San José State University  
CASA/Kinesiology  
KIN 269, Evidence-Based Research in the Practice in Management and Assessment of Injuries to the Upper Extremity, Spring, 2017

Course and Contact Information

**Instructor:** Masaaki Tsuruike, PhD, ATC  
**Office Location:** SPX 115  
**Telephone:** (408) 924-3040  
**Email:** masaaki.tsuruike@sjsu.edu  
**Office Hours:** Tues and Wed: 3:30 - 4:30 pm  
**Class Days/Time:** Wednesday 7 - 8:50 pm  
**Classroom:** YUH 128  
**Prerequisites:** Students must have the background of athletic training education or equivalent to the knowledge

Course Format

Course materials such as syllabus, handouts, notes, assignment instructions, etc. 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

The course emphasizes current practices in the orthopedic assessment and care of upper extremity and injuries to competitive athletes. The course will take a multidisciplinary approach with scientific and clinical outcomes. Also, the orthopedic assessment and care of the shoulder, elbow and wrist are discussed. The course intensively discuss the shoulder injuries for overhead athletes, scapular dyskinesis, and ulnar collateral ligament (UCL) injury and its reconstruction, known as Tommy John surgery.

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 mastery of 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:

**Shoulder and Scapula:**

CLO 1. Develop an application of appropriate research publications and current clinical research in the field of athletic training and sports medicine

CLO 2. Identify the mechanism of impingement syndrome and differentiate primary (outlet) and secondary impingement to underlying instability of the glenohumeral joint (GHJ)

CLO 3. Assess the micro-instability of GHJ as follows:
   3.1. Sulcus sign (congenital laxity)
   3.2. Subluxation-relocation test (occult instability)
   3.3. Beighton hypermobility index (congenital laxity/multidirectional instability)
   3.4. Anterior instability tests
      3.4.1. Assess the integrity of specific capsular ligament
      3.4.2. Assess the anterior band of the inferior GH ligament

CLO 4. Identify three different stages in impingement syndrome, known as Neer’s stages

CLO 5. Identify the mechanism of posterior internal impingement for overhead athletes, such as baseball pitchers.
   5.1. Assess relocation maneuver to induce the symptom

CLO 6. Identify the mechanism of the superior labrum anterior-posterior (SLAP) lesion, known as peel back effect, in overhead athletes and differentiate three (3) types of SLAP lesion
   6.1. Identify the pathologic cascade of SLAP lesion
   6.2. Differentiate the concept of acceleration and deceleration mechanism
   6.3. Identify the association with rotator cuff tears

CLO 7. Assess SLAP lesion by manually inducing the symptom, and differentiate special tests for SLAP lesion based on previous research

CLO 8. Assess scapular dyskinesis (SD) and differentiate three (3) types of SD along with normal kinesis of the scapula, categorized as the type IV.
   8.1. Physical examination of the scapula
   8.2. Identify the relationship between primary impingement syndrome and type I SD.
8.3. Identify the relationship between labral injury and type II SD.
8.4. Assess the pectoralis minor tightness leading to the internal rotation of the scapula.

CLO 9. Apply the posterior tilt of the scapula to prevent primary impingement syndrome.
CLO 10. Apply enhanced activity of the lower trapezius and serratus anterior muscle to decrease shoulder pathology.
CLO 11. Identify different types of acromion process (Type I to III), related to primary impingement syndrome.
CLO 12. Identify the adaptation of muscle flexibility of the shoulder and scapula between dominant and non-dominant arm in overhead athletes.

CLO 13. Assess the total range of motion of GHJ

13.1. Identify the relationship between glenohumeral internal rotation (GIRD) and horizontal adduction of GHJ
13.2. Demonstrate stretch techniques to improve posterior muscles of GHJ
13.3. Identify the tightness of posterior capsule of GHJ

CLO 14. Demonstrate the scapular plane in shoulder rehabilitation protocols

CLO 15. Identify the scapular position declined after acromioclavicular joint separation (not inclined clavicle)
CLO 16. Identify and assess traumatic unilateral the glenohumeral macro-instability

16.1. The Bankart lesion
16.2. The Hill-Sachs lesion
16.3. Comorbidities of macro-instability of GHJ
16.4. Functional tests
16.5. Total arm strength concept
16.6. Rehabilitation exercises

CLO 17. Identify different types of acromioclavicular joint injuries
CLO 18. Identify adhesive capsulitis with different stages and apply rehabilitative intervention to each of the stages.

