



ATR 6005
**Research Methods and Statistical Techniques for
Clinical Decisions in Sports Medicine**

Department of Kinesiology
Number of Units: 3
Spring 2024

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| Meeting days: Tuesday | Instructor: Arnel Aguinaldo, PhD, ATC ("Dr. A") |
| Meeting times: 10:30AM - 12:15PM | Phone: 619-849-3007 |
| Meeting location: BAL 152 + Zoom | Email: aaguinal@pointloma.edu |
| Final Exam: Mar 3, 2024 (Take-Home) | Office Hours (Virtual or F2F) |

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 will explore the variety in research design and statistics commonly used in clinical research, further developing student analytical skills needed to support professional evidence-based practice in athletic training. Students will evaluate the merit and relevance of published research to the practice of athletic training from the perspective of experimental methodology and design. This course also provides an overview of statistics including descriptive and inferential statistics. Students should have a basic understanding of conducting library and Internet information searches prior to taking this course. Students will select a topic of interest related to athletic training, conduct a review of the literature, define a research question, and prepare and present a report to their peers. Students will complete human participants protection training.

COURSE AIM

This course will provide you with basic knowledge of literature review, descriptive and inferential statistics, diagnostic test accuracy, and research proposal prior to enrolling in ATR 6010A (Evidence-Based Practice and Concepts in Sports Medicine).

INSTITUTIONAL LEARNING OUTCOMES (ILO)

1. **Learning, Informed by our Faith in Christ**
Students will acquire knowledge of human cultures and the physical and natural world while developing skills and habits of the mind that foster lifelong learning.
2. **Growing, In a Christ-Centered Faith Community**
Students will develop a deeper and more informed understanding of others as they negotiate complex professional, environmental and social contexts.
3. **Serving, In a Context of Christian Faith**
Students will serve locally and/or globally in vocational and social settings.

PROGRAM LEARNING OUTCOMES (PLO)

The Point Loma Nazarene University MS-AT graduate will be able to:

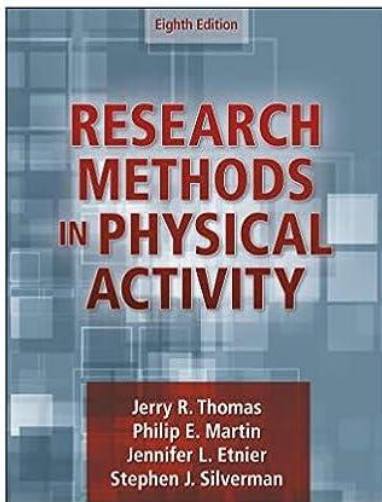
1. Prepare students to demonstrate competency in interpreting evidence-based research and improving clinical standards and practice through clinical question development and research methodology
2. Prepare students to develop expertise in the athletic training domains through an integrative experiential clinical model
3. Equip students with appropriate knowledge and educational foundation required for an entry-level Certified Athletic Trainer (ATC)
4. Prepare students to establish and understand the importance of inter-professional relationships, while collaborating with other health care professionals to become effective communicators
5. 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 (CLO)

Upon completion of this course, students should be able to:

1. Explain the value and importance of developing research ideas, conducting research and employing the scientific method within the field of athletic training to solve relevant problems.
2. Explain the general principles of research design for experimental and non-experimental research, including literature review, sampling procedures, selection of subjects, ethical treatment of subjects, data collection, and IRB standards.
3. Understand basic measurement constructs such as validity, reliability, scales of measurement, field tests, and laboratory tests
4. Employ statistical analysis for the purpose of exploratory data analysis and hypothesis testing, including t-tests and simple ANOVAs, and estimating effect sizes
5. Identify measures of risk factors of injury such as absolute risk, relative risk, and odds ratio
6. Estimate the accuracy of diagnostic tests using specificity, sensitivity, likelihood ratio, and prediction values
7. Develop and present a research project proposal for a Critically Appraised Topic (CAT) or clinical study

REQUIRED RESOURCES



Thomas, J.R., Martin, P., Eitner, J.L., & Silverman. S. (2022). **Research Methods in Physical Activity** (8th ed.). Champaign, IL: Human Kinetics. [Purchase eBook here.](#)

- **zoom** Zoom video conferencing will be used for synced meetings and virtual office hours

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. All supplemental materials posted on this course site (including articles, book excerpts, or other documents) are provided for your personal academic use. These materials may be protected by copyright law and should not be duplicated or distributed without permission of the copyright owner.

