

Physics 141: Introductory Mechanics – Spring 2020

A first course in Newtonian mechanics; introduces freshman-level students to the statics and dynamics of point particles, rigid bodies, and fluids. Topics include vector algebra, projectile and circular motion, Newton's Laws, conservation of energy, collisions and conservation of momentum, rotational dynamics and conservation of angular momentum, statics, harmonic oscillators and pendulums, fluid statics and dynamics, gravitation and Kepler's Laws.

Professor: Charles Stafford

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Lectures: WF 10:00–10:50am in PAS 201

Web: <http://d2l.arizona.edu/>

Office hours: Wednesday 3–4pm, Thursday 2–3pm (tentative)

Required Text:

University Physics, by Young and Freedman (15th Ed., Pearson), including *Mastering Physics* (needed for online homework).

Course materials: Course materials are being delivered digitally via D2L through the Inclusive Access program. Please access the material through D2L on the first day of class to make sure that there are no issues with delivery so any problems can be addressed quickly. You automatically have access to the course materials FREE through 01/28/2020. You must take action (even if you have not accessed the materials) to opt-out if you do not wish to pay for the materials, and choose to source the content independently. The deadline to opt-out is 01/28/2020. If you do not opt-out and choose to retain your access, the cost of the digital course materials will appear on your February Bursars account. Please refer to the Inclusive Access FAQs at <https://shop.arizona.edu/textbooks/Inclusive.asp> for additional information.

Course Prerequisites: Math 122B or 124 or 125 (Calculus I)

Grading scheme:

Your grade in this course will be based on your cumulative score, which is determined as follows:

Homework on <i>MasteringPhysics</i> (15 assignments, weekly)	10%
Recitation activities	10%
Exam 1 (February 14)	12%
Exam 2 (March 27)	12%
Exam 3 (April 24)	12%
Laboratory	19%
Final Exam (Wednesday 5/13/2020 6:00–8:00 pm)	25%

Grading scale:

87–100	A
74–87	B
60–74	C
50–60	D
0–50	E

Photo ID required when turning in Exams

You must show proof of identity when turning in your exam. Acceptable photo IDs are a UA Cat Card or AZ Driver's License.

Scientific (graphing) calculator and 3" x 5" equation sheet (one side) allowed on Exams 1–3.

MasteringPhysics online homework

There will be 15 homework assignments due weekly using *MasteringPhysics*. Access to *MasteringPhysics* is provided through Inclusive Access in D2L. If you choose to opt out of Inclusive Access, you *may* be able to purchase separate access to *MasteringPhysics* through Pearson. (At this point, I don't know how or if that would work.) The first homework assignment using MasteringPhysics will be CH 01 HW due January 22.

Course Format and Teaching Methods

Lecture, lab, and recitation combination with web-based interactive homework. Interactive activities in lecture will be handled using the *tophat app* accessed on your mobile phone or wifi-enabled tablet or laptop, and will be worth 12.5% of your recitation grade.

TopHat registration

If you were enrolled in the course as of January 14, you should receive an invitation email from TopHat.com. Alternatively, you can go to app.tophat.com/register/student/ and enter the 6-digit join code **390668**. For more info contact support@tophat.com.

Course Communications

All online communications should be sent to staffordphysics92@gmail.com.

Final Exam

Wednesday 5/13/2020 6:00–8:00 pm.

Scientific (graphing) calculator and 8.5" x 11" equation sheet (one side) allowed.

Final Exam Regulations:

<https://www.registrar.arizona.edu/courses/final-examination-regulations-and-information>

Final Exam Schedule: <http://www.registrar.arizona.edu/schedules/finals.htm>

Learning Outcomes

- Recognize the vocabulary and units of mechanics.
- Understand the concepts, laws, and principles used in mechanics and generate associations between the concepts and laws. Apply concepts and laws to both qualitative and quantitative problems.
- Work cooperatively within a group on problem solving.
- Use fundamental physical principles to understand how everyday objects work.

Absence and Class Participation Policy:

Attendance of the laboratories and exams is mandatory.

A missed exam or homework due to an excused absence or a planned absence that is documented ahead of time by the student and approved by the instructor will be substituted with a make-up exam or homework or an alternative arrangement at the discretion of the instructor.

All work to be considered for a regrade must be submitted at most one week after it was returned.

The UAs policy concerning Class Attendance, Participation, and Administrative Drops is available at: <http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop>

The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable, <http://policy.arizona.edu/human-resources/religious-accommodation-policy>.

Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See: <https://deanofstudents.arizona.edu/absences>

Required Special Materials

A scientific calculator is needed for the exams and other coursework. A cell phone, or wifi-enabled tablet or laptop is required for in-lecture activities.