18.1. Idiopathic (primary) vs. trauma/immobilized (secondary) frozen shoulder

**Elbow:**

CLO 19. Identify the functional anatomy of the ulnar collateral ligament (UCL)
CLO 20. Assess UCL injury by manually inducing the symptoms of injury as follows:

20.1. Valgus stress test
20.2. Milking maneuver and moving valgus stress test

CLO 21. Identify posteromedial osteophytes of olecranon process
CLO 22. Identify the potential risk factors of UCL injury as follows:

22.1. Mechanics possibly generating elbow valgus torque in pitching
22.2. A type of pitching ball
22.3. A type of deliveries in pitching
22.4. ROM of the elbow joint between dominant and non-dominant side in baseball pitchers
22.5. Combination of flexor-pronator strain with UCL injuries in athletes older than 30 years

CLO 23. Identify different types of UCL reconstruction, known as Tommy John surgery
CLO 24. Identify updated non-operative protocol of UCL injury
CLO 25. Utilize the outcome evaluation of post UCL reconstruction as follows:

25.1. Kerlan-Jobe Orthopaedic Clinical (KJOC) Score vs. Conway classification outcome scale

CLO 26. Apply the evidence based practice to post UCL reconstruction rehabilitation
Wrist and hand:
CLO 27. Identify carpal scaphoid fractures
CLO 28. Identify hook of the hamate fractures diagnosed from the carpal tunnel view of radiograph
CLO 29. Identify triangular fibrocartilage complex (TFCC) injury
CLO 30. Identify De Quervain’s Syndrome by using Finkelstein’s test
CLO 31. Identify extrinsic hand muscles:
   31.1. Flexor digitorum profundus and superficialis tendons
   31.2. The lumbrical muscle
CLO 32. Identify extensor tendon injuries in athletes

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 practices actively, including dissection laboratories.
3. Select an injury and understand its detailed mechanisms of overhead injuries, utilizing supportive literature of sound results and outcomes.
4. Present the aforementioned rehabilitation program for the upper extremity and demonstrate the techniques to the class.
5. Critically review selected literature.

Grading Information
- Midterm Exam: 30%
- Short Paper (Written Critique): 30%
- Final Exam (comprehensive) : 25%
- Surgery Observation Report: 10%
- Dissection Report: 5%

Determination of Grades
The course is based on a percentage scale (100%). The breakdown is as follows:
   A: 100 - 93%   A-: 92.9 - 90%
   B+: 89.9 - 87%  B: 86.9 - 83%  B-: 82.9 - 80%
   C+: 79.9 - 77%  C: 76.9 - 73%  C-: 72.9 - 70%
   D+: 69.9 - 67%  D: 66.9 - 63%  D-: 62.9 - 60%  F: <60%

Midterm Exam: 30%
There will be one midterm exam covering all materials (lectures, labs, discussions, readings, etc.) to date from ALL units discussed during the course of the spring semester up to the shoulder and scapula. The date and format of the
midterm exam are to be determined. (GPLO 1-4) (GATEPLO 1, 3) (CLO 2-17)

**Midterm Exam Date: March 15**

**Short Paper (Written Critique): 30%**

This short paper provides an opportunity to develop analytic and critical reading skills. Each student will submit a written critique (appraisal) of the articles below selected by the instructor. The appraisal includes the methods (subjects, data collection procedures if appropriate) and findings of research, and the degree of practical implication. You will first summarize the assigned article in your own words.

Grading will be based on quality of content, identification of understanding of the study and quality of writing (syntax, grammar, and spelling). (GPLO 1, 2, 4) (GATEPLO 3, 5) (CLO 1)

Each paper should be typed, double-spaced, using a 12-point (or easily readable) font and 1” margins. Each paper should not exceed one and a half pages (1 1/2). However, less than 80% are considered too short (less than 1 page)

**Reading Articles Due Date**


**Surgery Observation: 10%**

You will write a one page surgery observation report. You will be expected to observe a surgery that helps you improve the knowledge of injuries in athletics. You will write about the surgical process, thoughts, and reflection on what you observed and learned and how it all relates to the research.

