Therapeutic Modalities  
KIN 4345

**Instructor:** Sherry Ann Miller, MS, ATC, LAT  
**Term:** Fall 2019  
**Office:** Center for Human Performance Room 104; 942-2173/486-6171  
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**Office Hours:** Monday & Wednesday: 12:00 pm – 2:00 pm; Tuesday: 11:00 am – 12:00 pm; Thursday: 11:00 am to 2:00 pm.

**Class Schedule:** Monday, Wednesday, and Friday - 11:00 to 11:50 am in KIN 143  
**Required Text:** Therapeutic Modalities: The Art and Science, 2nd ed., Knight & Draper, Lippincott Williams & Wilkins, 2013

Additional text: Principles of Pharmacology for Athletic Trainers, 3rd ed., Houglum, Harrelson & Seefeldt, SLACK, Inc., 2016. (You may purchase the ebook and/or a used copy from where ever you find to be the least expensive site).

**Course Description:** This course is designed to study theories, applications and methods of various modalities consisting of: cryotherapy, thermotherapy, electrotherapy, acoustic therapy, compression, traction, and massage in addition to therapeutic medications used in sports medicine.

**Course Objectives:**
1. Describe the physiological events associated with the different phases of the healing process and specific modalities for effective use during each phase with a rationale for their use.
2. Describe pain by definition and classification along with information about painful stimuli.
3. Describe characteristics of sensory receptors and neurophysiological mechanisms for pain control by the use of therapeutic modalities.
4. Describe the principles of electricity and the characteristics of currents.
5. Discuss principles relating to the electromagnetic and acoustic spectra.
6. Describe the parameters and clinical set-up for various therapeutic modalities.
7. Describe the physiological responses and clinical applications of electrical stimulation, iontophoresis, biofeedback, diathermy, infrared modalities, ultrasound, spinal traction, intermittent compression, and massage.
8. Describe the basic physics relating to therapeutic modalities.
9. Describe the use of therapeutic modalities for reduction of acute/chronic inflammation, muscle re-education, muscle pump contraction, retardation of atrophy, muscle strengthening, increasing range of motion, and reducing edema/swelling.
10. Describe the indications and contraindication of electrical stimulation, iontophoresis, biofeedback, diathermy, infrared modalities, ultrasound, spinal traction, intermittent compression, and massage.
11. Relate the findings of a physical examination to determine the appropriate course of treatment.
12. Demonstrate the ability to apply therapeutic modalities for cryotherapy, thermotherapy, electrotherapy, ultrasound, traction, intermittent compression, and massage.
13. Demonstrate the ability to set-up and apply the following types of electrical stimulation:  
   - Monophasic stimulator (high volt stimulation)  
   - Biphasic stimulator (Transcutaneous Electrical Nerve Stimulation – TENS, Neuromuscular Electrical Stimulation – NMES)  
   - Direct current (iontophoresis)  
   - Alternating current (interferential NMES)  
   - Multi-functional electrical stimulation devices
14. Demonstrate the ability to select the appropriate parameters for, and then prepare and apply with cryotherapy, thermotherapy, electrotherapy, and ultrasound.
15. Demonstrate the ability to select the appropriate parameter for, and then prepare and apply intermittent compression to the upper and lower extremities.
16. Demonstrate the ability to prepare and apply a massage treatment using various massage strokes.
17. Recognize concepts related to non-prescription, prescription, and classified pharmaceuticals, to include tracking, documentation, storage, disposal, dispensing, and transportation issues.
18. Identify terminology and abbreviations as they relate to pharmaceutical preparations.
19. Use the PDR to search for information on commonly prescribed medications.
20. Identify the indications, contraindications, precautions, adverse reactions, co-interactions of appropriate drug use. This will include cortical and anabolic steroids, androgenics, anti-inflammatory, analgesics, bronchodilators, antibiotics, gastrointestinal medications, anaphylaxis medications, beta-blockers, hypertensives, topical ointments, and regulated and non-regulated performance enhancing substances.
21. Appreciate the role of prevailing laws, regulations, and appropriate regulatory agencies and associations as to the use, storage, transportation, approval, recall, and dispensation of pharmaceuticals.

**Attendance Policy:** Students are expected to be present for all class meeting of this course 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 (2) 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 (3) tardies count as one (1) absence. After the second unexcused absence, ten (10) points will be deducted from the final point total for each unexcused absence. Please understand that being late to class 15 minutes and beyond will be counted as an 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 instructors have several expectations for you, the student, while in this course.

