PHYS 199: Physics of Climbing  
Winter 2020

Syllabus

The course is an introduction to the basic physics principles behind climbing. No science prerequisites are required, but students must have completed at least one Outdoor Program climbing course: PEO 251 (Rock Climbing 1), or have equivalent experience and permission from the instructor. In the course we’ll use anchor construction to explore how forces work in 1-d, 2-d, and 3-dimensions, using vectors, conditions for statics, static versus dynamic load, and breaking strength. In top rope and lead climbing we’ll explore dynamics, including the importance of a dynamic rope, fall factor, effective forces on anchors, gear placement, belayer, etc. We’ll also explore the importance of helmets, cycling versus climbing helmets, and effect of rapid deceleration on the body and brain. Through rigging and mechanical advantage, we’ll explore pulleys, friction. The emphasis will be on connecting physics to climbing systems, equipment, and techniques through interactive discussions as well as hands-on “laboratory” work.

Objectives

The objectives of the course is to gain a deeper understanding of the physics beyond climbing and climbing equipment. The course expectations are that you attend every class, complete the “learning reviews” and give an excellent final project/presentation.

Useful References: I’ll provide as the course progresses.

Instructor: Prof. Graham Kribs

Office: 477 Willamette Hall

Office Hours: Generally, anytime my door is open, but best to email me to verify my a particular day’s schedule.

E-mail: kribs@uoregon.edu
   (This is the best way to reach me)

Class Communication: I will use email to your UO email address for class communication, and use a shared Dropbox for learning reviews, auxiliary material, and other relevant information.
Learning Reviews: Each week you will write a 1/2 to 1 page description of what happened in the previous class, what things you already knew, what you learned, what was still confusing, what demonstrations worked, and what didn’t work. Here I’m interested in you reflecting on how the class helped illustrate why various aspects of climbing are done the way they are, or why equipment is designed in a particular way (or to a particular tolerance). The learning reviews are due Mondays by 5pm in your dropbox folder.

Final project/presentation:
More details will be given about midway through the quarter. The final project/presentations will be scheduled the last week of classes.

Grade:
80% Assignments
20% Mini-Lecture/Presentation

Grading Policy:
A-level: All of the learning reviews are clear, detailed, appropriate length, and have been turned in on time. The final project/presentation is clear, well-organized, understandable, questions are adequately addressed.
B-level: Most of the learning reviews are clear, detailed, appropriate length, and have been turned in on time. No more than one learning review was not turned in / incomplete. The final project/presentation is mostly clear, decently-organized, understandable, and many questions are adequately addressed.
C-level: Some of the learning reviews are clear, but several of them are not or were not turned in. The final project/presentation was acceptable but had issues with clarity, organization, understanding, and/or many questions could not be answered.
Below C: Not completing most of the work adequately; a dismal performance on the final project/presentation.

Class Cancellation: In theunlikely event that I have to cancel class at the last minute (bad weather or otherwise), I will attempt to email everyone.