**PED370 (3CR); FALL 2019**



Biomechanical Basis of Human Movement

College of Education

Department of Physical Education

Classroom: CTLB110

MWF: 9:00-9:50AM

Motivational Syllabus

Adapted from information presented in Harrington, C, & Thomas, M. (2018). Designing a motivational syllabus: creating a learning path for student engagement. Sterling, VA: Stylus.

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**MANUAL FOR SUCCESS IN THIS COURSE:**

The syllabus provides an opportunity for professors to communicate why the course content matters and the benefit of learning the knowledge and skills described in the course learning outcomes.

By using the syllabus to map out a clear path for learning, and by creating meaning assignments and learning activities designed to achieve learning outcomes, my hope is that my students will see the value of learning tasks implemented in this course.

This syllabus is intended to be used as a communication tool, a planning tool, a supportive tool, and ultimately a motivation tool.

**INSTRUCTOR BIO:**

I have a passion for understanding human movement and using that knowledge to help those who are dealing with motor impairments. Much of my research has focused on postural control in children with Autism Spectrum Disorders. I especially enjoy sharing my passion with my students.

I strive to help my students develop a love of learning by exploring, by doing and by solving and hope to leave them with thirst for seeking knowledge for their own sake and future benefit.

My commitment to you is to see that the course goals and learning objectives are met. I am committed to quality teaching. Class time will be organized, interactive, relevant, and challenging.

I need you to commit to the course as well. I expect you to come to class prepared ensuring that you have read the appropriate readings and have completed the necessary homework. This course has a reputation of being very challenging. However, I will do everything in my power to help each one of my students be successful. I am confident that all my students can be successful.

If there is anything I can do to make this course more relevant to you and your professional goals, please let me know. I encourage you to take advantage of my office hours. I will help you in any way that I can.

Thank you in advance for what I know is going to be a rewarding semester for all involved. I am glad you are a student in my class and I am looking forward to getting to know you better.

**Dr. Fournier (“Four”-”Knee”-”A”)**

**WHY TAKE THIS COURSE?**

Kinesiology is defined as the study of human movement. It is an umbrella term to describe any form of anatomical, physiological, or mechanical evaluation of human movement.

Biomechanics is defined as the study of human movement by means of mechanical principles.

This course will provide you with the knowledge and skills necessary describe, analyze, and evaluate human movement and gain a better understanding of the mechanisms responsible for injured or disordered movement.

In addition to learning theory and solving computational problems, you will gain hands-on experience performing biomechanical analyses in our state-of-the-art Motion Analysis Laboratory that includes a simi motion capture system and a Bertec split-belt, forceplate instrumented treadmill. This class will offer professional skills for physical educators, exercise scientists and those interested in pursuing graduate degrees in the rehabilitation sciences (physical therapy, occupational therapy, athletic training, etc...).

**WHAT BOOK OR OTHER MATERIALS DO I NEED?**

**Textbook**



Course materials will be provided by instructor in UNMLearn. If you are interested in a book for professional reference, please consider:

Hall, S. J. (2012). Basic biomechanics (7th Ed). New

**Calculator**



In this class, we will be describing human movement numerically. In order to calculate biomechanical measures, you will be required to have a calculator with you for every class. Please purchase a scientific calculator (~ $10.00). Graphing functions are not needed.

**UNMLearn**



Many of the materials, instructions, and updates for this class will be posted in our UNMLearn site. It is your responsibility to log in to UNMLearn ROUTINELY and be up to date with all information posted pertaining to the class.

**WHAT WILL I LEARN?**

|  |
| --- |
| **Course Goal 1:** Upon successful completion of the course, students will ***know*** basic terminology related to A) human anatomy and B) mechanical principles. |
| **Learning Objectives** | **Graded Component(s)** |
| Upon completion of the course, students will be able to *identify* and label musculoskeletal components in the upper and lower extremities. | Active learning activitiesExam 3 |
| Upon completion of the course, students will be able to *define* mechanical terminology and principles. | QuizzesExams 1 & 2 |
| Upon completion of the course, students will be able to *quantify* mechanical measures. | ActivitiesExams 1, 2, & 4 |
| Upon completion of the course, students will be able to *apply* mechanical principles by calculating mechanical measures through problem solving. | Problem solvingQuizzesExams 1, 2, & 4 |
| **Course Goal 2: U**pon successful completion of the course, students will better ***understand*** human movement using anatomy and mechanical principles. |
| **Learning Objectives** | **Graded Component(s)** |
| Upon successful completion of the course, students will be able to *explain* various types of movement using their knowledge of anatomy and mechanical theories learned in class. | Baseball Bat Article Family VideoExam 3 |
| Upon successful completion of the course, students will be able to a*nalyze and evaluate* movement based on calculated empirical evidence obtained using kinematic and kinetic methodologies. | Vertical JumpGiant SwingGait LaboratoryExam 4 |
| **Course Goal 3:** Upon successful completion of the course, students will better understand how to generally think and reason with numbers (numeracy). |
| **Learning Objectives** | **Graded Component(s)** |
| Upon successful completion of the course, students will be able to *describe* and illustrate phenomena using numbers. | Analysis of PostureAnalysis of Gait |
| Upon successful completion of the course, students will be able *hypothesize, test, and assess* using numbers. | Analysis of PostureAnalysis of Gait |

