

San José State University
CASA/Kinesiology
KIN 271, Advanced Topics in Athletic Training, Fall, 2017

Course and Contact Information

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Office Hours:	Tues and Wed: 2:30 - 3:30 pm
Class Days/Time:	Tuesday 4 - 6:50 pm
Classroom:	YUH 128
Prerequisites:	Biology 65 (Human Anatomy), Biology 66 (Human Physiology), KIN 188 (Prevention and Care of Athletic Injuries) or equivalent

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

This course is designed to improve the knowledge of clinical athletic training. Topics include: outcome research and practical applications for sports-related concussion or mild traumatic brain injury, alteration evaluation skills for movement patterns and athletic injuries, and research design in the field of athletic training. The course will take a multidisciplinary approach, incorporating scientific (research) and clinical bases.

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:

CLO 1. Understand the updated knowledge of sport-related concussion or mild traumatic brain injury (mTBI) in sports

- 1.1. The published number of athletes concussed in each of the levels
- 1.2. Human brain and behavior
 - 1.2.1. Cerebrum and the lobes of the cerebral cortex
 - 1.2.2. The supplementary motor area
 - 1.2.3. The premotor cortex
 - 1.2.4. Prefrontal lobe: decision making
 - 1.2.5. The rostro-caudal axis of the frontal lobe hierarchical
 - 1.2.6. Parietal lobe
 - 1.2.7. Temporal lobe
 - 1.2.8. Subcortical structures: Hippocampus, Basal ganglia
 - 1.2.9. Parkinson's disease
 - 1.2.10. Huntington's disease
 - 1.2.11. Alzheimer's disease
 - 1.2.12. Depression
 - 1.2.13. Working memory

CLO 2. Based on the function of human brain and behavior, evaluate somatic, cognitive, and emotional problems after mTBI to make sound decisions regarding the management of athletes with mTBI using Sport Concussion Assessment Tool (SCAT)-5th Edition.

CLO 3. Demonstrate the assessment of vestibular system, dizziness, and postural balance tests, such as Modified Balance Error Scoring System (BESS) and the Tandem Gate test

CLO 4. Demonstrate Standardized Assessment of Concussion (SAC) to identify deficits of working memory, especially anterograde amnesia in concussed athletes on the sideline.

- CLO 5. Demonstrate upper limb coordination with the index finger to nose repetitions followed by the index finger of concussed athlete to your index finger as the examiner.
- CLO 6. Demonstrate the King-Devick test to assess the relationship between oculomotor functions and learning abilities.
- CLO 7. Apply neurocognitive tests to compare the baseline of scores in the course of competitive.
- 7.1. Utilizing the paper-pencil neuropsychological test, compared with ImPACT (Immediate Post-Concussion Assessment and Cognitive Test).
- CLO 8. Demonstrate the benign paroxysmal positional vertigo or labyrinthine concussion in which rotatory vertigo or dizziness is induced as the head position is changed relative to gravity.
- CLO 9. Identify a number of concussion occurrence in the NFL, compared with collegiate or high school athletes.
- 9.1. Chronic traumatic encephalopathy (CTE)
- 9.1.1. Dementia pugilistica
- 9.1.2. Tauopathies
- 9.1.3. Tau pathology in brain tissue
- 9.1.4. Neurofibrillary tangles in the frontal neocortex
- 9.1.5. Tauopathy affecting widespread brain regions
- 9.1.6. Neurofibrillary tangles
- CLO 10. Examine physical conditioning with alternation evaluation techniques and skills for a variety of athletic injuries.
- 10.1. Demonstrate the Functional Movement Screen (FMS) test to identify the movement patterns
- 10.2. Demonstrate corrective exercises to improve the FMS scores.
- 10.3. Demonstrate the Selective Functional Movement Assessment (SFMA) to identify pain come from either deficit of the motor control or the tissue extensibility
- 10.3.1. A comparison of the concept of SFMA and traditional HOPS (history, observation, palpation, and special) tests
- 10.4. Demonstrate corrective exercises to improve the SFMA
- CLO 11. Demonstrate unloading taping techniques using a variety of tapes, such as cover rolls or Kinesio tapes

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](http://www.sjsu.edu/senate/docs/S12-3.pdf) 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%
- Class Laboratory Assignments: 50%
- Final Exam (comprehensive) : 20%

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, 5) (CLO 1-9)

Midterm Exam Date: October 3

Class Laboratory Assignments: 50%

The class provides a number of laboratory assignments regarding SRC and FMS, SFMA.

