



Department of Kinesiology
ATR 415: Therapeutic Modalities
3 Units
Fall 2016

Meeting days: Tuesday, Thursdays	Instructor: Nicole Cosby, PhD, ATC
Meeting times: 8-9:25	Office phone: 1-619-849-2901
Meeting location: Kines#2	E-mail: nicolecosby@pointloma.edu
Any additional info:	Office hrs: T/TH 10-12:00
Final Exam: Tuesday, Dec. 12, 7:30 10:00	Canvas Login: CANVAS

PLNU Mission
To Teach ~ To Shape ~ To Send

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service becomes an expression of faith. Being of Wesleyan heritage, we aspire to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

COURSE DESCRIPTION and AIM

This course aims to provide you with in-depth study and eventual mastery of the knowledge and skills you will need as a health professional to apply the appropriate therapeutic modalities based on the recent evidence to treat musculoskeletal pathologies in an athletic population. Students will learn how to select and apply the following therapeutic modalities based on sound judgment and evidence:

- ✓ **Thermal Modalities**
- ✓ **Electrical Modalities**
- ✓ **Therapeutic Ultrasound**
- ✓ **Manual Therapies**
- ✓ **Biofeedback**

In the process, you will develop an emerging mastery of the Educational Competencies of the NATA's Educational Council (See Appendix D for details on these Competencies in preparation for the Board of Certification Examination for Athletic Trainers)

To be successful in this course, students must synthesize the most current evidence presented in class, lecture and through written research projects and apply it in the clinical setting. This means that students will be called to be active in their learning, always seeking the best evidence and constantly questioning their application of therapeutic modalities. Where possible, we will do activities in class or have study sessions to improve your retention. Graded assignments (e.g., tests, quizzes, assessment outlines and review of literature paper) will be used to help students identify, recall, synthesize and apply the key concepts in therapeutic modalities and pharmacology.

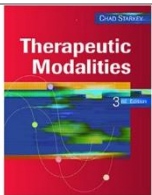
STUDENT LEARNING OUTCOMES

Upon completing this course, you should be able to:

- Utilize and apply the appropriate therapeutic modality to musculoskeletal injuries.

- Appreciate the importance of the role of therapeutic modalities in the treatment of athletic injuries.
- Describe and understand the parameters, settings, indications and contraindications of the therapeutic modalities learned in this class.
- Critically think and problem solve using the most recent evidence based medicine
- Through laboratory sessions, practice and become proficient in the clinical applications of therapeutic modalities in an athletic population.
- Pass each therapeutic modality lab practical with an 80% or better.

REQUIRED TEXTS AND RECOMMENDED RESOURCES

	Title	Therapeutic Modalities (4th edition)
	Author	Chad Starkey
	ISBN	978-0-8036-1139-9
	Publisher	F. A. Davis Company
	Publication Date	September 1, 2009

FINAL EXAMINATION POLICY

Successful completion of this class requires taking the final examination **on its scheduled day**. The final examination schedule is posted on the [Class Schedules](#) site. No requests for early examinations or alternative days will be approved.

PLNU COPYRIGHT POLICY

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

PLNU ACADEMIC HONESTY POLICY

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See [Academic Policies](#) for definitions of kinds of academic dishonesty and for further policy information.

PLNU ACADEMIC ACCOMMODATIONS POLICY

If you have a diagnosed disability, please contact PLNU's Disability Resource Center (DRC) within the first two weeks of class to demonstrate need and to register for accommodation by phone at 619-849-2486 or by e-mail at DRC@pointloma.edu. See [Disability Resource Center](#) for additional information.

PLNU ATTENDANCE AND PARTICIPATION POLICY

Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. See [Academic Policies](#) in the Undergraduate Academic Catalog.

ACTIVE LEARNING AND EVIDENCE BASED MEDICINE

Active Learning

Your active participation in this class will be required. You will be responsible for your own learning by reviewing class material before and after class. I will guide you in this process; however, in the end the onus of learning will be your responsibility. **Become intrinsically motivated to improve yourself and your understanding of therapeutic modality treatments** and techniques; if you do this you will succeed every time.

