Department of Kinesiology	
KIN 6015 - Biomechanical and Neurological Basis of Human Movement	
Number of Units: 3	
Spring 2021	

Meeting days: Asynchronous + Synced Meetings	**Instructor: Arnel Aguinaldo, PhD, ATC ("Dr. A")**
Meeting times: Asynchronous + Synced Meetings	**Phone:** 619-849-3007
Meeting location: Online + RS 195 (labs only)	**Email: aaguinal@pointloma.edu**
Final Exam: Final Exam March 7	**Virtual Office Hours**

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 class focuses on various kinematic, kinetic, and neuromuscular concepts and how they are used in the qualitative and quantitative analysis of human movement. This course is designed for advanced study in 3D motion analysis and electromyography techniques. The intent of this course is to provide students with an extensive knowledge concerning quantitative analysis of human motion and the concepts and equipment to collect objective quantifiable data to be used for clinical or research purposes.

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-KIN graduate will be able to:

1. Appraise current research data in Kinesiology and integrate it into professional practice to solve relevant problems and make effective decisions.
2. Work independently and with a team to persuasively communicate essential information in their discipline.
3. Demonstrate appropriate breadth of knowledge of the background and principle research in their specialization in order to conduct an independent research project.
4. Serve various populations, integrating compassionate care and the Christian faith with their professional practice.
5. Pursue an active and growing involvement in their discipline by achieving advanced certification and/or membership in a related professional organization.

COURSE LEARNING OUTCOMES (CLO)

1. You will apply the basic principles of kinematics in quantifying and describing joint movement.
2. You will identify the concepts of linear and angular kinetics and their effects on human movement.
3. You will demonstrate knowledge of basic neuromuscular mechanisms relevant to joint motion and ways to evaluate them through electromyographic (EMG) methods.
4. You will implement proper techniques involved in the set-up, data collection, data analysis, and interpretation of 3D motion analysis.
5. You will implement proper techniques involved in the set-up, data collection, data analysis, and interpretation of surface electromyography (EMG).
6. You will communicate effectively through written and oral formats the quantitative analysis of selected movement tasks through biomechanical and EMG analysis.
7. You will demonstrate a comprehensive understanding of human movement through kinematic, kinetic, and EMG analysis.

CREDIT HOUR INFORMATION

It is anticipated that students will spend a minimum of 50 participation hours per credit hour on their course work. As a graduate course, students can expect the work in this class to be significant, and students should plan on spending 18-22 hours a week engaged in the course. The estimated time expectations for this course are shown below:

Assignments	Pre-Course Hours	Course Hours	Post-Course Hours
Online Participation in discussions, groups, etc.	--	50	--
Writing	--	50	--
Other assignments and learning activities	1	40	1
Exams and Quizzes	--	8	--
Total Course Hours		150	

COURSE ASSIGNMENTS

In-Video Quizzes (Bulbs): There will be multiple in-video quizzes using PlayPosit worth 5 points each to be scheduled throughout the quad. These quizzes will vary in difficulty depending on the readings covered in class but they gauge your knowledge of the material to be discussed in class (40 pts total).

Mid-Term Exam: A mid-term exam will be administered via Canvas in Week 5 and will consist of multiple choice, T/F, and essay type questions, covering the fundamentals of linear and angular biomechanics of motion as well as muscle mechanics. (40 pts total)

Final Exam: A "take-home" comprehensive exam will be administered on the scheduled final exam date consisting of multiple-choice, T/F, and essay type questions, addressing material covered over the entire course. The exam will be available the week before it is due. (80 pts total)

Lab Reports: There will be 6 labs total throughout the course. These sessions will give you hands-on experience in using state-of-the-art motion analysis, force plate, and surface EMG systems. Your performance in each lab will be assessed with a one-page report to be submitted the week after the lab, worth 10 points each. (60 pts total)

Team Pilots: You will be assigned to a team of 4-5 students, with whom you will collaborate on discussions and a research pilot throughout the course. The pilot will involve collecting data with the systems in the Biomechanics Lab (one team is physically allowed in the lab at a time at designated times) as well as data analysis, interpretation, and write-up. Topics may include, but not limited to, gait analysis, throwing, footwear testing, and kicking. This pilot is a great opportunity to test out the methods to be implemented for your thesis or capstone project. Each team will be required to submit a written manuscript and present a brief talk on your pilot.

