

Class Meeting: **MWF** 8:40-10:00am
 Class & Lab Location: Heg 107
 Office Hours: **M 1-3pm & F 3-4pm**
 Lab A: **W** 2-4pm

Email: haggard@bard.edu
 Office: Rose 112
 Office Phone: (845) 758-7302
 Lab B: **Th** 2-4pm

Course Description — We will explore the Physics of motion. This is a surprisingly rich pursuit; in particular, the art of doing physics turns out to be choosing what to ignore. The physical world around us is overflowing with detail and complexity and to study one facet we often must ignore another. In this course we will discover the unreasonable effectiveness of Newton’s approach to this art and the resulting insights into *predicting* how things move and why. In particular, we will develop a full quantitative description of motion and its relationship to *momentum*, *force*, and *energy*. You will become fluent at alternating between conceptual and quantitative forms of explanation, and polish your incisive, scientific thinking.

Text: *Fundamentals of Physics*, by D. Halliday, R. Resnick, and J. Walker (10th Ed, Aug 2013)

Week	Topics	Lab	Chap.
8/30	Motion in 1D: Position, velocity, acceleration. Check out: The Hidden Value of Ignorance &	No Lab Radiolab: \leq kg	1 & 2
9/6	Constant acceleration. Projectile motion.	Measuring Time	2
9/13	Vectors, vector products. 2-D and 3-D motion.	Vector Addition	3 & 4
9/20	Momentum & Mass	Ballistic Motion	9
9/27	Forces & Newton’s laws of motion.	Exam 1	5
10/4	Tension, Springs, Friction. Work.	Prob. S.: Springs	6
10/11	Fall Break 10/11-10/12 Energy & Work.	No Lab	7
10/18	Potential Energy & Power	Conservation Laws	8
10/25	Rotational Motion	Collisions: Design	10
11/1	Torque & Angular momentum.	Collisions: Execute	11
11/8	Gravitation & Planetary Motion	Exam2	13
11/15	Simple Harmonic Motion & oscillations.	Rotation	15
11/22	Special Relativity. Thanksgiving 11/25-11/28	Problem Solving	37
11/29	Waves	Harmonic Motion	16
12/6	Sound & Interference. Advising Day 12/8	Waves on String	17
12/13	Completion days. 12/17 Last day classes	Exam 3 12/15	

Note: I reserve the right to adjust this syllabus during the semester

Course website: faculty.bard.edu/hhaggard/teaching/phys141Fa21/

Exam 1 (10/1): Motion problems in 1-D, 2-D, 3-D. Momentum.

Exam 2 (11/12): Momentum, Forces, and Energy.

Exam 3 (12/15): Comprehensive. Rotation. Oscillations & Waves.

Homework — There will be homework due every **Tuesday at 11:59am** and homework meetings every week. The goal of the homework is for us to engage each other in a discussion of physics regularly, please come and visit as often as you like to chat. Along these lines, I recommend that you work together; this is invaluable in learning physics. Please

write things up yourself to show me *and you* that you understand it (this helps battle the illusion of explanatory depth, or [knowledge illusion](#)). All the physics faculty are committed to helping you and there will be two course tutors doing help sessions for the course; they will give you clues on solving the problems. Please do not use the internet as a resource for finding problem solutions; you are welcome to watch lectures and look up definitions on the internet.

Grading Structure

Homework (due Tu by 11:59am)	27%
Lab Reports (Sat/Sun by 11:59pm)	20%
Participation & Quizzes	8%
Exam 1	15%
Exam 2	15%
Exam 3	15%

Bard Physics Intro Courses Lab Policy — We will have lab most Wednesdays/Thursdays, see table above for dates. Attendance is **required** at all lab sessions. If you miss a lab meeting, your course grade will be lowered by one level (e.g. from B+ to B) for each lab that you miss. Chronic lateness may also lower your grade. We will discard your lowest lab score, and average the remaining lab scores to come up with a grade for the lab.

If you have a problem that will keep you from being in lab, you need to discuss this with your instructor in advance. We will see what we can do to help out; we may ask you to attend a different lab section. Generally, it is not possible to make up a lab that you missed. Your lab reports will be due on the **Saturday (for W lab) or Sunday (for Th lab)** after your lab by 11:59pm.

Exams — During the exam times (basically, all of the lab periods that week) you take the exam in the lab or nearby, and return it two hours later. You can bring your calculator and one sheet of paper with whatever notes or formulas you want on it, but otherwise these are closed book, closed note exams. You must not collaborate or consult with anyone else while taking the exam. I will give more specifics as we review the material before each exam.

Accessibility — If you anticipate issues related to the format or requirements of this course, please meet with me. I would like to support everyone's full participation in the course. Students who have already been approved to receive academic accommodations through disability services should share their accommodation letter and make arrangements for us to meet as soon as possible. If you need to register a learning difference or disability, you can contact Disability Support Services at disabilityservices@bard.edu. The Coordinator will confidentially discuss the process to establish reasonable accommodations. Please note that accommodations are not retroactive and require advance notice to implement.

I have read over this syllabus. I commit to stick to the parameters of the exams. I agree to never use the internet to look up problem solutions and only as a resource for understanding definitions of terms and conceptual aspects of the course. I agree not to use my cell phone in class. I will strive to be my best self in this course, both in how I interact with everyone involved and with respect to my efforts.

Signed:

Date: