**Lecture Instructor**: Missy Thompson

**E-mail**: mathompson@fortlewis.edu

**Office**: 145 Whalen Gym (in Exercise Science Office)

**Office Hours**: Mon. 9:00 am-3:00 pm, or by appointment

**CRNs**: ES 335-1: 30155, ES 335-1L: 30508, ES 335-2L: 31046

**Credits**: 4

**Year & Semester**: Fall 2019

**Course Format**: lecture + lab

**Lecture Meeting Days/Times & Location**: MWF 8:00-8:55, Skyhawk 150

**Lab Meeting Days/Times & Location**: ES 335-1L: Tue. 2:30-4:30, ES 335-2L: Mon. 1:25-3:25, Skyhawk 140

COURSE DESCRIPTION**:** An in-depth study of the basic body movements, osteology, applied myology, spatial relations of muscles and joints, aggregate muscle action, kinesiologic constructs of summation of internal forces, aerodynamics and hydrodynamics, techniques for cinematographical and noncinematographical analysis of sport skills. The study of methods, mechanics and analysis of movement as applied to the structure and function of the human organism will also be discussed

PREREQUISITES: Successful completion of BIO 233.

COURSE LEARNING OBJECTIVES:

* Students will be able to apply equations of linear and angular motion to solve problems related to human movement.
* Students will understand and demonstrate the role of different types of forces and torques acting upon and within the human body, as well as apply this information in analyzing human movement.
* Students will understand and demonstrate the concepts of work, energy and power, as well as demonstrate how these variables relate to metabolic energy consumption.
* Students will understand the mechanical properties of biological tissues and be able to apply these principles to function, movement and injury.
* Students will be able to conduct qualitative and quantitative biomechanical analyses.

EXERCISE SCIENCE LEARNING OUTCOMES:

* Apply evidence-based practices in real-world scenarios.
* Analyze information in the field to inform scholarship and practice in the field of exercise science.
* Communicate effectively in written, oral, visual, and electronic forms to foster inquiry, collaboration, and engagement in the field of exercise science.
* Be able to identify, research and apply scientific information in order to address and evaluate exercise science related issues.
* Demonstrate professional ethics, behavior, leadership and social responsibility, which includes valuing diversity, promoting collaboration, and providing service to others.

LAND ACKNOWLEDGEMENT:

I would like to acknowledge that the land we gather on at Fort Lewis College is the ancestral lands and territories of Nuchu (Ute), Apache, the Pueblos, Hopi, Zuni, and the Diné Nation. It is important to provide this acknowledgment because the narratives of this land and region have long been told from one dominant perspective, without full acknowledgment of the tribes who lived on this land before it was Fort Lewis College. Thank you for respecting this important history.

COURSE RESOURCES:

* You will need a calculator that is capable of exponents and trig functions (cell phone calculators are not allowed on exams).
* A straight edge/ruler is recommended, but not required.

## CREDIT HOUR STATEMENT:

One credit hour is equivalent to one hour of guided instruction (50 minute class) and a minimum of two hours of out-of- class student work each week for approximately 15 weeks for one semester.  The typical student in this 4 credit course should expect to spend at least 12 hours per week of concentrated attention on course-related work, including but not limited to time attending class/lab, as well as out-of-class time spent reading, reviewing, organizing notes, preparing for upcoming quizzes/ exams, problem solving, developing and completing projects, and other activities that enhance learning.

## CANVAS:

Class materials (readings, lecture notes, homework assignments, labs, readings) will be available through [Canvas](http://courses.fortlewis.edu/). If you are not familiar with Canvas, please work through the [Student Canvas Orientation](https://courses.fortlewis.edu/courses/6805). For technical help with Canvas contact the 24/7 support hotline at 855-971-1611 or submit a HELP ticket in Canvas.