Here are some KEYS to success:

- o EFFORT (Work hard)
- o APPROACH (Work smart)
- o ATTITUDE (Think positively)

Evidence Based Medicine

Evidence based medicine (EBM) is the integration of clinically relevant research, clinical skills and experience, and patient preferences and values (Sackett et al 2000). The increased awareness **and focus on the practice of Evidence Based Medicine comes from our daily need for valid information about diagnosis, prognosis, therapy, and prevention.** We want to ask local questions about the effectiveness of therapeutic modalities and design ways to find answers. The EBM portion of this course is **designed so students can explore therapeutic modalities commonly used in the athletic training setting** and determine what **evidence is available to support their current uses.**

COURSE REQUIREMENTS

**Please Note: The PLNU Catalog states that 1 semester unit represents an hour of class per week, and 2 hours of preparation are normal for each hour of class. Therefore, if you spend about 6 hrs per week outside of class in preparation, you will significantly increase your chances of doing well!*

Course Assignments

A. Discussion Boards (10 points each)

We will utilize the Discussion Board feature of canvas to expand upon topics raised during class and from your reading of the textbook and outside journals. You will have the opportunity, via the Discussion Boards, to interact with your fellow students and with me and to discuss topics of interest to you. You are invited to become engaged with others in this class as you debate issues raised in the questions, examine and analyze case studies related to the content, and respond to the comments of your classmates.

For each Discussion Board topic, you will be required to post one response of your own (must be at least 500 words) and to post a reply to at least 2 of your classmate's posts (Must be at least 300 words). Thus, you must respond at least **twice** to each Discussion Board topic on canvas. Your response to a classmate's post may include one or more of the following:

- Ask a probing question
- Share an insight from having read your classmate's post
- Offer and provide evidence to support an opinion
- Validate a classmate's idea with reference to your own experiences
- Make a suggestion for improvement
- Expand on your classmate's post.

To **receive full credit for your participation**, your posts **MUST** also be **MADE IN A TIMELY WAY**. Specifically, this means that you must post a response during the week after we first encounter a new chapter or topic. So, for instance, if we first start discussing the Ankle on March 1st, then you will need to make your posts on the Learning Discussion Board topic(s) by March 8th in order to receive full credit.

I will review the input that you have given to these Discussion Boards and will award up to 10 points for each Discussion Board posting that you have made. **THE PROVISION OF 10 POINTS FOR YOUR POSTING WILL BE BASED ON THE QUALITY OF YOUR POST.**

B. Journal Article Reviews (30 points each)

An article will be given to students to evaluate and analyze. The article will contain important findings or conclusions relative to current topics discussed in lecture and tested in lab. The reviews should be 1-2 pages in length (double spaced, 12 pt. font, Times New Roman or equivalent).

Journal article reviews should include the following information:

- Purpose
- Hypothesis
- Methods
- Results
- conclusions
- What were the significant findings and implications?
- Strengths and weaknesses of article?
- Would you recommend the article to be used again?

C. Group Project – Sales Person for an Assigned Modality (50 points)

In groups of 2 or 3, students will be assigned an electrical modality (TBA by professor) in which they must research and become the sales person for their assigned modality. Groups will be responsible for providing the class with a rationale for why we should buy the modality that they are selling. This discussion/in promptu should include the following information but not be limited to:

Waveform, types of musculoskeletal injuries that can be treated with the assigned modality, any negatives or contraindications for the companies selected modality and then provide a justified (research based) argument for we should buy your product. Should be no longer than 10 minutes in length!

D. Electricity Labeling Handout – (30 points)

Students will be responsible for turning in a handout which details and labels all of the electrical parameters. See handout for more details

E. Electricity Parameter Handout – (30 points)

Students will be responsible for turning in a handout which details parameters that might be used for patients with specific pathologies: acute inflammation, chronic inflammation, acute pain, chronic pain, spasm etc. Handout will be given to students and students will be responsible for providing the appropriate information:

- Name of modality
- Waveform
- Frequency (be specific don't just say high or low)
- Treatment time
- Etc

F. Clinical Interpretation and Synthesis Research Paper – 100 points)

Students will be responsible for finding 5 full length research articles within the last 2-3 years on the treatment effects of ice or heat or compression as it relates to one of the following topics:

- Pain
- Inflammation/Swelling

Your research paper should include the following:

- Introduction to the modality and its common uses
- Science of the modality – physics and physiology
- Clinical question using P.I.C.O
- Provide a brief discussion on the five articles and the results
- Provide the clinical bottom line or recommendation based on the synthesis of the 5 articles
- Conclusions and recommendations to clinicians currently using the modality in their practice

AMA writing style should be used. The case report should include three references (in addition to your text or supplemental reading) no more than 10 years old that support your use of the

treatment outline. Only one resource should be an Internet website. The paper should be roughly 3-5 pages, double-spaced, 12 pt. font.

