ATR 5005

Research Methods and Statistical Techniques for Clinical Decisions in Sports Medicine

COURSE GENERAL INFORMATION

Dates: 1/14/2020 - 3/6/2020
Credit Hours: 3

DESCRIPTION and OUTCOMES

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 becomes an expression of faith. Being of Wesleyan heritage, we aspire 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 and one-way ANOVA. 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

COURSE INSTRUCTOR

Arnel Aguinaldo, Ph.D., ATC
Email: aaguinal@pointloma.edu (Links to an external site.)
Office Hours: Thursdays 3-5pm or by appointment (Rohr Science 194)

REQUIRED RESOURCES

Thomas, J.R., Nelson, J.K., & Silverman. S. (2015). ***Research methods in physical activity*** (7th ed.). Champaign, IL: Human Kinetics. Purchase eBook here (Links to an external site.).

ADDITIONAL RESOURCES PROVIDED:

- Lecture notes, videos, and journal articles available via the course in Canvas

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ASSESSMENT AND GRADING

Course Requirements: Assessment of Course Learning Outcomes

I. ***Discussion Board 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. These readings will be provided via electronic access to journal articles and systematic reviews. It is expected that course material will be read **before** the scheduled lecture so that informed and lively discussion may be the primary focus of class meetings. The aim of supplemental readings is to keep you

current with contemporary practice (aka "Journal Club"). After certain readings, and prior to the in-class discussion, you will respond to questions on the Discussion Board on Canvas. 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. You should be ready to discuss these outlines with your colleagues in class. Additionally, you are expected to participate in the People Introductions discussion in Week 1 (worth 5 points).

II. ***Inter-Module quizzes (8%):*** *Assesses Course Learning Outcomes #2-4*
You will complete a set of readings in preparation for each week's session. In order to assess your preparation, you will complete an online quiz over the readings as well as the previous week's material to gauge your preparation for in-class discussion. These are not meant to be arduous but to ensure you have appropriately reviewed the material prior to coming to class. These will also allow the professor to ascertain "sticking points" for students so that class time can be spent in clarifying key concepts. There will be **four** module quizzes over the course of the semester. In some cases, you will not be able to "complete" a module without completing the quiz.

III. ***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.

IV. ***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).

V. ***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.

VI. ***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

VII. **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!**

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 a 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

Distribution of Contact Hours

Course Assignments	Pre-Class Hours	Class Hours	Post-Class Hours
Class Sessions		20	
Online Participation in forums, groups, etc.	10		10
Reading	10	5	10
Writing		5	10
Other Assignments & Learning Activities	10	5	10
Exams & Quizzes	4	4	0
Total Course Hours: 113	34	39	40

Grading Points

Course Assignments	Points

Discussion Board	50
Online Quizzes	40
Human Subjects Protection Certification	10
Assignments	100
Proposal Presentation	100
Proposal Documents	100
Final Exam Assignment	100
	Total Course Points: 500

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).*

Grade Scale

A	461-500	B-	396-410	D+	331-345
A-	446-460	C+	381-395	D	311-330
B+	431-445	C	361-380	D-	296-310
B	411-430	C-	346-360	F	0-295

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ACADEMIC HONESTY

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. As stated in the university catalog, "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. Such acts include plagiarism, copying of class assignments, and copying or other fraudulent behavior on examinations. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for a) that particular assignment or examination, and/or b) the course." *See Academic PoliciesLinks to an external site. for full text*.

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 PoliciesLinks to an external site.](#) for full text*. Since this is a blended course of face-to-face and online class meetings, participation in the online modules will be counted as part of the week's attendance record above and beyond the face-to-face time. Participation in an online module may be done by completing a quiz, participating in the Discussion in Canvas, or submitting a completed assignment. Missing two online days during the course will constitute 10% of the course being missed; missing three online days will constitute 20% of the course being missed. Face-to-face time will be determined by actual hours.

ACADEMIC STANDING

Graduate students at Point Loma must obtain a 3.0 GPA to remain in good standing in the MS Kinesiology program:
[http://catalog.pointloma.edu/content.php?catoid=20&navoid=1403#Academic_Standing Links to an external site..](http://catalog.pointloma.edu/content.php?catoid=20&navoid=1403#Academic_Standing)

Additionally, all graduate students need to earn a C or higher in all graduate courses according to the catalog grading policy:

ACADEMIC ACCOMMODATIONS

While all students are expected to meet the minimum standards for completion of this course as established by the instructor, students with disabilities may require academic accommodations or adjustments, modifications or auxiliary aids/services. At Point Loma Nazarene University (PLNU), these students are requested to register with the Disability Resource Center (DRC), located in Rm. 312C at the Mission Valley Regional Center via [DRC@pointloma.edu (Links to an external site.)](mailto:DRC@pointloma.edu) or 619.849.2533. The DRC's policies and procedures for assisting such students in the development of an appropriate Accommodation Plan (AP) allows PLNU to comply with Section 504/508 of the Rehabilitation Act and the Americans with Disabilities Act. Section 504 (a) prohibits discrimination against students with special needs and guarantees all qualified students equal access to and benefits of PLNU programs and activities. After the student files the required and official disability documentation, the DRC will contact the student within 15 business days to schedule an AP meeting. During the AP meeting an Accommodation Plan will be established to meet the student's specific disability-related needs. The DRC will thereafter email the student's AP to all faculty who teach courses in which the student is enrolled each quad/semester. The AP must be implemented in all such courses by faculty. All questions should be directed to the DRC for clarification.

SPIRITUAL CARE

PLNU strives to be a place where you grow as whole persons. To this end we provide resources for our graduate students to encounter God and grow in their Christian faith.

At the Liberty Station campus we have an onsite chaplain, Rev. Wil Ryland who is available during class break times across the week. If you have questions, desire to meet with Rev Ryland or prayer requests you can contact him directly at gradchaplainlibertystation@pointloma.edu (Links to an external site.). In addition, there are resources for your Christian faith journey available on the Graduate Student LifeLinks to an external site. webpage.

FINAL EXAMINATION POLICY

Successful completion of this class requires submitting the completed final examination **on its scheduled day**.

INFORMATION LITERACY

The curriculum of the MS-KIN is designed so that you develop skills in scientific writing, performing statistical analysis of data, reading and critically appraising primary literature, and incorporating current best evidence into your professional practice. Not all information is equally sound or applicable to your practice. Various assignments within this course are designed to accomplish the goal of informational literacy—to evaluate the validity and importance of information obtained from any source and use the information appropriately to solve relevant problems. These assignments include: SPSS Output Reports, in-class article discussions, in-class discussion of experimental design, review of the literature related to your proposal, presentation of proposal. We will regularly direct you to the Ryan Library to accomplish these assignments

USE OF TECHNOLOGY

In order to be successful in the online environment, you'll need to meet the minimum technology and system requirements; please refer to the *Technology and System Requirements* page.

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

If you do need technical help, you may click on the HELP button (located on the top-right corner of Canvas) and choose from whom you want assistance, or you may contact the campus helpdesk (619-849-2222).