San José State University
CASA/Kinesiology
KIN 273, Evidence-Based Research in the Practice of Therapeutic Modalities
Spring, 2017

Course and Contact Information

Instructor: Masaaki Tsuruike, PhD, ATC
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Telephone: (408) 924-3040
Email: masaaki.tsuruike@sjsu.edu
Office Hours: Tues and Wed: 3:30 – 4:30 pm
Class Days/Time: Tuesday 7 - 8:50 pm
Classroom: YUH 128

Prerequisites: This course is intended for graduate students who have completed CAATE undergraduate programs and passed the board of certification examination (ATC). Other students must obtain the instructor's permission to enroll in the class.

Course Format
Course materials such as syllabus, handouts, notes, and assignment instructions can be found on the Canvas learning management system used at SJSU. You are responsible for changing the settings so that e-mail that is sent to your Canvas account is forwarded to your regularly used email account. Announcements will be posted on Canvas and should be checked on a regular basis; students may choose to be alerted via text or email that announcements have been made.

Course Description
An advanced course designed to critically evaluate the scientific and philosophical bases of therapeutic modality use. The course is intended to provide the student with the information necessary to perform prudent clinical applications of therapeutic modalities on orthopedic injuries.
Specifically, content will include current concepts and literature on the neurophysiological healing process in soft and connective tissues, pain perception mechanisms, differences in scar and adhesion formation, and muscle spasm. The efficacy of traditional and non-traditional therapeutic modalities will be discussed, including the use of special instruments to mobilize the fascia beneath the skin.

Department of Kinesiology Graduate Program Learning Outcomes (GPLO)
Upon completion of the Master’s degree program in the Department of Kinesiology, students should be able to:
1. Demonstrate the ability to conduct and critique research using theoretical and applied knowledge.
2. Interpret and apply research findings to a variety of disciplines within Kinesiology.
3. Effectively communicate essential theories, scientific applications, and ethical considerations in each student's Kinesiology program concentration.
4. Interpret and apply research findings through acquired skills in order to become agents of change to address issues in Kinesiology through the application of knowledge and research.

Graduate Athletic Training Education Program Learning Outcomes (GATEPLO)
The mission of the Graduate Athletic Training Program is to enhance the athletic training discipline through a sound theoretical and research base, as well as diversity of thought and experiences. The Graduate Athletic Training Education Program seeks to:
1. Develop critical and independent thinkers
2. Facilitate and promote community interaction/aid in sports medicine with other health care providers
3. Foster scholarly and research activities
4. Develop exemplary athletic training professionals
5. Enhance and augment athletic training skills through evidence-based exploration

Course Learning Outcomes (CLO)
Upon successful completion of this course, students will be able to:

CLO 1. Apply knowledge to manage peripheral pain receptors, known as nociceptors, by using over-the-counter (OTC) medicine of nonsteroidal anti-inflammatory drugs (NSAIDs), such as Ibuprofen and Acetaminophen (Paracetamol)
CLO 2. Differentiate medications which inhibit cyclooxygenase (COX)-1 or COX-2, such as Aspirin and Celebrex, selective COX-2 inhibitor.
CLO 3. Apply knowledge of icing concept to control pro-inflammatory response
CLO 4. Understand different types of injections to control pain (corticosteroid), to facilitate pro-inflammatory response (platelet-rich plasma: PRP), and to enhance biological effects in joints (hyaluronic acid).
CLO 5. Understand the neuro- and pathophysiological basis underlying tissue healing processes, including the mechanisms of clot coagulation, angiogenesis, granulation tissues, scar formation, and remodeling of collagen fiber.
CLO 6. Demonstrate the effects of therapeutic modalities on pain perception, adhesion formation, muscle spasm, and the relationship of therapeutic exercise to the remodeling phase of the healing process.
CLO 7. Identify integration of pain controls at the spinal level, such as TENS, and through descending pathways, such as SCENAR.
CLO 8. Utilize conventional therapeutic ultrasound devices and extracorporeal shockwave therapy based on current research findings.
CLO 9. Utilize a method of local transfer or delivery of iontophoresis to temporally remedy local pain.
CLO 10. Utilize Instrument Assisted Soft Tissue Mobilization (IASTM) to stimulate the fascia, compared with utilizing a foam roller to stimulate muscle fibers.