Course Exams

Lecture Exams (100 points each)

The exams will be designed to test the students' comprehension of the material presented via lectures and independent studying of the textbook. Questions will include: multiple choice, fill in the blank, matching, true/false, short answer, and clinical application and essay formats.

Final Exam (150 points)

The final exam will be cumulative and summative. Information ONLY from the modalities portion of this class will be tested.

Lab Practicals

- | | |
|---|---|
| <ul style="list-style-type: none"> a. Traction b. Ultrasound c. Massage d. Electrical stimulation e. T.E.N.S. f. M.E.N.S. g. Intermittent compressions h. Paraffin bath i. Hot whirlpool j. Hydrocollator | <ul style="list-style-type: none"> k. Cold whirlpool l. Biofeedback m. EMG n. Laser o. Iontophoresis p. U.V. q. Diathermy r. Heat s. Cold t. Orthotic therapy |
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ASSESSMENT AND GRADING

A. Discussion Boards	20
B. Journal Article Review	30
C. Group Projects – Sales	50
D. Electricity Labeling Handout	50
E. Electricity Parameter Handout	50
F. Clinical Interpretation Research Paper	100
G. Equizzes not to exceed 5@10 pts each	50
H. Examinations 3@100 pts each	300
I. Final exam/Group Rehab. Project	150
TOTAL	800

All assignments are due at the beginning of the class period in which they were assigned. Classes missed due to athletic events, planned family functions or athletic training assignments must be planned and arranged with the professor before class.

NOTE: It is your responsibility to maintain your class schedule. Should the need arise to drop this course (personal emergencies, poor performance, etc.), you have responsibility to follow through (provided the drop date meets the stated calendar deadline established by the university), not the instructor.

Therapeutic Modalities Course Schedule ****Subject to Change*****

Topic	Assignments Due	Required Reading
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Introduction; The Injury Response		
Injury Response, Physiology of Pain	Reading from Dr. Cosby's Handout	
Physiology of Pain/Pain Theories	DB Post #1 Due "which pain theory would you want to be and why?"	
Physiology of Pain/Pain Theories		
Physiology of Pain/Pain Theories		
Exam #1		
Thermal Modalities - Heat/Cold		
Thermal Modalities - Heat/Cold		
Lab: Thermal Modalities (Dr. Ganz, TA) - Please meet in the Athletic Training Clinic		
Intermittent Compression, Game Ready and other compression devices		
Lab: Intermittent Compression, Game Ready and other compression devices		
Ultrasound	DB Post #2 "US is it: overrated, overused, abused or a good clinical tool?"	
Ultrasound		
Lab: Ultrasound/Phonophoresis (Dr. Ganz, TA) - Please meet in the Athletic Training Clinic		
Exam #2		
Lab Practical #1		http://www.youtube.com/watch?v=gB3A0bADPb8
Physics of Electricity	Electricity Handout Due	
Electrotherapy: IFC, Premod, Russian, Biphasic	Sales Person Pitch Presentations #1a	
Electrotherapy: IFC, Premod, Russian, Biphasic	Sales Person Pitch Presentations #1b	
Electrotherapy: TENS, Hi-Volt	Sales Person Pitch Presentations #2	
	Article Critique #1 (see articles to choose from on eclass)	
Electrotherapy: Ionto, micro, combo	Sales Person Pitch Presentations #3	
Lab: Electrotherapy (Dr. Ganz, TA)	Due electricity parameter sheet handout	
NO CLASS FALL BREAK		
Lab: Electrotherapy (Dr. Ganz, TA)		
Exam #3		
Lab Practical #2		
Lab: Traction, Biofeedback, EMG, Intermittent Compression (Dr. Ganz, TA)	Synthesis and Interpretation Paper Due	
Lab: Traction, Biofeedback, EMG, Intermittent Compression (Dr. Ganz, TA)		
Lab: Massage, Active Release, Kinesio taping (Dr. Ganz, TA)		
Lab: Massage, Active Release, Kinesio taping (Dr. Ganz, TA)		
Lab Practical #3		
FINAL EXAMINATION 7:30-10:00		