Classroom Behavior Policy

To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming, and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. To that end, our focus is on the tasks at hand and not on extraneous activities (e.g., texting, chatting, reading a newspaper, making phone calls, web surfing, etc.).

Students are asked to refrain from disruptive conversations with people sitting around them during lecture. Students observed engaging in disruptive activity will be asked to cease this

behavior. Those who continue to disrupt the class will be asked to leave lecture or discussion and may be reported to the Dean of Students.

Threatening Behavior Policy

The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to oneself.

See <http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>

Accessibility and Accommodations

Our goal in this classroom is that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcome to contact the Disability Resource Center (520-621-3268) to establish reasonable accommodations. For additional information on the Disability Resource Center and reasonable accommodations, please visit <http://drc.arizona.edu>.

If you have reasonable accommodations, please plan to meet with me by appointment or during office hours to discuss accommodations and how my course requirements and activities may impact your ability to fully participate.

Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

Code of Academic integrity:

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog.

See: <http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity>

The University Libraries have some excellent tips for avoiding plagiarism, available at <http://www.library.arizona.edu/help/tutorials/plagiarism/index.html>

If you decide to take and continue in this course, you are agreeing to submit your papers online, when so instructed, to a plagiarism-prevention program called TurnItIn.com via the d2l drop box. You should note that TurnItIn.com, always without your name and any personal information, will retain your paper as part of their database so that students who plagiarize from it can be detected. Because of this program, the vast majority of you who do your own work and cite your sources of information properly will not have to compete with students who commit undetected plagiarism.

Selling class notes and/or other course materials to other students or to a third party for resale is not permitted without the instructors express written consent. Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. Additionally, students who use D2L or UA e-mail to sell or buy these copyrighted materials are subject to Code of Conduct Violations for misuse of student e-

mail addresses. This conduct may also constitute copyright infringement.

Cheating:

Cheating is unacceptable and will not be tolerated. If you are caught cheating, it is my responsibility to report the incident to the Dean of Students. The incident will become part of your official student record, visible to any schools you may apply to in the future. If you are caught cheating in this class, the minimum penalty you can expect (in addition to my reporting the incident) is a failing grade in the class.

UA Nondiscrimination and Anti-harassment Policy

The University is committed to creating and maintaining an environment free of discrimination; see <http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy>

Our classroom is a place where everyone is encouraged to express well-formed opinions and their reasons for those opinions. We also want to create a tolerant and open environment where such opinions can be expressed without resorting to bullying or discrimination of others.

Additional Resources for Students

UA Academic policies and procedures are available at <http://catalog.arizona.edu/policies>

Student Assistance and Advocacy information is available at <http://deanofstudents.arizona.edu/student-assistance/students/student-assistance>

Homework (HW):

There will be interactive online HW administered through www.masteringphysics.com. HW is an extremely important part of this class. First, it is worth 10% of your grade. Second, it is critical to do the HW or you will not be able to do well on the exams.

You are encouraged to work in groups to learn from one another. However, you must understand all the solutions yourself and do your own work on the online homework.

The HW assignments are long; they will take several hours each week.

Guidelines for success in this course:

Physics is a difficult subject. You cannot learn it just by listening to the lectures. You can only learn by *doing it*. You must participate in classroom activities and work hard outside of class, reading the text and completing the homework, to learn the material.

You cannot *memorize* physics. You must *understand* the equations and the concepts behind them. Otherwise, it will be difficult if not impossible to use the equations correctly.

It is important for you to read the textbook and study its examples. You should read the appropriate sections of the text before you begin each homework assignment.

Physics 141 Schedule

Schedule of topics, exams, and assigned reading in *University Physics*:

Week 1 Introduction: Units and vectors, Ch. 1

Week 2 1D motion, Ch. 2

Week 3 2D/3D motion, Ch. 3

Week 4 Newton's laws, Ch. 4

February 14 Exam 1

Week 5 Applications of Newton's laws, Ch. 5

Week 6 Circular motion, Ch. 3.4 and 5.4

Week 7 Energy I, Ch. 6; Ch. 1.10

Week 8 Energy II, Ch. 7

Week 9 Momentum and collisions, Ch. 8

March 27 Exam 2

Week 10 Rotations, Ch. 9

Week 11 Rotational dynamics, Ch. 10

Week 12 Equilibrium, Ch. 11

Week 13 Oscillations, Ch. 14

Week 14 Fluids, Ch. 12

April 24 Exam 3

Week 15 Gravitation, Ch. 13

Wednesday, May 13, 6:00–8:00 pm Final Exam

Version 1-14-2020. Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with reasonable advance notice, as deemed appropriate by the instructor.