- 1) Students will explain each of the symptoms related to concussion in terms of brain function and the mechanisms which possibly induce the concussion symptom inventory for the patient with post-symptomatic free.
- 2) Students will explain positive and negative aspects for the ImPACT, compared with the paper and pencil test
- 3) Students will explain how healthcare providers utilize Balance Error Scoring System (BESS) and a tandem gait task test for post-concussed athletes with subsided symptoms.
- 4) Students will explain the mechanism of Nystagmus, the Dix–Hallpike test, and Roll test for horizontal benign paroxysmal positional vertigo (BPPV).
- 5) Students will find out how we can design the next study of SRC.
- 6) Students will explain the concept of stability, compared with mobility in movement patterns from the view point of Functional Movement Screen
- 7) Students will explain "corrective exercise," compared with conditioning exercise from the view point of Functional Movement Screen.
- 8) Students will explain the mechanism of mobility strategy techniques that improve the shoulder mobility score.
- 9) Students will explain differences in the concept of assessment between SFMA and FMS

** Each paper should be typed, **double-spaced**, using a 12-point (or easily readable) font and 1" margins. Each paper should not exceed one. However, less than 80% are considered too short (less 17 /22 lines per page) Put your name, date, and the indication of lab assignment number in the header. (*Not to put these information in the top of document.*) (GPLO 1-4) (GATEPLO 1, 3, 5) (CLO 1-10)

Final Exam: 20%

The final exam will be given to students who demonstrate mastery of course content. The exam will be comprehensive short essay questions that require integration and synthesis of knowledge with regard to the concept of FMS and SFMA as well as these corrective exercises. Excellent responses will demonstrate advanced and in-depth understanding of alternative assessment instruments compared with the traditional assessments for injuries in athletes.

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 1-5) (CLO 10)

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.
- **GATEP students must have time enough to get to the classroom each time while working as a GA at their clinical site, such as avoiding traffic jams in the evening for those driving a car from the clinical site. All of your supervisors must be aware of your class schedules, and allow you to leave for school. You are also expected to show your supervisor your class schedules clearly.*

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](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>

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Course Schedule (Subject to change with advance notice)

Week	Date	Topics	Assignments (tentatively)
1	8/29	Introduction of expected course works Updated a mild traumatic brain injury/sports-related concussion The Sport Concussion Assessment Tool 5th Edition (SCAT5) http://bjsm.bmj.com/content/bjsports/early/2017/04/26/bjsports-2017-097506SCAT5.full.pdf	Echemendia et al. Br J SM 51(11):851-858, 2017
2	9/5	Brain and Human Behavior	
3	9/12	Neuropsychological and cognitive tests for MTBI Paper and Pencil Tests ImpACT	Lab Assignment 1 Due
4	9/19	Vestibular System, Dizziness, and Postural Balance Test, Balance Error Scoring System	Lab Assignment 2 Due
5	9/26	Persistent post-concussive syndrome Chronic Traumatic Encephalopathy (CTE)	Lab Assignment 3 Due
6	10/3	Midterm	Lab Assignment 4 Due
7	10/10	Functional Movement Screen (FMS)	
8	10/17	Functional Movement Screen (FMS) II	Lab Assignment 5 Due
9	10/24	Corrective Exercises for FMS I	Lab Assignment 6 Due
10	10/31	Corrective Exercises for FMS II	Lab Assignment 7 Due
11	11/7	Selective Functional Movement Assessment	Lab Assignment 8 Due
12	11/14	Selective Functional Movement Assessment II	Lab Assignment 9 Due
13	11/21	Updated Taping Concept and Techniques	
14	11/28	Updated Taping Concept and Techniques II	
15	12/5	Corrective Exercises for SFMA	
Final Exam	12/19	Final Exam	

Readings

Below the articles related to sports-related concussion, updated by early 2017.

- 1) Alla S, Sullivan SJ, Hale L, et al. Self-report scales/checklists for the measurement of concussion symptoms: a systematic review. *British Journal of Sports Medicine*. 2009;43(Suppl 1):i3-i12.
- 2) Allen BJ, Gfeller JD. The Immediate Post-Concussion Assessment and Cognitive Testing battery and traditional neuropsychological measures: A construct and concurrent validity study. *Brain Injury*. 2011;25(2):179-191.
- 3) Bell DR, Guskiewicz KM, Clark MA, et al. Systematic Review of the Balance Error Scoring System. *Sports Health*. 2011;3(3):287-295.