Code	Description
ATR 415	Therapeutic Modalities & Pharmacology
AC-31	Assist the patient in the use of a nebulizer treatment for an asthmatic attack.
AC-32	Determine when use of a metered-dosed inhaler is warranted based on a patient's condition.
AC-33	Instruct a patient in the use of a meter-dosed inhaler in the presence of asthma-related bronchospasm.
AC-36i	asthma attacks
AC-36n	toxic drug overdoses
AC-38	Apply appropriate immediate treatment to protect the injured area and minimize the effects of hypoxic and enzymatic injury.
EBP-9	Use standard criteria or developed scales (eg, Physiotherapy Evidence Database Scale [PEDro], Oxford Centre for Evidence Based Medicine Scale) to critically appraise the structure, rigor, and overall quality of research studies.
PHP-17	Explain the etiology and prevention guidelines associated with the leading causes of sudden death during physical activity, including but not limited to:
PHP-17b	Asthma
PHP-48	Explain the known usage patterns, general effects, and short- and long-term adverse effects for the commonly used dietary supplements, performance enhancing drugs, and recreational drugs.
PHP-49	Identify which therapeutic drugs, supplements, and performance-enhancing substances are banned by sport and/or workplace organizations in order to properly advise clients/patients about possible disqualification and other consequences.
TI-1	Describe and differentiate the physiological and pathophysiological responses to inflammatory and non-inflammatory conditions and the influence of these responses on the design, implementation, and progression of a therapeutic intervention.
TI-2	Compare and contrast contemporary theories of pain perception and pain modulation.
TI-3	Differentiate between palliative and primary pain-control interventions.
TI-5	Compare and contrast the variations in the physiological response to injury and healing across the lifespan.
TI-8	Explain the theory and principles relating to expected physiological response(s) during and following therapeutic interventions.
TI-9	Describe the laws of physics that (1) underlay the application of thermal, mechanical, electromagnetic, and acoustic energy to the body and (2) form the foundation for the development of therapeutic interventions (eg, stress-strain, leverage, thermodynamics, energy transmission and attenuation, electricity).
TI-11	Design therapeutic interventions to meet specified treatment goals.
TI-11a	Assess the patient to identify indications, contraindications, and precautions applicable to the intended intervention.
TI-11b	Position and prepare the patient for various therapeutic interventions.
TI-11e	Apply the intervention, using parameters appropriate to the intended outcome.
TI-13	Describe the relationship between the application of therapeutic modalities and the incorporation of active and passive exercise and/or manual therapies, including, therapeutic massage, myofascial techniques, and muscle energy techniques.
TI-14	Describe the use of joint mobilization in pain reduction and restoration of joint mobility.

TI-19	Identify manufacturer, institutional, state, and/or federal standards that influence approval, operation, inspection, maintenance and safe application of therapeutic modalities and rehabilitation equipment.
TI-21	Explain the federal, state, and local laws, regulations and procedures for the proper storage, disposal, transportation, dispensing (administering where appropriate), and documentation associated with commonly used prescription and nonprescription medications.
TI-22	Identify and use appropriate pharmaceutical terminology for management of medications, inventory control, and reporting of pharmacological agents commonly used in an athletic training facility.
TI-23	Use an electronic drug resource to locate and identify indications, contraindications, precautions, and adverse reactions for common prescription and nonprescription medications.
TI-24	Explain the major concepts of pharmacokinetics and the influence that exercise might have on these processes.
TI-25	Explain the concepts related to bioavailability, half-life, and bioequivalence (including the relationship between generic and brand name drugs) and their relevance to the patient, the choice of medication, and the dosing schedule.
TI-26	Explain the pharmacodynamic principles of receptor theory, dose-response relationship, placebo effect, potency and drug interactions as they relate to the mechanism of drug action and therapeutic effectiveness.
TI-27	Describe the common routes used to administer medications and their advantages and disadvantages.
TI-28	Properly assist and/or instruct the patient in the proper use, cleaning, and storage of drugs commonly delivered by metered dose inhalers, nebulizers, insulin pumps, or other parenteral routes as prescribed by the physician.
TI-28a	metered dose inhalers
TI-28b	nebulizers
TI-28c	insulin pumps
TI-29	Describe how common pharmacological agents influence pain and healing and their influence on various therapeutic interventions.
TI-30	Explain the general therapeutic strategy, including drug categories used for treatment, desired treatment outcomes, and typical duration of treatment, for the following common diseases and conditions: asthma, diabetes, hypertension, infections, depression, GERD, allergies, pain, inflammation, and the common cold.
TI-31	Optimize therapeutic outcomes by communicating with patients and/or appropriate healthcare professionals regarding compliance issues, drug interactions, adverse drug reactions, and sub-optimal therapy.