## DIGITAL ACCESS:

All out-of-class assignments will be provided and submitted via [Canvas](https://courses.fortlewis.edu/), in-class assignments will be provided for you. Work for this class will require a computer, reliable internet access, and possible use of other hardware and software.  It will be especially important that you have, or that you can access at FLC or elsewhere, the latest versions of Chrome or Firefox. An older computer and/or computer that does not allow you to install the newest versions of these programs will not work for your classes at FLC.

## TURNITIN PLAGIARISM DETECTION SOFTWARE:

Plagiarism occurs when someone presents the ideas or work of another person as their own, without giving proper credit.  Turnitin is a software used to detect and prevent plagiarism.  Written assignments in this course will be required to undergo assessment of their originality by Turnitin.  Turnitin will also be used to reinforce best practices when using and citing the work of others.  By taking this course, students acknowledge and give their consent that their papers (Analysis Project, Final Project) will be submitted to Turnitin and that those papers will be included in a secure repository, used for comparison to papers submitted by others in the future. All Turnitin submissions will take place within Canvas.  Reports generated by Turnitin will be available to students.  If asked to generate Turnitin reports for rough drafts of submissions, the student is responsible for making all necessary changes to ensure a lack of plagiarism in the final drafts. Please visit [turnitin.com](http://turnitin.com) for copies of policies, including proprietary rights, privacy, security, and FERPA compliance.  Students under the age of 18 should also refer to the “Student Age” heading in FLC’s Terms and Conditions, located at:<https://www.fortlewis.edu/Portals/145/TermsAndConditionsWithStudentPaymentPolicies-8_30_17.pdf>

## ASSESSMENTS & GRADING:

|  | **Course Requirements:** | **Points** | **Percentage** |
| --- | --- | --- | --- |
| Lecture80% | Homework Assignments | 10 x 20 points = 200 points | 20% |
| In & Out of Class Activities | Variable (equivalent to 100 points) | 10% |
| Exams  | 3 x 120 points = 360 points | 36% |
| Analysis Project | 70 points | 7% |
| Final Project | 70 points | 7% |
| Lab20% | Lab | 14 x 20 points = 280 points (lab & lecture points are not equivalent)  | 20% |
| **TOTAL:** | **100%** |

All students are required to complete:

Homework: There will be 10 homework assignments; each is worth 20 points for a total of 200 points. All homework assignments will be posted on Canvas. Homework assignments are due promptly by the due date/time that is posted on Canvas. Late homework assignments will not be accepted for credit.

In & Out of Class Activities: There will be multiple in and out of class activities that will be completed for a total of 10% of your course grade (individual points vary). In-class activities will not be announced ahead of time, you must be present and actively participate to receive credit. Out of class activities will be announced during class and posted on Canvas.

Exams: There will be 3 exams. Exams are not cumulative and are worth 120 points each, for a total of 360 points. Exams will require application of the topics presented in class. Exams are closed note; an equation sheet will be provided. Cell phone calculators are not allowed.

Analysis Project: Students are required complete a biomechanical analysis project that is worth 70 points. There will be a few course periods dedicated to work on this project throughout the semester. This can be completed as a group; maximum group size is 3 students. Information for this assignment will be posted on Canvas.

Final Project: Students are required to complete a final project that is worth 70 points. This project will involve applying many of the biomechanical principles that are covered in the course and presenting your results to the class. This can be completed as a group; maximum group size is 3 students. Information for this assignment will be posted on Canvas.

Lab Activities: There will be 14 lab activities; each is worth 20 points for a total of 280 points. Lab activities will make up 20% of your final ES 335 course grade (please note that lab/lecture points are not equivalent). All lab activities will be posted on Canvas. Each

lab is worth 20 points, which consists of 3 points for the pre-lab quiz and 17 points for the lab activity.

* To be eligible for the pre-lab points (3 points) you must arrive on time with your lab printed or accessible on tablet/laptop (cell phones are not allowed). Pre-lab quizzes will cover the lab protocol and require that you have read the lab ahead of class.
* To be eligible for the lab activity points (17 points) you must be present and actively participate in the activity. Lab activity points will be based on your results and lab write-up. If lab activities are not completed during the lab, they must be handed in promptly by the start next lab class. Late lab assignments will not be accepted for credit.