**WHEN ARE THINGS DUE?**

Please Note: This is a tentative schedule. Any changes made to the schedule will be announced ahead of time in UNMLearn. I will do my best to adhere to this schedule, but occasionally there are extenuating circumstances that must result in a change.

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** |  | **Lecture Topic** | **Quizzes & Activities** |
| 1/14 | M | Syllabus |  |
| 1/16 | W | Introduction |  |
| 1/18 | F | Algebra & Trigonometry  | Syllabus Quiz in UNMLearn (Quiz 1) |
| 1/21 | M | Martin Luther King Jr. Day - Class does not meet |  |
| 1/23 | W | Algebra & Trigonometry  |  |
| 1/25 | F | Forces & Vectors |  |
| 1/28 | M | Forces & Vectors |  |
| 1/30 | W | Linear Kinematics | Quiz 2 in Class |
| 2/1 | F | Linear Kinematics |  |
| 2/4 | M | Linear Kinetics |  |
| 2/6 | W | Linear Kinetics | Quiz 3 in Class |
| 2/8 | F | Vertical Jump Lab  | Worksheet Due in UNMLearn (2.5 points) |
| 2/11 | M | Review |  |
| 2/13 | W | Exam 1 |  |
| 2/15 | F | Torques |  |
| 2/18 | M | Torques |  |
| 2/20 | W | Angular Kinematics |  |
| 2/22 | F | Angular Kinematics |  |
| 2/25 | M | Angular Kinetics | Quiz 4 in Class |
| 2/27 | W | Angular Kinetics | Article Assignment DUE in UNMLearn (2.5 points) |
| 3/1 | F | Giant Swing Lab | Worksheet DUE in UNMLearn (2.5 points) |
| 3/4 | M | Review |  |
| 3/6 | W | Exam 2 |  |
| 3/8 | F | Anatomical Planes | Active Learning (2 point activity) |
| 3/11-3/15 | M-F | Spring Break - Class Does Not Meet |  |
| 3/18 | M | Joint Actions | Active Learning (2 point activity) |
| 3/20 | W | Muscles to Know  | Active Learning (2 point activity) |
| 3/22 | F | Muscles and joint actions |  |
| 3/25 | M | Musculoskeletal & Neuromuscular Biomechanics | Quiz 5 in UNMLearn |
| 3/27 | W | Musculoskeletal & Neuromuscular Biomechanics |  |
| 3/29 | F | Goniometry | Active Learning (2 point activity) |
| 4/1 | M | Review |  |
| 4/3 | W | Exam 3 |  |
| 4/5 | F | The Family that Walks on All Fours Discussion |  |
| 4/8 | M | The Family that Walks on All Fours Discussion | Gallery Walk Activity in Class (2.5 points) |
| 4/10 | W | Posture Theory & Application |  |
| 4/12 | F | Posture Theory & Application |  |
| 4/15 | M | Gait Theory |  |
| 4/17 | W | Gait Theory | Active Learning (2 point activity) |
| 4/19 | F | Gait Theory & Application |  |
| 4/22 | M | Gait Data Collection | Attendance (2 point activity) |
| 4/24 | W | Gait Data Collection | Attendance (2 point activity) |
| 4/26 | F | Gait-Laboratory |  |
| 4/29 | M | Gait-Laboratory | Quiz 6 in Class |
| 5/1 | W | Gait Laboratory |  |
| 5/3 | F | Review | Laboratory DUE in UNMLearn (10 points) |
| 5/8 | W | Final Exam (Exam 4) | To be held in regular classroom |

**WHAT WILL I NEED TO DO?**

Class Participation: Students are expected to fully participate in all class activities and class discussions. Please bring your slides/notes to class.

Exams (4, 15 points each, no drops): Four exams will be administered throughout the semester. Exams will be announced in class and in UNMLearn. The exams may include questions in any of the following formats: quantitative problem solving, multiple choice, fill in the blank, or short answer. Exam grade inquiries can be made in writing within 1 week of the exam being handed back. The fourth/final exam is NOT cumulative.