1. Professional behavior and language are required. Profanity is not acceptable as 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 to do homework and/or take exams.
5. Please be dressed appropriately for class especially on days we do activities.
6. It is your responsibility to report missing grades on Blackboard immediately. Waiting until the end of the semester is not 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 and/or you are "on" your phone during class time, you will be counted as absence.
8. All assignments are due at the beginning of class and/or e-mailed to the instructor before or by 11 am. 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.

**Course requirements:**

**Written Exams:**
1. Each student must successfully pass 4 examinations for 500 points total.
2. Each exam will be in the format of: multiple choice, true/false, matching, fill in the blank, short answer, and essay. Each examination will consist of a different format.
3. The final written examination is worth 200 points and is comprehensive.

**Assignments:**
4. Case studies due for each chapter assigned. Total point value is 160. Each is worth 20 points for a total of eight (8) studies total.
5. Article critiques: 11 critiques at 20 points each – 220 points total
Lab Practicals:
6. Each student must successfully pass 2 practical examinations.
7. Each practical exam will be in the format of: oral short answers, hands on demonstrations, and mock scenarios.
8. Each practical exam is worth 100 points.

Laboratories:
9. Each student must successfully complete each lab activity. Each laboratory activity is worth 20 points for a total of 220 points. Laboratory assignments and examinations must be successfully completed, as your total points earned in lab will be combined with lecture for a complete modalities grade.
10. Missed lab activities must be made up on the students’ own time.
11. Regular course attendance correlates with success. Therefore, no make-up exams and/or quizzes will be allowed unless prior arrangements have been made with the instructor.

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 the clinical skill assessments, you will be suspended from clinical hours in which will jeopardize your grade and date of graduation.
12. Clinical Hours – 100 points
13. Clinical Skill Assessments: 7 @ 25 points each. 175 points total. It is required that you pass 80% of the skill assessment in order to progress to the next assessment.

Clinical Hours: Clinical Skill Assessment:
240-300 hours 100 points 90-100% of assessment correct 25 points
165-239 hours 70 points 80-89.99% of assessment correct 20 points
105-164 hours 40 points 70-79.99% of assessment correct 15 points
45-104 hours 10 points 60-69.99% of assessment correct 10 points
0-44 hours 0 points 59.99% and below 0 points

Grading Procedures: A grading range will be used based off of the approximate point totals for lecture and lab combined. The approximation of total points is 1500.

A = 1350 – 1500
B= 1200 – 1349.999
C = 1050 – 1199.999
D = 900 – 1049.999
F = 750 – 899.999

Athletic Training Specialization: A grading range will be used based off of the approximate point totals for lecture, lab, clinical hours, and clinical skill assessments combined. The approximation of total points is 1775.

A = 1597.5 – 1775
B= 1420 – 1597.499
C = 1242.5 – 1419.999
D = 1065 – 1242.499
F = 887.5 – 1064.999

All athletic training specialization students must pass the course with a “C” or better in order to progress to the next course.

Daily Lecture and Lab Schedule:

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Assignments Due</th>
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<tbody>
<tr>
<td>August 26</td>
<td>Introduction and course expectations</td>
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<tr>
<td>August 28</td>
<td>Knight &amp; Draper: Ch. 1: Therapeutic Modalities: What They Are and Why They Are Used;</td>
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<tr>
<td>August 30</td>
<td>Knight and Draper: Ch. 3: General Application Procedures, and Ch. 4: Injury Record Keeping; Lab 1</td>
<td>Lab 1 due</td>
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<tr>
<td>September 2</td>
<td>University Holiday</td>
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<tr>
<td>September 4</td>
<td>Knight and Draper: Ch. 5: Tissue Response to Injury: Inflammation, Swelling, and Edema</td>
<td>Lab 1 due</td>
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<tr>
<td>September 6</td>
<td>Knight and Draper: Ch. 7: The Healing Process; Starkey: Ch. 1: The Injury Response Process</td>
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<tr>
<td>Date</td>
<td>Assignment</td>
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<td>September 9</td>
<td>Knight and Draper: Ch. 6: Immediate Care of Acute Orthopedic Injuries</td>
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<td>September 11</td>
<td>Starkey: Ch. 2: The Physiology and Psychology of Pain</td>
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<td>September 13</td>
<td>Knight and Draper: Ch. 8: Understanding Pain and Its Relationship to Injury</td>
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<td>September 16</td>
<td>Knight and Draper: Ch. 9: Relieving Orthopedic Injury Pain; Lab 2</td>
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<td>September 18</td>
<td>Article Critique (AC) 1</td>
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<td>September 20</td>
<td>Lab 2 due</td>
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<td>September 23</td>
<td>AC 2</td>
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<tr>
<td>September 25</td>
<td>Lab 5 Case study – Thermotherapy</td>
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<tr>
<td>September 27</td>
<td>Lab 5 due</td>
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<tr>
<td>September 30</td>
<td>Lab 5 due</td>
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<tr>
<td>October 2</td>
<td>Lab 4 Case study – Cryotherapy</td>
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<tr>
<td>October 4</td>
<td>Lab 4 due</td>
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<td>October 7</td>
<td>Lab 6 AC 4/Case study - Ultrasound</td>
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<tr>
<td>October 9</td>
<td>Written Exam Two</td>
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<tr>
<td>October 11</td>
<td>Lab 6 due</td>
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<td>October 14</td>
<td>Case study – electrical stimulation</td>
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<tr>
<td>October 16</td>
<td>Lab 6 due</td>
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<tr>
<td>October 18</td>
<td>AC 6</td>
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<tr>
<td>October 21</td>
<td>Lab 9 Lab 8 due</td>
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<td>October 23</td>
<td>Lab 9; Lab 10 AC 8</td>
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<td>October 25</td>
<td>Lab 11 Lab 10 due</td>
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<td>October 30</td>
<td>Lab – midterm practical Case study – Massage</td>
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<td>November 1</td>
<td>Starkey: Ch. 16: Cervical &amp; Lumbar Traction; Knight &amp; Draper: Ch. 19: Spinal Traction AC 10; Lab 11 due</td>
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<td>November 4</td>
<td>Lab 12 AC 9</td>
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<td>November 6</td>
<td>Lab 13 AC 11 Case study – Traction; Lab 12 due</td>
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<td>November 8</td>
<td>Lab 13 AC 11 Case study – Intermittent Compression</td>
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<td>November 11</td>
<td>Written Exam Three</td>
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Case Study:
- Create an injury/case/situation whose best treatment option encompasses that topic of the day.
- Write the scenario out including athlete’s subjective, objective, and assessment. The plan would be the desired treatment.
- It has to be written in such a way that your chosen modality would be the only treatment of choice.
- You need to include which modality you wrote your case for and the rational for using that modality.

During volleyball practice, you watch a player dive for a ball. She is slow to stand and is staring at her hand and moving it slowly. She approaches you immediately. She complains of pain and inability to make a fist. She says her hand is “tight, like from swelling”. You observe a red, visible tumor over her 2nd MCP joint, which is point tender. Her AROM is limited by pain and swelling. PROM is limited by swelling.

Methods of treatment most appropriate for this athlete:
- Whirlpool for comfort and to affect the whole hand

Why:
- For vasoconstriction immediately following an acute injury
- To decrease pain and muscle spasm
- To decrease the rate of secondary cell death due to hypoxia and the production of cellular waste

Parameters:
- Time: 10-20 minutes is the guideline; in this case, 10-15 minutes due to the superficial nature of the injury and the hand.
- Skin Temp: 57 degrees for optimal decrease in local blood flow, 58 degrees for analgesia

Physiological effects of the chosen modality on pain:
- Local decrease in free nerve ending sensitivity
- Increase in the threshold for nerve firing
- Slowing of synaptic activity
- Disruption of the pain-spasm-pain cycle through analgesia
Article Critiques:
There are 11 topics that you will read and critique an article pertaining to that topic. The critiques are worth 20 points each.

1. Find a referenced journal article (e.g.: Journal of Athletic Training) pertaining to the topic to be covered
2. READ the entire ARTICLE, not just the abstract
3. Summarize the article in 1-3 paragraphs at least 400 words minimal; then reflect on the article. What did you learn? What made sense? What did you not understand or was confusing? What did you agree or disagree with? How will you incorporate the information into practice?
4. Turn in at least 1 full page, typed.
5. Provide a cover sheet with your name and topic of article critique.
6. At top of page of your article critique in APA format list the article citation.
7. The journal article must be from 2002 to present.
8. The critique must be emailed to the instructor before 8 am on the due date.


Article 1: Pain Perception
Article 2: Thermotherapy
Article 3: Cryotherapy
Article 4: Ultrasound
Article 5: Phonophoresis
Article 6: Electrical stimulation
Article 7: Electrical stimulation (in combination with ultrasound)
Article 8: Iontophoresis
Article 9: Spinal traction
Article 10: Massage
Article 11: Intermittent compression