You may ask the Bay Area Surgery Group Inc. for an opportunity to observe a surgery. Dr. DH Haber, Team Orthopedist of Sports Medicine, SJSU will welcome you to observe his surgery. You may also seek an opportunity of surgery observation at your clinical site. (GPL O 3) (GATEPLO 1, 2, 5)

**Dissection Reports: 5%**

You will write a one page reflection on each of the dissections. You have dissection labs with the shoulder and forearm specimens for this class. You will be expected to observe such specimens performed by an orthopedist to improve your professional knowledge and skills. No make-up lab will be available. (GPLO 3) (GATEPLO 1, 2, 4) (CLO 5, 6, 11, 15, 16, 19, 23, 27-32)

**Final Exam: 25%**

The final exam will be given to students who demonstrate mastery of course content. The exam will be comprehensive, including true-false, multiple choice, and short essay questions that require integration and synthesis of knowledge. Excellent responses will demonstrate advanced and in-depth understanding of upper extremity injury especially the elbow, wrist, and hand. Responses should include material from assigned readings and class discussions.

Exams are to be taken on the dates scheduled. Make-up exams are permitted only for illness and emergency
(TRULY EXTRAORDINARY CIRCUMSTANCES). The student is responsible for notifying the instructor and making arrangements at the earliest possible time. In most cases, the midterm exam must be completed before the next class meeting. All requests for make-up exams will be evaluated on an individual basis.

(GPLO 1-4) (GATEPLO 1, 3) (CLO 19-32)

Classroom Protocol

- All students in the class must be required to set a silent mode for your cell phone. Students are allowed to use your PC in the class. However, you are not allowed to access any unnecessary internets or emails.
- No food is allowed in the class.
- The class will basically have no 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 Office of Graduate and Undergraduate Programs’ Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/”
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Course Schedule (Subject to change with advance notice)

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
<th>Deadlines</th>
<th>Reading Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2/1</td>
<td>Course Intro; EBR/M; Functional Anatomy Review of the Shoulder</td>
<td></td>
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<tr>
<td>2</td>
<td>2/8</td>
<td>Rehabilitation of Shoulder Impingement: Primary, Secondary and Internal</td>
<td></td>
<td>Ellenbecker 2010, Reinold 2013, Guerrero 2009</td>
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<tr>
<td>3</td>
<td>2/15</td>
<td>Rehabilitation of Micro-Instability Disabled Throwing Shoulder I</td>
<td></td>
<td>Burkhart 2003a, b, c</td>
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<tr>
<td>7</td>
<td>3/15</td>
<td><strong>Midterm Exam</strong></td>
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<tr>
<td>8</td>
<td>3/22</td>
<td>Reflection of the shoulder problems, discussion with ATC for baseball (tentatively)</td>
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<tr>
<td>9</td>
<td>3/29</td>
<td><strong>Spring Break</strong></td>
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<tr>
<td>10</td>
<td>4/5</td>
<td>Injuries to Elbow, Ulnar Collateral Ligament Reconstruction (Tommy John Surgery) Rehabilitation Following Ulnar Collateral Ligament Reconstruction</td>
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<td>Hariri 2010, Gregory 2013, Cain 2010, Aguinaldo 2009, Davis 2009,</td>
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<tr>
<td>11</td>
<td>4/12</td>
<td>Rehabilitation Following TJ Surgery Injuries to Wrist &amp; Hand I</td>
<td></td>
<td>Ellenbecker 2009</td>
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<tr>
<td>12</td>
<td>4/19</td>
<td>Injuries to Wrist &amp; Hand II</td>
<td></td>
<td>McAdams 2009, Tagliafico 2009, Fufa 2013</td>
</tr>
<tr>
<td>14</td>
<td>5/3</td>
<td>Upper Extremity Cadaveric Dissections (Bay Area Surgical Center)</td>
<td>Short paper: Jones (2013)</td>
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<tr>
<td>15</td>
<td>5/10</td>
<td>Final class overview and discussion with topics of athletic injuries in the upper extremity</td>
<td>Short paper: Podesta (2013)</td>
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<tr>
<td>Final Exam</td>
<td>5/24</td>
<td><strong>Final Exam</strong></td>
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Revised in January, 2017

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Required readings

Shoulder and scapula


Internal impingement and SLAP lesion

Scapular dyskinesis

Adaptation of shoulder and scapular muscles in overhead athletes

Traumatic glenohumeral instability

Frozen shoulder

AC sprain

UCL injury and TJ surgery

**Wrist and hand**