ASSESSMENT AND GRADING

Course Requirements: Assessment of Course Learning Outcomes

1. **Participation (10%):** *Assesses Course Learning Outcomes #1, #2, #4, #6*
We have supplemented the course text and lecture materials with current evidence-based medical literature. It is expected that course material will be read beforehand so that informed and lively discussion may be the primary focus of live class meetings and online discussions. After certain readings, you will respond to questions or prompts on the Live Webinar Agenda or Discussion Board on Canvas the Thursday of the module in which the discussion is assigned followed by at least two replies to your peers by Sunday. At other times, you will be asked to summarize the key points of outside readings by outlining the major points of the article prior to class. Additionally, you are expected to participate in

the Meet & Greet discussion in Week 1 (worth 5 points).

2. ***Syllabus and In-video quizzes (10%): Assesses Course Learning Outcomes #2-4***

The first quiz of the course is a simple syllabus quiz. In order to assess your preparation in course modules, you will complete in-video quizzes using Canvas Studio to gauge your preparation for discussions. These will also allow the professor to ascertain “sticking points” for students so that class time can be spent in clarifying key concepts.

3. ***Protecting Human Research Participants Certification (2%): Assesses Course Learning Outcome #2***

All investigators engaging in clinical research where human participants are involved must undergo human subjects training. This training covers the ethical issues involving human participants in research. You will need to submit your certificate of completion by week 3, which is worth 10 points. You cannot participate in any of the course's assignments involving data collection and analysis (described in IV-VI below) without this certificate.

4. ***Assignments (20%): Assesses Course Learning Outcomes #3, #4, #5, #6***

There are several assignments all designed to enhance your understanding and application of research methods and/or statistical concepts. All write ups need to be completed in APA format and submitted via Canvas before class on the due date (see course schedule).

5. ***Proposal presentation (20%): Assesses Course Learning Outcome #5***

During the last week of classes, you will be expected to present your thesis/capstone project topic in a formal proposal environment. This session is open to all faculty and your classmates. Your grade for this presentation will be based on the quality of your presentation and mastery of the material, your ability to respond to content questions from the audience, and your overall professionalism.

6. ***Proposal documents (20%): Assesses Course Learning Outcome #7***

The culmination of your semester's work will be a completed proposal document to be submitted via Canvas. This document will be graded based on quality of content, the degree to which you have addressed all the major aspects of your thesis/project topic, and your ability to meet department guidelines for completed thesis/capstone project. Your proposal document should include the following items and will be due in parts at various dates throughout the semester:

- Research Question(s): You will identify your question of interest for the Proposal Project.

- Introduction and Literature Review
 - Proposed Methods and Data Analysis
7. **Final Exam (20%):** *Assesses Course Learning Outcomes #1-4, #6*

The final exam will be given at the end of the quad and will be summative over the course content covered in class. This exam will be distributed via Canvas one week before the scheduled exam date to allow you adequate time to review the material and prepare your answers. You are free to work in groups or ask for help from the instructor. **However, the final written answers should be in your own words!**

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 [Traditional Undergraduate Records: Final Exam Schedules](#) site. If you find yourself scheduled for three (3) or more final examinations on the same day, you are authorized to contact each professor to arrange a different time for one of those exams. However, unless you have three (3) or more exams on the same day, no requests for alternative final examinations will be granted.