### GRADE SCALE:

A 94-100%

A- 90-93%

B+ 87-89%

B 83-86%

B- 80-82%

C+ 77-79%

C 73-76%

C- 70-72%

D+ 67-69%

D 63-66%

D- 60-62%

F <59%

COURSE EXPECTATIONS:

* You are expected to work, individually and together with your classmates, to create an atmosphere that is safe, valuing of one another, and open to diverse perspectives. You are expected to show courtesy, civility, and respect for one another and for me, the instructor. Comments that degrade or ridicule another, whether based on individual or cultural differences, are unacceptable.
* If you have concerns, questions, problems please contact me immediately. I’m here to help!
* Late work will only be accepted if you have contacted me prior to the due date and an extension has been granted. If a major personal problem or illness develops, please contact me BEFORE missing a class. I am easy to contact via phone, text or e-mail.
* Class participation is required; please speak up. Read materials before coming to class.
* You must show your work to receive credit.
* Please ask before attending a different lab section.
* I reserve the right to modify items on the syllabus.

TUTORING:

Tutoring is available through these FLC resources:

* [Office of Peer Education](https://www.fortlewis.edu/peereducation/)
* [STEM3](https://www.fortlewis.edu/stem3/Tutoring.aspx)
* [Native American Center](https://www.fortlewis.edu/native-american-center/AcademicSupport.aspx)
* [TRIO Student Success Center](https://www.fortlewis.edu/trio)

COLLEGE POLICIES:

* Students with disabilities: Fort Lewis College is committed to providing all students a liberal arts education through a personalized learning environment. If you think you have or you do have a documented disability which will need reasonable academic accommodations, and/or if you are a Veteran who may need services, please contact the Disability Services Office, 280 Noble Hall, 970-247-7383, disabilityservices@fortlewis.edu for an appointment as soon as possible.
* Academic Integrity\ Academic Dishonesty Policy: Academic dishonesty includes all forms of unethical or illegal behavior which affects a student’s academic standing, including, but not limited to, cheating on exams, plagiarism, forgery of academic documents, falsification of information on academic documents, or unauthorized access to computer files containing academic information. Academic dishonesty may result in sanctions ranging from a lowered grade on a particular assignment to an “F” in the class and report submitted to the Office of the Vice President of Academic Affairs. For more information visit the [policy on academic dishonesty](http://www.fortlewis.edu/Portals/12/Docs/PART-III-Academic-Dishonesty.pdf)
* Course Withdrawal Information: The last day to withdraw from FLC classes with a grade of “CW” (course withdrawal) is Friday, March 27th. This is a college-wide deadline that is not negotiable. To withdraw from this course, go to the [Registrar’s](https://www.fortlewis.edu/registrar/) Office, Room 160, Miller Student Services Building before the course withdrawal deadline. They will help you through the process. You do not need my signature on the course withdrawal request form. Starting Fall 2013, students have a lifetime limit of three individual course withdrawals from FLC courses. If you have withdrawn from classes before Fall 2013, these will not count towards your lifetime limit. Also, withdrawing entirely from a semester (all classes) does not count against your lifetime “CW” limit. Semester withdrawal is handled under a different policy and procedure. Please refer to the Academic Policies section of the Fort Lewis College Catalog of Courses for more information about course and semester withdrawal policies and procedures.
* Digital Accessibility Policy: Fort Lewis College commits to ensuring that information technology and digital content it creates or distributes in its programs, services and activities is accessible to all individuals.  The [Policy on Accessibility of Information Technology and Digital Content](https://wiki.fortlewis.edu/display/POL/Accessibility%2Bof%2B%2BInformation%2BTechnology%2Band%2BDigital%2BContent) reflects Fort Lewis College's commitment to providing access to information technology and digital content to all FLC students, employees and the general public.
* For all other academic policies please see your catalog.