Quizzes (6, 2 points each, lowest score dropped)

Six quizzes will be administered throughout the semester. Quizzes will be announced in class and in UNMLearn. Quizzes may be administered in class or in UNMLearn. *Your lowest score will be dropped.*

Quizzes in this class are used as learning tools. I tend to ask questions that not only help me have a better understanding of where my students are in the learning process, but I purposefully design my question to surface common, yet nuanced, misconceptions or misunderstandings.

Activities and Laboratories: Various activities and one formal laboratory will be performed throughout the semester.

* Activities and laboratories will focus the biomechanical analysis of human movement.
* In-class activities are performed during class time and may be held in our regular classroom, the Health/Fitness Lab, in a computer lab, or in the Motion Analysis Lab. There will be 6 in-class activities during the semester. *Your lowest score will be dropped*.
* Out-of-class activities will require work outside of class time and generally requires a submission in UNMLearn.

In Class Activities (6, 2 points each, lowest score dropped)

In class active learning activities are an alternative to presenting information through a passive lecture. As the name implies, these activities require student to be active participants in the learning process. These activities and worksheets have been designed (and are supported by the learning science) to help students learn information in a more efficient, more effective, and ultimately more engaging way. For the goniometry activity, students will be asked to come to class in athletic clothing and will work with a classmate to measure each other’s joint angles.

Out of Class Activities (4, 2.5 each, no drops)

1. Vertical Jump Lab/Worksheet: Students will use an online application to measure the amount of impulse applied to the ground during a vertical jump. Using theory learned in class, students will calculate measures of linear kinetics and kinematics and estimate how high the athlete jumped. A worksheet will be provided to help guide students through the calculations.
2. Giant Swing Lab/Worksheet: Students will use an online application to digitize the shoulder, hip, and knee of a gymnast as she performs a giant swing. Using theory learned in class, students will calculate measures of angular kinematics and estimate how fast the athlete was swinging at key instants in the rotation. A worksheet will be provided to help guide students through the calculations.
3. Gallery Walk: Students will watch a PBS NOVA specials on “The Family That Walks on All Fours” and will discuss 4 main themes in a group activity called a “gallery walk”. Gallery walks require students walk around the room, add their discussion points to the various “galleries” and to summarize the discussion points associated with each of the themes.
4. Article Assignment: Students will complete a guided reading assignment for the Montoya et al., 2009 article on baseball bat velocity. Students will identify relevant information from the study and connect it to personal experience and theory presented in class.

Gait Laboratory (10 points)

Assessing gait in the Motion Analysis Laboratory is an activity that will summarize much of the functional anatomy and mechanical principles presented over the semester. Students will use traditional biomechanical instrumentation to collect gait data. From the data collected, students will calculate various linear kinematic measures used to describe gait. Students will explain functional anatomy during key phases of the gait cycle. Finally, students will evaluate their data against normative values from the literature.

**HOW WILL I BE GRADED?**

|  |  |
| --- | --- |
| **Course Requirement** | **Points** |
| Exam 1 | 15 Points |
| Exam 2 | 15 Points |
| Exam 3 | 15 Points |
| Exam 4 | 15 Points |
| Gait Laboratory | 10 Points  |
| Formal Quizzes (6) Lowest Score Dropped | 10 Points (2 each) |
| 4 Out-of-class activities/assignments | 10 Points (2.5 each) |
| In-class activities (6) Lowest Score Dropped | 10 Points (2 each) |
| **GRADE** | **POINTS** | **GRADE** | **POINTS** |
| A | 94.0-100 | C | 74.0-76.9 |
| A- | 90.0-93.9 | C- | 70.0-73.9 |
| B+ | 87.0-89.9 | D+ | 67.0-69.9 |
| B | 84.0-86.9 | D | 60.0-66.9 |
| B- | 80.0-83.9 | F | <60.0 |
| C+ | 77.0-79.9 |  |  |

**BALANCING LEARNING AND PROFESSIONALISM**

**Participation**

You are expected to be an active participant when in class. To do this, you must come to class prepared. In order to be prepared, please review material, complete practice problems, and answer review questions after each lesson. The class activities have been carefully designed to help you successfully achieve the course learning objectives. Missing class or not actively participating will negatively impact your ability to learn the material presented.

**Electronics**

Electronics such as laptops, tablets, and smartphones are permitted in class to assist you in your learning. However, if your use is distracting to your classmates (e.g. ringing phones, watching distracting videos, online shopping), you will be asked to refrain from using them in the classroom.

**Learning Accommodations**

Section 504 of the Rehabilitation act of 1973 and the Americans with Disabilities Act of 1990 require the University of New Mexico to provide academic adjustments or the accommodations for students with documented disabilities. It is imperative that you take the initiative to bring such needs to the instructor’s attention, as he/she are not legally permitted to inquire.