INCOMPLETE AND LATE ASSIGNMENTS

All assignments are to be submitted via Canvas by the due date and time listed in the calendar.

Late work (turned in any time after the due date and time) may be turned in until the last day of class, for a maximum of 50% credit (this is still a failing grade but is better than zero points).

Missed exams may ONLY be made up with a legal, written excuse. A missed exam for an approved reason MUST be completed prior to the subsequent module.

CREDIT HOUR INFORMATION

In the interest of providing sufficient time to accomplish the stated Course Learning Outcomes, this class meets the PLNU credit hour policy for a 3 unit class delivered over 15 weeks. Specific details about how the class meets the credit hour requirement can be provided upon request. (Based on 37.5 hours of student engagement per credit hour.)

| Category | Time Expectation in Hours |
|----------|---------------------------|
|----------|---------------------------|

| | |
|---|------------|
| Online Participation in Discussions, Groups, etc. | 20 |
| Reading Assignments | 25 |
| Written Assignments | 20 |
| Other Assignments & Learning Activities | 24 |
| Quizzes, Surveys | 24 |
| Total Hours | 113 |

| Course Assignments | % |
|--|----------|
| Discussion Board | 10 |
| Online Quizzes | 8 |
| Human Subjects Protection Certification | 2 |
| Assignments | 20 |

| | |
|------------------------------|----|
| Proposal Presentation | 20 |
| Proposal Documents | 20 |
| Final Exam Assignment | 20 |
| Total: 100 | |

Grading Schema

| Grade | Max | Min |
|--------------|------------|------------|
| A | 100 % | to 94.0% |
| A- | < 94.0 % | to 90.0% |
| B+ | < 90.0 % | to 87.0% |
| B | < 87.0 % | to 84.0% |
| B- | < 84.0 % | to 80.0% |
| C+ | < 80.0 % | to 77.0% |

| | | |
|----|----------|----------|
| C | < 77.0 % | to 74.0% |
| C- | < 74.0 % | to 70.0% |
| D+ | < 70.0 % | to 67.0% |
| D | < 67.0 % | to 64.0% |
| D- | < 64.0 % | to 61.0% |
| F | < 61.0 % | to 0.0% |

NOTE: It is your responsibility to maintain your class schedule. Should the need arise to drop this course (personal emergencies, poor performance, etc.), you have the responsibility to first contact the professor. Then if no accommodations can be made, you are responsible to follow through (provided the drop date meets the stated calendar deadline established by the university).

STATE AUTHORIZATION

State authorization is a formal determination by a state that Point Loma Nazarene University is approved to conduct activities regulated by that state. In certain states outside California, Point Loma Nazarene University is not authorized to enroll online (distance education) students. If a student moves to another state after admission to the program and/or enrollment in an online course, continuation within the program and/or course will depend on whether Point Loma Nazarene University is authorized to offer distance education courses in that state. It is the student's responsibility to notify the institution of any change in his or her physical location. Refer to the map on [State Authorization](#) to view which states allow online (distance education) outside of California.

CONTENT WARNING

I acknowledge that each of you comes to PLNU with your own unique life experiences. This contributes to the way you perceive various types of information. In Research Methods, all of the class content, including that which may be intellectually or emotionally challenging, has

been intentionally curated to achieve the learning goals for this course. The decision to include such material is not taken lightly. These topics include diagnostic testing, epidemiology, and injury etiology. If you encounter a topic that is intellectually challenging for you, it can manifest in feelings of discomfort and upset. In response, I encourage you to come talk to me or your friends or family about it. Class topics are discussed for the sole purpose of expanding your intellectual engagement in the area of sports medicine, and I will support you throughout your learning in this course.