Required Readings
Selected readings to be provided by the instructor. All readings are shown in the end of syllabus.
Course Requirements and Assignments

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five (45) hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3 at http://www.sjsu.edu/senate/docs/S12-3.pdf.

Each student will be required to:
1. Review the articles selected in each of the topics to discuss proficiency in using numerous psychomotor skills to rehabilitate various anatomical and supportive structures.
2. Participate in class discussions and hands-on practice actively.
3. Select an injury and describe its detailed intervention process, utilizing supportive literature of sound results and outcomes.
4. Present the aforementioned therapeutic intervention program and demonstrate the techniques (therapeutic modalities, interventions, etc.) to the class.
5. Critically review selected literature as evidence based practice.

Grading Information

- Exam (Take-home x 2): 40% (20% each)
- Group Discussion of therapeutic modality: 45%
- Final exam (report): 10%
- Contributions to class discussion/participation: 5%

Determination of Grades

The course is based on a percentage scale (100%). The breakdown is as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100 - 93%</td>
</tr>
<tr>
<td>A-</td>
<td>92.9 - 90%</td>
</tr>
<tr>
<td>B+</td>
<td>89.9 - 87%</td>
</tr>
<tr>
<td>B</td>
<td>86.9 - 83%</td>
</tr>
<tr>
<td>B-</td>
<td>82.9 - 80%</td>
</tr>
<tr>
<td>C+</td>
<td>79.9 - 77%</td>
</tr>
<tr>
<td>C</td>
<td>76.9 - 73%</td>
</tr>
<tr>
<td>C-</td>
<td>72.9 - 70%</td>
</tr>
<tr>
<td>D+</td>
<td>69.9 - 67%</td>
</tr>
<tr>
<td>D</td>
<td>66.9 - 63%</td>
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<tr>
<td>D-</td>
<td>62.9 - 60%</td>
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<tr>
<td>F</td>
<td>&lt;60%</td>
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</table>

Exams: 40%

Two take-home exams will be given to develop analytic and critical understanding of the topics discussed in class and to organize with writing skills. Each student will submit (upload) each of the exams to Canvas. Student will answer each of the questions as accurately and completely based on research papers referred in class as possible within the assigned space.

Grading will be based on quality of content, evidence of understanding of the study, and quality of writing (syntax, grammar, and spelling).

Each paper should be typed, single-spaced, using a 12-point (or easily readable) font and 1" margins. Less than 80% or more than the assigned space is considered too short or beyond the limitation. (GPLO 1-4) (GATEPLO 1, 3, 5) (CLO 1-6)

Group Discussion: 45%

This is part of active learning to enhance your critical thinking in the field of athletic training. You will be randomly assigned to a group to develop therapeutic modalities and interventions for three (3) clinical case studies. Each of the assignments consist of either of acute or chronic injury. The application of therapeutic modalities and interventions must be developed from a variety of viewpoints. For example, you may need to consider the effect of different interventions on pain, muscle spasm, and joint range of motion by using medication, modalities or manual...
therapy. Discuss with your group to organize the concept of therapeutic modalities for the case each time. Also, each of the groups develop the report along with evidence based practice. You may use the articles reviewed in the beginning of course. (15 pts each) (CLO 1-10)

*This assignment requires active learning. All students are expected to participate in group discussions. More than two absences will affect your group discussion points (45%). Students who must miss class due to their clinical duties, such as traveling with a team, may make up the class absence by submitting (uploading) the assignment individually only if the student asks at least 1 week prior to the class that will be missed. However, no more than two assignments are given to make up in this assignment. You may use the articles reviewed in the beginning of course.