- 4) Chin EY, Nelson LD, Barr WB, et al. Reliability and Validity of the Sport Concussion Assessment Tool–3 (SCAT3) in High School and Collegiate Athletes. *The American Journal of Sports Medicine*. 2016;0363546516648141.
- 5) Cordingley D, Girardin R, Reimer K, et al. Graded aerobic treadmill testing in pediatric sports-related concussion: safety, clinical use, and patient outcomes. *Journal of Neurosurgery: Pediatrics*. 2016;18(6):693-702.
- 6) Covassin T, Moran R, Elbin R. Sex Differences in Reported Concussion Injury Rates and Time Loss From Participation: An Update of the National Collegiate Athletic Association Injury Surveillance Program From 2004-2005 Through 2008-2009. *Journal of athletic training*. 2016;51(3):189-194.
- 7) Covassin T, Moran R, Wilhelm K. Concussion Symptoms and Neurocognitive Performance of High School and College Athletes Who Incur Multiple Concussions. *The American Journal of Sports Medicine*. 2013;41(12):2885-2889.
- 8) Custer A, Sufrinko A, Elbin R, et al. High baseline postconcussion symptom scores and concussion outcomes in athletes. *Journal of athletic training*. 2016;51(2):136-141.
- 9) Elbin R, Sufrinko A, Schatz P, et al. Removal from play after concussion and recovery time. *Pediatrics*. 2016;138(3):e20160910.
- 10) Guskiewicz KM, Register-Mihalik J, McCrory P, et al. Evidence-based approach to revising the SCAT2: introducing the SCAT3. *British Journal of Sports Medicine*. 2013;47(5):289-293.
- 11) Fife TD, Kalra D. Persistent vertigo and dizziness after mild traumatic brain injury. *Annals of the New York Academy of Sciences*. 2015;1343(1):97-105.
- 12) Frommer LJ, Gurka KK, Cross KM, et al. Sex differences in concussion symptoms of high school athletes. *Journal of athletic training*. 2011;46(1):76-84.
- 13) Harmon KG, Drezner JA, Gammons M, et al. American Medical Society for Sports Medicine position statement: concussion in sport. *British Journal of Sports Medicine*. 2013;47(1):15-26.
- 14) Houck Z, Asken B, Bauer R, et al. Epidemiology of sport-related concussion in an NCAA Division I Football Bowl Subdivision sample. *The American journal of sports medicine*. 2016;0363546516645070.
- 15) Imai T, Takeda N, Ikezono T, et al. Classification, diagnostic criteria and management of benign paroxysmal positional vertigo. *Auris Nasus Larynx*. 2017;44(1):1-6.
- 16) Jinguji TM, Bompadre V, Harmon KG, et al. Sport Concussion Assessment Tool–2: Baseline values for high school athletes. *British journal of sports medicine*. 2012;bjsports-2011-090526.
- 17) King D, Gissane C, Hume P, et al. The King–Devick test was useful in management of concussion in amateur rugby union and rugby league in New Zealand. *Journal of the neurological sciences*. 2015;351(1):58-64.
- 18) King D, Hume P, Gissane C, et al. Use of the King–Devick test for sideline concussion screening in junior rugby league. *Journal of the neurological sciences*. 2015;357(1):75-79.
- 19) Kontos AP, Elbin R, Lau B, et al. Posttraumatic migraine as a predictor of recovery and cognitive impairment after sport-related concussion. *The American journal of sports medicine*. 2013;0363546513488751.
- 20) Kurowski BG, Hugentobler J, Quatman-Yates C, et al. Aerobic Exercise for Adolescents With Prolonged Symptoms After Mild Traumatic Brain Injury: An Exploratory Randomized Clinical Trial. *The Journal of head trauma rehabilitation*. 2016.
- 21) Kutcher JS, McCrory P, Davis G, et al. What evidence exists for new strategies or technologies in the diagnosis of sports concussion and assessment of recovery? *British journal of sports medicine*. 2013;47(5):299-303.
- 22) Lawrence DW, Comper P, Hutchison MG. Influence of extrinsic risk factors on National Football League injury rates. *Orthopaedic journal of sports medicine*. 2016;4(3):2325967116639222.
- 23) Leddy JJ, Baker JG, Merchant A, et al. Brain or strain? Symptoms alone do not distinguish physiologic concussion from cervical/vestibular injury. *Clinical journal of sport medicine*. 2015;25(3):237-242.
- 24) Leddy JJ, Baker JG, Kozlowski K, et al. Reliability of a graded exercise test for assessing recovery from concussion. *Clinical Journal of Sport Medicine*. 2011;21(2):89-94.

- 25) McClain R. Concussion and trauma in young athletes: prevention, treatment, and return-to-play. *Primary Care: Clinics in Office Practice*. 2015;42(1):77-83.
- 26) McLeod TCV, Leach C. Psychometric properties of self-report concussion scales and checklists. *Journal of athletic training*. 2012;47(2):221-223.
- 27) McClure DJ, Zuckerman SL, Kutscher SJ, et al. Baseline neurocognitive testing in sports-related concussions the importance of a prior night's sleep. *The American journal of sports medicine*. 2013:0363546513510389.
- 28) McCrea M. Standardized mental status testing on the sideline after sport-related concussion. *Journal of athletic training*. 2001;36(3):274.
- 29) McCrory P, Meeuwisse WH, Aubry M, et al. Consensus statement on concussion in sport: the 4th International Conference on Concussion in Sport held in Zurich, November 2012. *British Journal of Sports Medicine*. 2013;47(5):250-258.
- 30) Mrazik M, Naidu D, Lebrun C, et al. Does an individual's fitness level affect baseline concussion symptoms? *Journal of athletic training*. 2013;48(5):654.
- 31) Nelson LD, Guskiewicz KM, Barr WB, et al. Age differences in recovery after sport-related concussion: a comparison of high school and collegiate athletes. *Journal of athletic training*. 2016;51(2):142-152.
- 32) Pellman EJ, Lovell MR, Viano DC, et al. Concussion in professional football: recovery of NFL and high school athletes assessed by computerized neuropsychological testing—part 12. *Neurosurgery*. 2006;58(2):263-274.
- 33) Pfister T, Pfister K, Hagel B, et al. The incidence of concussion in youth sports: a systematic review and meta-analysis. *British journal of sports medicine*. 2016;50(5):292-297.
- 34) Randolph C, Millis S, Barr WB, et al. Concussion symptom inventory: an empirically derived scale for monitoring resolution of symptoms following sport-related concussion. *Archives of Clinical Neuropsychology*. 2009:acp025.
- 35) Silver JM. Effort, exaggeration and malingering after concussion. *Journal of Neurology, Neurosurgery & Psychiatry*. 2012;83(8):836-841.
- 36) Snedden TR, Brooks MA, Hetzel S, et al. Normative Values of the Sport Concussion Assessment Tool 3 (SCAT3) in High School Athletes. *Clinical Journal of Sport Medicine*. 9000;Publish Ahead of Print.
- 37) Stewart GW, McQueen-Borden E, Bell RA, et al. Comprehensive assessment and management of athletes with sport concussion. *International Journal of Sports Physical Therapy*. 2012;7(4):433-447.
- 38) Thomas RE, Alves J, Vaska MM, et al. SCAT2 and SCAT3 scores at baseline and after sports-related mild brain injury/concussion: qualitative synthesis with weighted means. *BMJ Open Sport & Exercise Medicine*. 2016;2(1):e000095.
- 39) Valovich McLeod TC, Hale TD. Vestibular and balance issues following sport-related concussion. *Brain injury*. 2015;29(2):175-184.
- 40) Yengo-Kahn AM, Johnson DJ, Zuckerman SL, et al. Concussions in the National Football League: A Current Concepts Review. *The American Journal of Sports Medicine*. 2016;44(3):801-811.
- 41) Zuckerman SL, Kerr ZY, Yengo-Kahn A, et al. Epidemiology of sports-related concussion in NCAA athletes from 2009-2010 to 2013-2014 incidence, recurrence, and mechanisms. *The American journal of sports medicine*. 2015;43(11):2654-2662.
- 42) Zygmunt A, Stanczyk J. Methods of evaluation of autonomic nervous system function. *Archives of medical science: AMS*. 2010;6(1):11.

Functional Movement Assessment (FMS)

- 43) Bardenett SM, Micca JJ, DeNoyelles JT, et al. Functional movement screen normative values and validity in high school athletes: can the FMS™ be used as a predictor of injury? *Int J Sports Physical Therapy*. 2015;10(3):303-308.
- 44) Letafatkar A, Hadadnezhad M, Shojaedin S, et al. Relationship between Functional Movement Screening score and history of injury. *Int J Sports Physical Therapy*. 2014;9(1):21-27.

- 45) Cook G, Burton L, Hoogenboom BJ, et al. Functional Movement Screening: the use of fundamental movements as an assessment of function - PART 1. Int J Sports Physical Therapy. 2014;9(3):396-409.
- 46) Cook G, Burton L, Hoogenboom BJ, et al. Functional Movement Screening: the use of fundamental movements as an assessment of function - PART 2. Int J Sports Physical Therapy. 2014;9(4):549-563.