TRIGGER WARNING

I acknowledge that each of you comes to PLNU with your own unique life experiences. This contributes to the way you perceive several types of information. In Research Methods, we will cover a variety of topics, some of which you may find triggering. These topics include diagnostic testing, epidemiology, and injury etiology. Each time this topic appears in a reading or unit, it is marked on the syllabus. The experience of being triggered versus intellectually challenged are different. The main difference is that an individual must have experienced trauma to experience being triggered, whereas an intellectual challenge has nothing to do with trauma. If you are a trauma survivor and encounter a topic in this class that is triggering for you, you may feel overwhelmed or panicked and find it difficult to concentrate. In response, I encourage you to take the necessary steps for your emotional safety. This may include leaving class while the topic is discussed or talking to a therapist at the Counseling Center. Should you choose to sit out on discussion of a certain topic, know that you are still responsible for the material; but we can discuss if there are other methods for accessing that material, and for assessing your learning on that material. Class topics are discussed for the sole purpose of expanding your intellectual engagement in the area of sports medicine, and I will support you throughout your learning in this course.

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.

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.

ARTIFICIAL INTELLIGENCE (AI) POLICY

You are allowed to use Artificial Intelligence (AI) tools (e.g, ChatGPT, iA Writer, Marmot, Botowski) to generate ideas, but you are not allowed to use AI tools to generate content (text, video, audio, images) that will end up in any work submitted to be graded for this course. If you have any doubts about using AI, please gain permission from the instructor.

PLNU ACADEMIC ACCOMMODATIONS POLICY

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities. Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center (EAC@pointloma.edu or 619-849-2486). Once a student's eligibility for an accommodation has been determined, the EAC will issue an academic accommodation plan ("AP") to all faculty who teach courses in which the student is enrolled each semester.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their AP in that particular course and/or if they do not wish to utilize some or all of the elements of their AP in that course.

Students who need accommodations for a disability should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. It is the student's responsibility to make the first contact with the EAC.

PLNU ATTENDANCE AND PARTICIPATION POLICY

Hybrid Format

At Point Loma Nazarene University, attendance is required at all scheduled classes. Adult Degree Completion courses are taught in the hybrid format, which means some class meetings will be face-to-face and some will be online.

Attendance in the face-to-face classes is to be for the entire time of the class. Arriving late or leaving early will be considered a partial absence. A day of attendance in an online class is determined as contributing a substantive note, assignment, discussion, or submission that adds

value to the course as determined by the instructor. Three days of attendance are required each week. (It may be any three days during the week.)

Face-to-face Portion of the Hybrid course

In blended or hybrid courses, if a student misses one face-to-face class then the faculty member will send an email to the student and the Director of Student Success warning of attendance jeopardy. There are no exceptions to this policy.

If a student misses two face-to-face classes, the faculty member or Vice Provost for Academic Administration (VPAA) will initiate the student's de-enrollment from the course without further advanced notice to the student. If the date of de-enrollment is past the last date to withdraw from a class, the student will be assigned a grade of "F" and there will be no refund of tuition for that course.

Online Portion of the Hybrid Course

If a student misses two online classes (fails to contribute to a discussion board) during the course, then the faculty member will send an email to the student and the Director of Student Success warning of attendance jeopardy. There are no exceptions to this policy.

If a student misses three online classes (fails to contribute to a discussion board by the due date) during the course, then the faculty member or Vice Provost for Academic Administration (VPAA) will initiate the student's de-enrollment from the course without further advanced notice to the student. If the date of de-enrollment is past the last date to withdraw from a class, the student will be assigned a grade of "F" and there will be no refund of tuition for that course.

1 missed F2F class = warning

2 missed F2F classes = de-enrollment

2 missed online classes = warning

3 missed online classes = de-enrollment

Online Format

Students taking online courses are expected to attend each week of the course. Attendance is defined as participating in an academic activity within the online classroom which includes posting in a graded activity in the course. (Note: Logging into the course does not qualify as participation and will not be counted as meeting the attendance requirement.)

Students who do not attend at least once in any 3 consecutive days will be issued an attendance warning. Students who do not attend at least once in any 7 consecutive days will be dropped from the course retroactive to the last date of recorded attendance.