**Final Exam (15%):**

The final exam requires each student to individually summarize group discussions, citing at least 5 references from relevant, peer-reviewed journal articles. You may cite the articles discussed in class. (CLO 1-10)

**Contributions to class discussion/participation (5%):**

The class plans to make two (2) field trips to learn different clinical settings, such chiropractic and PT clinics. Students are expected to actively but respectfully participate in other clinical sites with proper clothes (such as neither denim pants nor non-athletic shirts.) Students are also expected to be interested in other health care provider’s demonstration. Students are further expected to share knowledge and skills with other students when the class visits Santa Clara University or Menlo College for practicing therapeutic modalities. No make-up will be available.

**Classroom Protocol**

- Cell phones must be set on silent mode. Computers are allowed for class-related activities only. Scanning the internet, checking or sending e-mails, and other activities not related to the course is unprofessional and distracting to others.
- No food is allowed in the class.
- The class is scheduled for 110 minutes without a break.

**University Policies (Required)**

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on the Office of Graduate and Undergraduate Programs’ Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/
Course Schedule (Subject to change with advance notice)

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/31</td>
<td>Course introduction, review of basic therapeutic modalities and pain control</td>
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<tr>
<td>2</td>
<td>2/7</td>
<td>Healing process: pro- and anti-inflammatory responses: role of platelets, neutrophils angiogenesis, macrophages, eicosanoids</td>
<td>Readings: Inflammation: 1-3, NSAIDs and Serotonin: 4-8, Muscle Injury and Repair: 9-10</td>
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<tr>
<td>4</td>
<td>2/21</td>
<td>Ultrasound application, collagen, ground substance, extracellular matrix</td>
<td>Readings: Ice and Cryotherapy: 19-22, Ultrasound and Extracorporeal Shockwave: 23-27, IFC and Iontophoresis: 28-29 Exam 1 (Due 3/7)</td>
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<tr>
<td>5</td>
<td>2/28</td>
<td>Medication and injection issues (Dr. Robert Nishime, MD)</td>
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<tr>
<td>6</td>
<td>3/7</td>
<td>Field Trip 1 - Hands-on therapeutic modalities</td>
<td></td>
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<tr>
<td>7</td>
<td>3/14</td>
<td>Field Trip 2 - Hands-on therapeutic modalities</td>
<td>Exam 2 (Due 4/4)</td>
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<tr>
<td>8</td>
<td>3/21</td>
<td>Field Trip 3 - Hands-on therapeutic modalities</td>
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<tr>
<td>9</td>
<td>3/28</td>
<td>SPRING BREAK</td>
<td></td>
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<tr>
<td>10</td>
<td>4/4</td>
<td>Field-trip 4 Hands on therapeutic modalities</td>
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<tr>
<td>11</td>
<td>4/11</td>
<td>Guest speaker (tentatively)</td>
<td></td>
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<tr>
<td>12</td>
<td>4/18</td>
<td>Manual therapy: Técnica Gavilán 1</td>
<td>Readings: Connective Tissues and Fascia: 30-32</td>
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<tr>
<td>14</td>
<td>5/2</td>
<td>Group Discussion 1 (Summary 1)</td>
<td></td>
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<tr>
<td>15</td>
<td>5/9</td>
<td>Group Discussion 2 (Summary 2)</td>
<td></td>
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<tr>
<td>16</td>
<td>5/16</td>
<td>Group Discussion 3 (Summary 3)</td>
<td></td>
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<tr>
<td>Due</td>
<td>5/23</td>
<td>Final Exam Paper</td>
<td></td>
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</tbody>
</table>

Required Texts/Readings

Inflammation

**NSAIDs and Serotonin**


**Muscle Injury and Repair**


**Platelet-Rich Plasma (PRP)**


**Corticosteroids and Hyaluronic Acid**


**Ice and Cryotherapy**


**Ultrasound and Extracorporeal Shockwave**


**IFC and Iontophoresis**

**Connective Tissues and Fascia**