It is the student’s responsibility to make arrangements for any special needs and the instructor’s responsibility to accommodate them with the assistance of the Office of Disability Services for Students. If you think you need alternative accessible formats for undertaking and completing coursework, please contact the Accessibility Resource Center at 505-277-3506 right away to assure your needs are met in a timely manner.

**Late or Missed Work**

To help develop an important career and life skill, you will need to complete all quizzes, assignments, and exams according to schedule. However, sometimes life happens, making it near impossible to complete the leaning task on schedule.

If you have a personal set of circumstances preventing you from completing some of your work on time, please discuss it with me. When possible, please see me prior to the due date (or as soon as it is possible after) so that we can determine a plan. Please note: extensions are at my discretion and may require the format of the quiz, assignment, or exam to be modified.

**Title IX**

As a UNM faculty member, I am required to inform the Title IX Coordinator at the Office of Equal Opportunity (oeo.unm.edu) of any report I receive of gender discrimination which includes sexual harassment, sexual misconduct, and/or sexual violence. You can read the full campus policy regarding sexual misconduct at <https://policy.unm.edu/universitypolicies/2000/2740.html>. If you have experienced sexual violence or sexual misconduct, please ask a faculty or staff member for help or contact the [LoboRESPECT Advocacy Center](https://loborespect.unm.edu/).

**Academic Integrity**

Learning and teaching takes place best in an atmosphere of intellectual freedom and openness. All members of the academic community are responsible for supporting freedom and openness through rigorous personal standards of honesty and fairness. Plagiarism and other forms of academic dishonesty undermine the very purpose of the university and diminish the value of an education. All graded work, examination answers, reports, quizzes, worksheets, homework, and assignments must be your own.

Students guilty of knowingly using or attempting to use another person’s work as though it were their own, and students guilty of knowingly permitting or attempting to permit another student to use their work or another’s work as their own is subject to receiving a grade of “F” for the overall course. Furthermore, the University reserves the right to take disciplinary action, up to and including dismissal, against any student who is found guilty of academic dishonesty.

Academic dishonesty includes, but is not limited to, dishonesty in quizzes, tests, or assignments; claiming credit for work not done or done by others; hindering the academic work of other students; misrepresenting academic or professional qualifications within or without the University; and nondisclosure or misrepresentation in filling out applications or other University records.

**Behavior and Conduct**

To foster a productive learning environment, the University requires that all students adhere to Code of Student Conduct in the “Pathfinder-Student Handbook” (<https://pathfinder.unm.edu/code-of-conduct.html>).

**AVAILABLE HELP AND SUPPORT**

**CAPS**



CAPS is an award-winning learning assistance program available to all UNM students enrolled in undergraduate classes. CAPS offers peer tutoring and academic support services for over 800 classes each semester. Regular CAPS users graduate faster, more often, and with better grades than students who don’t use CAPS. (<https://caps.unm.edu/>).

**SHAC**



The Student Health and Counseling (SHAC) supports the wellbeing of students through access to the highest quality health care, education and advocacy. Timely interventions for acute mental health and medical problems increase the likelihood that students will complete their educational goals. (<https://shac.unm.edu>)

**ARC**



The Accessibility Resource Center (ARC) recognizes individuals with disabilities as an integral part of a diverse community and is committed to the provision of comprehensive resources to the University community (faculty, staff, and student) in order to create equitable, inclusive, and practical learning environments. (<https://arc.unm.edu>)

**IMPORTANT DATES TO REMEMBER**

|  |  |
| --- | --- |
| 8/19/2019 | Classes begin |
| 8/30/2019 | last day to add sections or change credit hours on loboweb |
| 8/30/2019 | last day to change grade mode on loboweb |
| 8/30/2019 | Last day to PETITION for In-State Tuition Classification (continuing students only) |
| 9/2/2019 | Labor day |
| 9/6/2019 | Last day to drop without “w” grade and 100% tuition refund on loboweb |
| 9/6/2019 | Last day to add sections and/or change credit hours with form. ($10 per transaction; $75 after this date). |
| 9/6/2019 | Census/official reporting date |
| 10/10-10/11/2019 | Fall break |
| 11/8/2019 | Last day to DROP without Dean’s Permission on loboweb |
| 11/28-12/1/2019 | Thanksgiving break |
| 12/6/2019 | Last Day for CHANGE grade mode with form |
| 12/6/2019 | Last Day to ADD sections and/or CHANGE credit hours with forms $75 per transaction. |
| 12/6/2019 | Last day to DROP with Dean’s Permission with form |
| 12/13/2019 | Last day to report removal of Incomplete |
| 12/9-12/14/2019 | Final exams |
| 12/13/2019 | Commencement |