Asynchronous Attendance/Participation Definition

A day of attendance in asynchronous content is determined as contributing a substantive note, assignment, discussion, or submission by the posted due date. Failure to meet these standards will result in an absence for that day. Instructors will determine how many asynchronous attendance days are required each week.

SPIRITUAL CARE

Please be aware PLNU strives to be a place where you grow as whole persons. To this end, we provide resources for our students to encounter God and grow in their Christian faith. If students have questions, a desire to meet with the chaplain or have prayer requests you can contact the [Office of Spiritual Development](#)

LANGUAGE AND BELONGING

Point Loma Nazarene University faculty are committed to helping create a safe and hospitable learning environment for all students. As Christian scholars we are keenly aware of the power of language and believe in treating others with dignity. As such, it is important that our language be equitable, inclusive, and prejudice free. Inclusive/Bias-free language is the standard outlined by all major academic style guides, including MLA, APA, and Chicago, and it is the expected norm in university-level work. Good writing and speaking do not use unsubstantiated or irrelevant generalizations about personal qualities such as age, disability, economic class, ethnicity, marital status, parentage, political or religious beliefs, race, gender, sex, or sexual orientation. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally, or for other students or student groups. To help accomplish this:

- If you have a name and/or set of pronouns that differ from those that appear in your official PLNU records, please let me know!
- If you feel like your performance in the class is being impacted by your experiences outside of class, please don't hesitate to come and talk with me. I want to be a resource for you.
- I (like many people) am still in the process of learning about diverse perspectives and identities. If something was said in class (by anyone) that made you feel uncomfortable, please talk to me about it.

Inclusive language also avoids using stereotypes or terminology that demeans persons or groups based on age, disability, class, ethnicity, gender, race, language, or national origin. Respectful use of language is particularly important when referring to those outside of the religious and lifestyle commitments of those in the PLNU community. By working toward precision and clarity of language, we mark ourselves as serious and respectful scholars, and we model the Christ-like quality of hospitality.

You may also report an incident(s) using the [Bias Incident Reporting Form](#).

SEXUAL MISCONDUCT AND DISCRIMINATION

In support of a safe learning environment, if you (or someone you know) have experienced any form of sexual discrimination or misconduct, including sexual assault, dating or domestic violence, or stalking, know that accommodations and resources are available through the Title IX Office at pointloma.edu/Title-IX. Please be aware that under Title IX of the Education Amendments of 1972, faculty and staff are required to disclose information about such misconduct to the Title IX Office.

If you wish to speak to a confidential employee who does not have this reporting responsibility, you can contact Counseling Services at counselingservices@pointloma.edu or find a list of campus pastors at pointloma.edu/title-ix.

USE OF TECHNOLOGY

In order to be successful in the online or hybrid environment, you'll need to meet the minimum technology and system requirements; please refer to the [Technology and System Requirements](#) information. Additionally, students are required to have headphone speakers, microphone, or webcams compatible with their computer available to use. Please note that any course with online proctored exams requires a computer with a camera (tablets are not compatible) to complete exams online.

Problems with technology do not relieve you of the responsibility of participating, turning in your assignments, or completing your class work.

LOMA WRITING CENTER

The Loma Writing Center exists to help all members of the PLNU community cultivate transferable writing skills to engage their academic, professional, personal, and spiritual communities. We work toward this goal by conducting one-on-one consultation sessions, supporting writing education across the PLNU community, and participating in ongoing writing center research.

Getting feedback from the Loma Writing Center while you're in the process of working on an assignment is a great way to improve the quality of your writing and develop as a writer. You are encouraged to talk with a trained writing consultant about getting started on an assignment, organizing your ideas, finding and citing sources, revising, editing for grammar and polishing final drafts, and more. For information about how to make in-person or online appointments, see Loma Writing Center webpage or visit the Loma Writer Center on the first floor of the Ryan Library, room 221.

ASSIGNMENTS AT-A-GLANCE