PROPOSED COURSE SCHEDULE (subject to change)

| **DATE** | **TOPIC** | **READING** | **ASSIGNMENTS** |
| --- | --- | --- | --- |
| Mon., Jan. 13 | Introduction/Review | Intro to Biomechanics |  |
| Wed., Jan. 15 | Review/Kinematics | Kinematics |  |
| Fri., Jan. 17 | Kinematics |  |  |
| LAB Week #1 | Introduction--Review |
| Mon., Jan. 20 | Kinematics | Kinematics-Problem Solving | Homework #1 |
| Wed., Jan. 22 | Kinematics  |  |  |
| Fri., Jan. 24 | Kinematics |  |  |
| LAB Week #2 | Kinematic Analysis |
| Mon., Jan. 27 | Kinematics |  | Homework #2 |
| Tue., Jan. 28 | Deadline for dropping without a recorded grade (Census Date) |
| Wed., Jan. 29 | Kinematics | Projectile Motion |  |
| Fri., Jan. 31 | Kinematics |  |  |
| LAB Week #3 | Center of Mass  |
| Mon., Feb. 3 |  | Kinetics | Homework #3 |
| Wed., Feb. 5 | Kinematics |  |  |
| Fri., Feb. 7 | Kinematics |  | **Exam#1** |
| LAB Week #4 | Projectile Motion |
| Mon., Feb. 10 | Analysis Project Work Day | Specific Forces |  |
| Wed., Feb. 12 | Kinetics |  |  |
| Fri., Feb. 14 | Kinetics |  |  |
| LAB Week #5 | Force |
| Mon., Feb. 17 | Kinetics | Torque | Homework #4 |
| Wed., Feb. 19 | Kinetics |  |  |
| Fri., Feb. 21 | Kinetics |  |  |
| LAB Week #6 | Kinetics |
| Mon., Feb. 24 | Kinetics |  | Homework #5 |
| Wed., Feb. 26 | Posture & Balance | Posture & Balance |  |
| Fri., Feb. 28 | Posture & Balance |  |  |
| LAB Week #7 | Aerodynamics |
| Mon., March 2 | Posture & Balance |  | Homework #6 |
| Wed., March 4 | Posture & Balance |  |  |
| Fri., March 6 | Posture & Balance |  | **Exam #2** Last day to withdraw |
| LAB Week #8 | Balance and Posture |
| Mon., March 9 | Analysis Project Work Day |  |  |
| Wed., March 11 | Material Properties | Material Properties |  |
| Fri., March 13 | Material Properties |  |  |
| LAB Week #9 | ROM |
| **Spring Break March 16-20** |
| Mon., March 23 | Material Properties |  | Homework #7 |
| Wed., March 25 | Musculoskeletal System | Skeletal System |  |
| Fri., March 27 | Musculoskeletal System |  |  |
| LAB Week #10 | EMG |
| Mon., March 30 | Musculoskeletal System | Muscular System | Homework #8 |
| Wed., April 1 | Musculoskeletal System |  |  |
| Fri., April 3 | Musculoskeletal System |  |  |
| Sun., April 5 |  |  | **Analysis Project Due (11:59pm)** |
| LAB Week #11 | Exercise Analysis |
| Mon., April 6 | Work, Energy, Power | Work, Energy, Power | Homework #9 |
| Wed., April 8 | Work, Energy, Power |  |  |
| Fri., April 10 | Work, Energy, Power  |  | **Exam #3** |
| LAB Week #12 | Work, Energy & Power  |
| Mon., April 13 | Application-Gait | TBD—see Canvas |  |
| Wed., April 15 | Application-Gait |  |  |
| Fri., April 17 | Application-Gait |  |  |
| LAB Week #13 | Bike Fit |
| Mon., April 20 | Application-Gait | TBD—see Canvas |  |
| Wed., April 22 | Application-Gait |  |  |
| Fri., April 24 | Application-Gait |  | Homework #10 |
| LAB Week #14 | Gait Analysis |
| **Final Exam-Final Project Presentations:****Mon., April 27 7:30-9:30 AM**  |