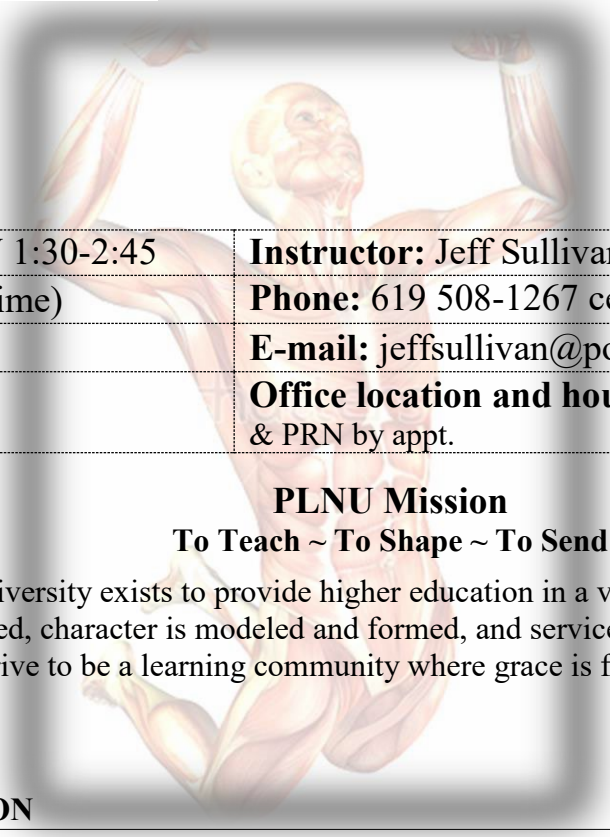
Department of Kinesiology

ATR 688: Evidence-Based OrthopedicAssessment of the Head, Spine & Upper Extremity

3 Units

Spring, 2019



Meeting days: MW 1:30-2:45	**Instructor:** Jeff Sullivan, PhD, ATC, CES
Final Exam: (day/time)	**Phone:** 619 508-1267 cell (use appropriately)
	E-mail: jeffsullivan@pointloma.edu
	Office location and hours: T 10am-12pm; R 9:30 am-10:30 & PRN by appt.

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 is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

COURSE DESCRIPTION

This course equips students to implement the S.O.A.P. method of orthopedic assessment to specific injuries of the axial skeleton, central nervous system, thorax, abdomen and upper extremity. Clinical role-playing in the lab setting will allow students to practice and master injury/illness examination through the use of the differential diagnosis process.

Course Aim

This course aims to provide you with in-depth study of the differential diagnosis process that is essential for the healthcare provider. We will study the following regions:

- *Head & Face*
- *Spine (cervical, thoracic, lumbar and sacral)*
- *Thorax and Abdomen*
- *Shoulder*
- *Elbow*
- *Wrist, Hand & Fingers*

Through class lectures, course readings and the textbook, you will be asked to engage in the critical process of differential diagnosis while conducting orthopedic assessments for the above joints. Most classes will be in a lecture format in order to enable us to cover the wide expanse of material. We will also use segments of class meetings as labs to refine your clinical assessment skills by using your colleagues as patients. This course is technology-enhanced in the sense that I've made all lecture slides, readings and discussion boards available on Canvas. You are upper division students and should

naturally be actively engaged with the course material. My goal in taking this approach is for you to take ownership of your learning and to actively seek knowledge and develop the "clinical mind" rather than being passive 'receivers of knowledge'.

*To be successful in this course, you should always take the mindset of actively synthesizing information presented in lecture and lab and applying it to the clinical setting. Specifically, this means that studying for quizzes and tests should involve reviewing and integrating the essential ideas by asking the "*Why?*" and "*So what does this mean?*" questions.

PROGRAM LEARNING OUTCOMES

1. To prepare students to demonstrate competency in interpreting evidence-based research and improving clinical standards and practice through clinical question development and research methodology
2. To prepare students to develop expertise in the athletic training domains through an integrative experiential clinical model
3. **To equip students with appropriate knowledge and educational foundation required for an entry-level Certified Athletic Trainer**
4. To prepare students to establish and understand the importance of inter-professional relationships, while collaborating with other health care professionals to become effective communicators
5. To prepare students to demonstrate preparation, knowledge and skill in the delivery of comprehensive health care to a diverse set of patients with musculoskeletal injuries and conditions and illnesses in a distinctly moral and ethical manner, integrating Christian faith with clinical practice.

COURSE LEARNING OUTCOMES

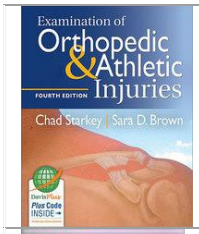
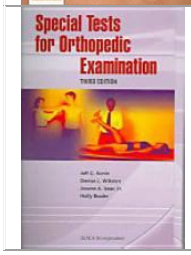
ATR 388 will prepare you to:

1. Utilize and master the components of the *orthopedic examination process* (i.e., perform a thorough History, Inspect, Palpate, and utilize Special Tests) to determine the presence of physical problems in patients.
2. Discover and execute the process of *differential diagnosis*, which involves determining which pathology—from among a variety of possible conditions—is the probable cause of an individual's symptoms.

   Note: You will create video tutorials and differential diagnosis algorithms to aid in learning the differential diagnosis process; you will edit and refine the work of your colleagues in this process.
3. Describe and appraise the etiology, symptoms, signs and management of upper extremity injuries.
4. Research, summarize and critique contemporary literature on the evaluation and management of potentially catastrophic injuries to the cervical spine and brain.
5. Through laboratory sessions, practice and become proficient in the clinical evaluation of upper extremity posture, flexibility, neurological status and muscular strength.

REQUIRED AND RECOMMENDED TEXTS

Required:

	**Title**	**Examination of Orthopedic and Athletic Injuries, 4th Ed.** (you may buy 3rd or 4th edition of this book)
	Author	Chad Starkey; Sara D. Brown
	ISBN	978-0-8036-3918-8
	Publisher	F. A. Davis Company
	Publication Date	2015
	**Title**	**Special Tests for Orthopedic Examination, 3rd edition**
	Author	Jeff G. Konin; Holly Brader; Jerome A. Isear; Denise L. Wiksten
	ISBN	ISBN 978-1-55642-741-1
	Publisher	SLACK, Inc
	Publication Date	January 28, 2006
	Price	$47.95

ASSESSMENT AND GRADING

I. DISCUSSION BOARDS

We will use discussion boards to expand upon topics raised in class or from your textbook reading or outside journals. Discussions will allow us to interact on topics of interest to go deeper into the content. 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. In the process, my hope is that you will refine each other, acting as colleagues to improve learning.

For each Discussion Board topic, you will be required to post one response of your own and also at times to post a reply to a classmate's response (e.g. the Clinical Exam Video Tutorial assignment below). Thus, you must respond at least once and sometimes 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 topic and your colleagues have posted their tutorial assignment. I will review all posts and award points based on the quality of your posts. These instructions with ground rules are also listed on Canvas.

II. CLINICAL EXAMINATION VIDEO TUTORIALS: *MANUAL MUSCLE TESTING & SPECIAL TESTS*

You will be asked to partner with a colleagues to produce a tutorial video on the Clinical Examination of a specific joint of your choosing. In your video tutorial, make sure to include an *Evidence-Based Approach*: this means you should choose to demonstrate the most clinically useful Manual Muscle Tests and Special Tests used to evaluate the joint. You will share your video tutorial with your colleagues via *YouTube* for their education and constructive feedback. You will each also comment on the other tutorials created by your colleagues via Discussion Boards on Canvas. Lastly, you will present your special testing procedures to your colleagues during the lab session that corresponds to the body region you covered in your video.

Your tutorial should include and discuss the following:

- At least 10 of the most commonly used special tests to evaluate the joint that you select.
- Demonstration of specific direction on patient positioning, direction of testing, S/S of a positive test, and pathology that each test rules in/out
- Wherever possible, comment on the psychometric properties of the special tests you choose (i.e. these properties represent the clinical usefulness of tests such as the reliability, sensitivity, specificity). *It is critical that your colleagues have a sense about which are the most clinically useful and valuable tests to choose when conducting a differential evaluation. You are the instructors in this assignment, so please consult research articles in this area since these psychometric properties are continuing to be reported on.*)
    - Indicate if a cluster of special tests might enhance your ability to diagnose a condition (e.g. SI joint tests)

*This is a helpful YouTube channel for your review: http://www.youtube.com/user/bigesor

For your tutorial, please choose 1 joint below. Remember, you will each also comment on the other tutorials via Discussion Board on Canvas.

- *Lumbar Spine*
- *Sacroliac Joint*
- *Cervical Spine*
- *Shoulder Instability and Impingement*
- *Elbow & Wrist*
- *Eyes, Ears, Throat*

III. QUIZZES

Quizzes will be accomplished through various forms: (online quiz, iPad anatomy app, partner quiz, mid-class session polling, etc) and/or through take-home assignments.

IV. PUBLIC SERVICE ANNOUNCEMENT: "BEST PRACTICES IN MANAGING SPORT-RELATED CONCUSSIONS"

MTBI is the most publicized injury in sports today. The classification, etiology, assessment and treatment of concussion in sports is currently being studied at an extremely rapid pace, with various organizations either changing their rules or considering such changes. It is essential that Athletic Trainers stay at the forefront of the most current evidence. This assignment is intended for you to create a public service announcement that effectively summarizes and communicates to a target audience the *evaluation, classification,* and *treatment* guidelines for MTBI. *Return to play criteria* that will insure patient safety should also be discussed. You may use powerpoint, narrated PPT (screencast-o-matic), video, or other media to produce and communicate your PSA. You may work in groups of 3 on this assignment. Your time limit is 10 minutes for the finished product!

Alternate assignment: read this opinion piece (current Tx of concussions from a Neurologist's perspective) and identify at least two remaining questions you have, then present a PSA that addresses the questions.

***In preparation for this assignment, please review the following links (there are many more that will be given in class or in the course reader on eclass)
http://www.nata.org/jat/readers/archives/40.3/i1062-6050-40-3-153.pdf
http://www.nata.org/jat/readers/archives/41.2/i1062-6050-41-2-137.pdf
http://www.nata.org/statements/position/concussion.pdf

V. LECTURE EXAMS

We will have unit examinations to measure your mastery of the material. The final exam will be comprehensive and will require that you have a firm grasp of the orthopedic evaluation process for all joints of the upper extremity that we cover in class. It benefits you to speak with me early about if you will be traveling with a team, or if a family emergency has come up. There are no provisions for early or make-up examinations if you do not communicate clearly in advance.

VI. DIFFERENTIAL DIAGNOSIS INJURY ASSESSMENT OUTLINES (IAO):

These outlines require you to demonstrate the *differential diagnosis* process for the most commonly-occurring orthopedic pathologies to various body regions. The IAOs will refine your ability to determine (i.e. "rule in") an injury from which a patient is suffering while excluding (i.e. "ruling out") conditions that the examination findings do not support. You will be provided with the most commonly occurring pathologies to the region or joint in order to complete the IAO.

1. Utilizing an outline format, outline the History, Inspection, Palpation, and Special Tests (including Functional, Ligamentous, and Neurological tests) used to assess the common pathologies in the following regions:
   - Face/Eye
   - Head/Neck (C spine)
   - Lumbar Spine (We will interact in class to produce this differential dx algorithm)
   - Shoulder

2. Outlines are due at the completion of each of the anatomically specific units.
   - The History and Special Tests sections are critical to this assignment:
     - For the *History* section, list specific questions you would ask related to the pathology and provide the relevant patient response (i.e., When you ask a patient to recall a list of familiar words, what specific symptom or pathology are you evaluating? i.e. Cognitive processing after MTBI)
     - For *Special Tests* section: *provide the specific pathology* ruled-out with each test (e.g., When you perform the Halo test, what specific pathology are you attempting to rule out (Cranial Fx)? Straight Leg Raise (Sciatica/HNP)?
   - Utilize and reference at least two sources in addition to your textbook.

VII. EXECUTIVE SUMMARY OF CURRENT LITERATURE: *Signature Assignment – Written Rubric*

Requirements:

A formal paper is required based upon a review and critical analysis of the current literature on one of the topics from class (see list below for ideas). While a traditional research paper requires extensive analysis and writing, an **executive summary** summarizes or reviews the best current evidence on a current topic for an audience that is strapped for time and wants the consensus opinion on that topic. An effective executive summary **analyzes and summarizes** the most important points of the topic, and will often make a **recommendation** based on the analysis. I will provide an example of an Executive Summary in class.

Expectations are high for this paper; the finished product should be of such quality as to be eligible for submission to a graduate student-writing contest (such as the NATA, APTA, or other foundation). You may select one of the topics below on which to write your executive summary, although your title does not have to match these exactly. Be innovative, but please have your professor review your working title if it deviates significantly from those below. I will have you turn in your Abstract, Introduction and Sources on a separate occasion before the final paper.

1. Evidence Based Treatment of the Cervical Spine: pathomechanics of injury and management strategies
2. Determining the most effective classification system (i.e. Clinical Prediction Rule) for lumbar spine pathology.
3. Evidence based diagnosis, treatment and return to play guidelines for Mild Traumatic Brain Injury.
4. Differential Diagnosis of Glenohumeral Impingement Syndromes
5. Differential Diagnosis of the Types of Glenohumeral Instability
6. Surgical and Rehabilitation Options for Treating Anterior Glenohumeral Instability".
7. OTHER: You may request approval of another topic of interest by Dr. Sullivan.

Format (A rubric will be provided to guide your writing):

- AMA Style (Consult American Medical Association *Manual of Style.*)
- Minimum length: at least 5 pages, double-spaced
- Title page-see Appendix C
- Include Abstract on a separate leaf following title page-see example on Canvas

Abstracts and references will be submitted prior to 1st draft

- References page-see example on Canvas
- At least 5 high quality, peer-reviewed references at minimum.
- References must be from peer-reviewed medical and/or allied health journals (i.e., Am J Sports Med, JAMA, Arch. Phys. Med. Rehab, JAT, Sport Health, JSR, JOSPT, PT, etc).
- All references must be published within the past 10 years.

INCOMPLETES AND LATE ASSIGNMENTS

All assignments are to be submitted/turned in by the beginning of the class session when they are due—including assignments posted in Canvas. Incompletes will only be assigned in extremely unusual circumstances.

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.

GRADING

A total of 1000 points is possible in this class as follows:

Assignment	Point Possible	Your Points
Clinical Examination Video Tutorial 1@40 pts	40	
Participation: Discussion Board: 3 posts @10 pts each	30	
Quizzes 4@10 pts each	40	
Public Service Announcement: MTBI	100	
Lab Practicals 4@60 pts each	240	
Written Exams 3@100 pts each	300	
Differential Diagnosis: Inj Assess Outlines 4@20 pts	80	
Review of Lit. Paper 2@75 each	50	
Final Exam	120	

COURSE SCHEDULE

*(*assignment and topic dates may change. Visit here for latest schedule.)*

Date	Topic	Reading: *Starkey text*	Assignment Due	Activity
1/8	Intro to Orthopedic Examination & the Differential Diagnosis Process	Review Ch 1 & 3	Review syllabus, course schedule, Canvas	Syllabus Partner Teaching
1/10	Pathologies of the Eye and Face	Ch 19, 20	*Due: Quiz 1: EBP in the Dx Process*	
1/15	**ADD CONTENT (previously off for MLK)**	Ch 19, 20	*Due Quiz 2: Eye Pathologies*	
1/17	Eye/Face Discussion & Lab		*View Face Mini-Lecture* *Due: IAO: Face* *Complete Quiz 3: Face* by Friday	Lab directed *Send-A-Problem*
1/22	Differential Dx of Thoracic, Abdominal and Cardiopulmonary Pathologies	Review Ch 15 Review Abdomen NATA Doc	Read: Commotio Cordis Complete Super Quiz: Face-EENT-Thorax by Friday	Find your neighbor *(Ab/Thorax pathologies using NATA doc)*
1/24	Spine Pathologies: Thoracic and Lumbar Spine	Ch13		
1/29	T & L Spine Neurology	Ch 13 "But My MRI says…"	Due: Clinical Exam Tutorial - L Spine & SI Joint Teams Discussion Board Due: Read and react: 1. ***Classification System for Low Back Pain (LBP)*** 2. **Clinical Prediction Rule for LBP Using Manipulation** 3. **Subgrouping Patients with LBP: a classification approach to Therapy**	Share DB post in class discussion
1/31	Wrap up T & L Spine Neuro ~~Sacroiliac Joint~~/Diff Dx of LBP		IAO: L Spine (will complete in class) Discuss Executive Summary	Build IAO together
2/5	***LAB:*** Clinical Exam of the Spine		DB posts: L Spine and SI Joint Tutorials	
2/7	*Lumbar Spine and SI Joint Case Studies (*Lab practical review)	Review 13		L Spine Case Studies in Lab
2/12	*SI Joint*		**Exam 1 (online)**	
2/14	**Lab Practical 1** **Sign Up**	Ch 14 Readings for MTBI (on canvas)	Clinical Exam Tutorial: Cervical Spine Team	
2/19	Differential Dx of the Cervical Spine	Ch14	Clinical Exam Tutorial: MTBI Team View *Brachial Plexus for Students* iBook	
2/21	Differential Dx of C Spine and Head	Ch14, 21 Blood Test to Dx mTBI	Read NATA Position Statement: Sport Related Concussion Due: Discussion posts: Cervical spine	

2/26	Mild Traumatic Brain Injury	Ch16	Kinesiology Lib Guide	"Shareout" of NATA Position Statement Use this Googledoc
2/28	**LAB**: MTBI & C Spine	Ch16	Due: Discussion Posts: MTBI/TBI	
	SPRING BREAK (3/4-3/8)		*Abstract/Intro/Refs for Executive Summary*	
3/12	Shoulder Differential Dx	Ch 16	Clinical Exam Tutorial: Shoulder & Scap	
3/14	Shoulder	Ch 16	Clinical Exam Tutorial: Shoulder Instability Concussion Movie DB (for extra credit) Due Friday	
3/19	**LAB:** Clinical Exam of Shoulder and Upper Arm	Ch 17	DB posts: Shoulder & Scapula IAO: Head & Cervical Spine	
3/21	**LAB:** Shoulder Case Studies, Differential Dx			*Send-A-Problem & Find your partner*
3/26	Lab practice: Shoulder Case studies and C Spine/Head review	Ch 17	Lab Practical Sign Up	
3/28	*Lab Practical #2*: Shldr/C spine/Head			
4/2	NO CLASS		Clinical Exam Tutorial: Elbow & Wrist Executive Summary Due	
4/4	Elbow and Forearm Diff Dx		**Exam #2:** Head/Neck/Shoulder *(online? Tuesday*)	
4/09	Elbow & Forearm Diff Dx		DB posts: Elbow & Wrist	
4/11	**Lab:** Elbow Forearm	Ch 18		
4/16	Wrist & Hand Diff Dx	Ch 18		
4/18	**EASTER BREAK** (shift classes up?) Wrist & Hand Diff Dx (lab if time)	Ch 18		
4/23	**Lab: Elbow, Wrist, Hand**	Ch 18	Elbow, Wrist, Hand Online (Takehome) Exam: Due Friday by midnight	
4/25	Review			

FINAL EXAM: Tuesday 1:30-4pm
Final Essay Q's are online, due April 29th.

No	Competency
PHP-4	Explain how the effectiveness of a prevention strategy can be assessed using clinical outcomes, surveillance, or evaluation data.
PHP-17c	Traumatic brain injury
PHP-17h	Cervical spine injury
CE-4	Describe the principles and concepts of body movement, including normal osteokinematics and arthrokinematics.
CE-6	Describe the basic principles of diagnostic imaging and testing and their role in the diagnostic process.
CE-10	Explain diagnostic accuracy concepts including reliability, sensitivity, specificity, likelihood ratios, prediction values, and pre-test and post-test probabilities in the selection and interpretation of physical examination and diagnostic procedures.
CE-12	Apply clinical prediction rules (eg, Ottawa Ankle Rules) during clinical examination procedures.
CE-13	Obtain a thorough medical history that includes the pertinent past medical history, underlying systemic disease, use of medications, the patient's perceived pain, and the history and course of the present condition.
CE-14	Differentiate between an initial injury evaluation and follow-up/reassessment as a means to evaluate the efficacy of the patient's treatment/rehabilitation program, and make modifications to the patient's program as needed.
CE-17	Use clinical reasoning skills to formulate an appropriate clinical diagnosis for common illness/disease and orthopedic injuries/conditions.
CE-18	Incorporate the concept of differential diagnosis into the examination process.
CE-20a	history taking
CE-20b	inspection/observation
CE-20c	palpation
CE-20d	functional assessment
CE-20e	selective tissue testing techniques / special tests
CE-20f	neurological assessments (sensory, motor, reflexes, balance, cognitive function)
CE-21b	Palpation
CE-	Muscle function assessment

No	Competency
21c	
CE-21h	Neurologic function (sensory, motor, reflexes, balance, cognition)
CE-21m	Ocular function (vision, ophthalmoscope)
CE-21n	Function of the ear, nose, and throat (including otoscopic evaluation)
CE-22	Determine when the findings of an examination warrant referral of the patient.
AC-34	Explain the importance of monitoring a patient following a head injury, including the role of obtaining clearance from a physician before further patient participation.
AC-36b	brain injury including concussion, subdural and epidural hematomas, second impact syndrome and skull fracture
AC-36c	cervical, thoracic, and lumbar spine trauma
AC-36g	internal hemorrhage
PD-9	Specify when referral of a client/patient to another healthcare provider is warranted and formulate and implement strategies to facilitate that referral.
CIP-4a	upper extremity
CIP-4c	head
CIP-4d	neck
CIP-4e	thorax
CIP-4f	spine

Executive Summary Paper
Entitled:

XXXXXXXXX XXXXX XXXXX
XXXXX
XXXXX XXXX XXXXX

By
Your Name

Submitted as
partial fulfillment of the requirements for
ATR 388
Assessment of Head, Spine, and Upper Extremity Pathology

Point Loma Nazarene University
November, 2019

Athletic Training Competencies