Included as part of this grade are the three discussion boards (weeks 2, 4, 6) which three points are awarded according to your contributions for a total of nine points. The rest of the point value is comprised of the main Pilot Study work. (80 points)

REQUIRED TEXTS AND RECOMMENDED RESOURCES

- **Course Reader** (<u>**available through Cognella**</u>   ) including selected excerpts from:
  - Enoka, R. (2015). *Neuromechanics of Human Movement.* Fifth Edition. Champaign, IL: Human Kinetics.
  - Lieber, R. (2010). *Skeletal Muscle Structure, Function, and Plasticity*. Baltimore, MD: Williams & Wilkins.
  - Perrotto, A.O. (1994). *Anatomical Guide for the Electromyographer*. Third Edition. Springfield, IL: Charles C Thomas.
  - Perry, J. (1992). *Gait Analysis: Normal and Pathological Function.* Thorofare, NJ: Slack Incorporated.
  - Robertson, et al. (2014). *Research Methods in Biomechanics.* Second Edition. Champaign, IL: Human Kinetics.
- *Cortex* Reference Manual (Motion Analysis Corp., Santa Rosa, CA)
- *Bagnoli EMG System* User's Guide (Delsys, Natick, MA)
- Visual3D Tutorials
- Handouts will be provided throughout the quad via Canvas.

This course also utilizes the following online tools (free of charge for students) to facilitate student engagement and enhance your learning experience:

- **ZOOM**   - Zoom video conferencing will be used for synced meetings and virtual office hours
- **playposit**   - **PlayPosit** will be used for in-video quizzes and interactive video lectures/tutorials

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ASSESSMENT AND GRADING

Grading Points

ASSESSMENT	POINTS	COURSE OBJECTIVES
In-Video Quizzes	40	1,2,3,7
Mid-Term Exam	40	1,2,3,
Final Exam	80	1,2,3,5,7
Lab Reports	60	3,4,5

Pilot	80	1-7
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Total	300	

Grade Scale

POINTS	GRADE	POINTS	GRADE
279-300	A	219-227	C
270-278	A-	210-228	C-
258-269	B+	198-209	D+
249-257	B	189-197	D
240-248	B-	180-188	D-
228-239	C+	0-179	F

Students must complete the required program hours in the major (program) from Point Loma Nazarene University with a minimum grade of "C" in each course and an overall 2.00 grade point average.

LATE ASSIGNMENTS

All assignments are to be submitted/turned in via Canvas by the beginning of the class session when they are due. 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 returning to the next class meeting.

FINAL EXAMINATION POLICY

Successful completion of this class requires taking the final examination **on its scheduled day.** No requests for alternative days will be approved.

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**   . In addition there are resources for your Christian faith journey available at the PLNU website: **Spiritual Life at PLNU**   .

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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. 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 in the Graduate and Professional Studies Catalog for definitions of kinds of academic dishonesty and for further policy information.

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 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 the Bond Academic Center. (**DRC@pointloma.edu**   or 619-849-2486). The DRC's policies and procedures for assisting such students in the development of an appropriate academic adjustment plan (AP) allows PLNU to comply with Section 504 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 documentation, the DRC, in conjunction with the student, will develop an AP to meet that student's specific learning needs. The DRC will thereafter email the student's AP to all faculty who teach courses in which the student is enrolled each semester. The AP must be implemented in all such courses.

If students do not wish to avail themselves of some or all of the elements of their AP in a particular course, it is the responsibility of those students to notify their professor in that course. PLNU highly recommends that DRC students speak with their professors during the first two weeks of each semester about the applicability of their AP in that particular course and/or if they do not desire to take advantage of some or all of the elements of their AP in that course.

ATTENDANCE POLICY

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

ACADEMIC STANDING

Graduate students at Point Loma must obtain a 3.0 GPA to remain in good standing in the MS Kinesiology program. Additionally, all graduate students need to earn a C or higher in all graduate courses according to the catalog grading policy found here: **GPS Academic Standing**

GRADING SYSTEM

Traditional letter grades (A, B, C, D, F) including plus and minus grades are used to indicate the level of scholarship earned for each course. Except for the correction of an error, all traditional letter grades are final at the conclusion of the academic term. Once the degree has been posted on the student's official transcript, no change of grade action is allowed for courses leading to the degree. The grade of C is the lowest grade acceptable for graduate credit.

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.

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).

Point Loma Nazarene University encourages the use of technology for learning, communication, and collaboration. It is the responsibility of the student to confirm access to the essential applications needed for the class such as Excel as well as standard online research tools.

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 graduate students to encounter God and grow in their Christian faith. There are resources for your Christian faith journey available at the **Graduate & Professional Student Spiritual Life web page.**

DIVERSITY AND INCLUSION STATEMENT

It is my intent that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that the students bring to this class be viewed as a resource, strength, and benefit. It is my intent to present materials and activities that are respectful of diversity: disability, age, socioeconomic status, ethnicity, race, nationality, religion, gender, and culture. 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.