, Baltimore, MD. 2010.

Sphygmomanometer, Stethoscope, and pulse oximetry for labs

Computer with Microsoft Excel

Recommended:

ACSM'S Guidelines for Exercise Testing and Prescription, American College of Sports Medicine. Lippincott Williams & Wilkins, 9th edition, 2013.

Course Requirements / Due Dates

In order to successfully pass PT 721 students will need to have a combined average over 69.50% on all graded exams and assignments. Students should expect to spend an average of 8-12 hours of time outside of class time to be successful.
Lab Reports are due 1 week after the lab has been performed.
Case Sheets will be due at the next scheduled class unless otherwise indicated.

Grading Policy

Unit Exam I	100
Unit Exam II	100
Unit Exam III	100
Unit Exam IV	100
Lab Reports (4 @ 20 pts. each)	80
Lab Check-off	50
Ther Ex. Case Sheets (3 @ 10 each)	30

GRADE	PERCENTAGE
A	89.50-100
B	79.50- 89.49
C	69.50- 79.49
F	< 69.50

Unit Exams: The unit exams are multiple choice/true or false formatted examinations that consist of 100 points possible on each exam. The exams will be administered during class time as scheduled on the syllabus. Each item will be statistically analyzed for appropriateness after the examination. Those items that average <50% for the entire class AND <60% of the upper quarter of students on the exam will be removed from the exam by adding a point

Lab Activities/Reports: This course includes lab activities. There will be laboratory activities that require participation in a group format to experience and develop knowledge pertaining to exercise physiology equipment utilization and applied therapeutic exercise. Students will be required to learn how to use equipment, administer and run physiological tests, interpret physiological tests, apply physiologic testing results to exercise prescription and present data in a complete laboratory report. The laboratory reports will be graded for completeness and accuracy. Additionally, students may be called upon to orally present the lab report to entire class at the discretion of the faculty.

Laboratory Check-offs: You will have one laboratory check off over selection and implementation of appropriate therapeutic exercises.

Case Sheets: Students will be given 3 "case sheets" during selected laboratory activities to reinforce the information that has been presented in the lecture and laboratory setting. These sheets will contain questions that will require students to stay on task and be organized in a way to encourage critical thinking skills. The pertinent information for the cases will be introduced before the case sheets are assigned and students will work in small groups to answer stimulus questions and administer treatment while synthesizing all of the information supplied.

Tentative Course Outline/Schedule

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02/02/15	**Exam I**	**Exam I**
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02/18/15	Exercise Physiology: Dr. Shepherd ***Lab# 4*** Cardiopulmonary Exercise Testing (CEPET)	
02/23/15	Exercise Physiology: Dr. Shepherd • Metabolic Equations • Exercise Prescription	
02/25/15	**Exam II**	**Exam II**
03/02/15	SPRING BREAK	
03/04/15	SPRING BREAK	
03/09/15	Lecture: Introduction to Therapeutic Exercise	K & C: Chapter 1
03/11/15	Lecture: Aerobic Conditioning	K & C: Chapter 7

	Lab: 6 minute walk test; sub-max step test Case Examples	
03/16/15	Lecture: Therapeutic Exercise for Mobility (ROM/Flexibility) Lab: ROM/Flexibility	K & C: Chapters 3/4
03/18/15	Lecture: Therapeutic Exercise for Mobility (Joint Mobilization) Lab: Joint Mobilization	K & C: Chapter 5
03/23/15	Lecture: Proprioceptive Neuromuscular Facilitation Lab: PNF Diagonals and facilitation techniques	K & C: 93-96; 207-214
03/25/15 ½ class at SOPT & ½ at Henderson	Lab: Mobility Principle Application (multiple case studies) Lab: Field trip to Dr. Shepherd's lab for Bod Pod demonstration	Handouts in Class
03/30/15	**Exam III** Lecture: Principles of Motor Unit Recruitment and Neurophysiology of Muscle (Sliding Filament Theory)	**EXAM III** McArdle: Chapter 18/19
04/01/15	Lecture: Therapeutic Exercise for Strengthening (isometric, concentric, eccentric training; opened vs. closed kinetic chain; plyometrics, core strengthening) Lab: Strength Training Case Examples	K & C: Chapter 6; 315-323; 432; 446-448
04/06/15	Lecture: Muscle Adaptation to Training (Hypertrophy, Atrophy, Muscle fiber/myosin heavy chain transformation, and DOMS)	McArdle: Chapter 22 Outside Readings (TBA)
04/08/15	Lecture: Therapeutic Exercise for Balance Lab: Balance Progression Age considerations	K & C: Chapter 8
04/13/15	Lecture: Special Considerations Aquatics Lecture: Special Considerations Pediatric and Geriatric Populations Lecture: Special Considerations Chronic Pain	K & C: Chapter 9; McArdle: 831-853 K & C: 325-326; 338-339
04/15/15 At OLBH	Lab: Bellefonte Pool Demonstration	
04/20/15	LAB Skill Check-offs	

04/22/15	LAB Skill Check-offs (If needed)	
04/29/15	**Exam IV**	**EXAM IV**