PHYS 2210: PHYSICS FOR SCIENTISTS AND ENGINEERS I

Fall 2021, Physics & Astronomy Department, University of Utah

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Updated August 28, 2021. Syllabus subject to change: This syllabus is meant to serve as an outline and guide for our course. Please read it carefully. Please note that I may modify it with reasonable notice to you. Any changes will be announced in class and posted on Canvas.

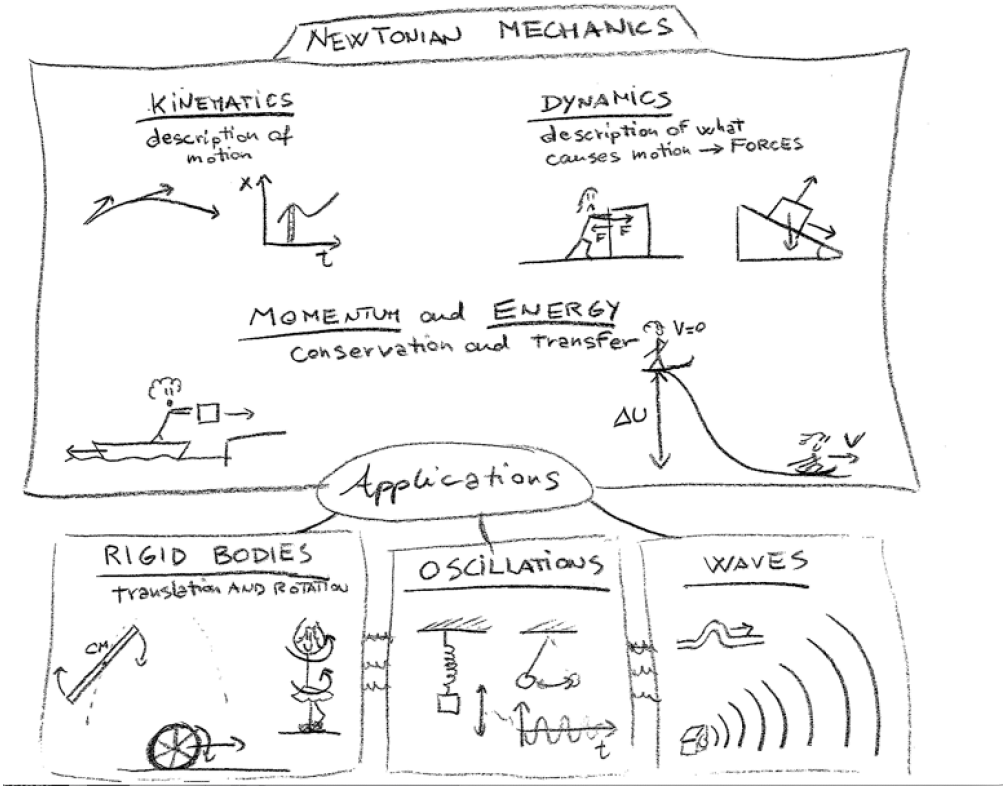

Figure 1: Illustrative overview of topics covered in PHYS 2210.

Contents

1 Your learning goals

> Significant learning combines the logical and the intuitive, the intellect and the feelings, the concepts and the experience, the idea and the meaning. When we learn in that way, we are whole. *Carl Rogers, 1983*

PHYS 2210 is the first of a two-part sequence, calculus-based course in introductory physics. In class we will explore standard concepts in classical mechanics such as kinematics, dynamics, energy, momentum, rotation of a rigid body, oscillations and waves. The class will assume a working knowledge of calculus. After successful completion of this course, you should be able to:

- Appreciate the power of physics and mathematics to deepen your scientific understanding of some of the physical phenomena we observe everyday.
- Identify, apply, and master problem solving strategies to reach a quantitative understanding in a variety of circumstances.
- Monitor your learning process, understand your mistakes, and develop strategies for success and improvement.
- Collaborate productively in a group and learn from your peers.

In addition, I hope that you will:

- Further develop your own passion for learning, not be afraid of being challenged, believe in yourself as capable of improvement.
- Be creative, have fun and make good friends.

2 Welcome from the Teaching Team

This class strives to be an inclusive community, learning from the many perspectives that come from having differing backgrounds and beliefs. As a community, we aim to be respectful to all. We reject all forms of prejudice and discrimination, including but not limited to those based on age, color, disability, size, gender, gender identity, gender expression, national origin, political affiliation, race, religion, sexual orientation, and veteran status. The instructional staff and students are expected to commit to creating an environment that facilitates inquiry and self-expression, while also demonstrating diligence in understanding how others' viewpoints may be different from their own.

Teaching Assistants (TAs)

Teaching Assistants are graduate or undergraduate students in physics, they are working towards their Bachelor, Master or PhD degree in physics. They will lead discussion sections, staff Study Hall, hold Office Hours, present Reviews and grade Exams and Problem Sets. The names and contacts of the TAs will be posted on the Canvas website on the Teaching Staff page.

Learning Assistants (LAs)

Learning Assistants are undergraduate students who have taken this course previously, or a similar course, and who receive special training on how to help students learn science (see more details on the U of U Learning Assistant program page). LAs will help during class and discussion sections to facilitate student learning, they will also staff Study-Hall and hold Office Hours. LAs are not responsible for grading assignments and can be thought of as peer mentors. The names and contacts of the LAs will be posted on the Canvas website on the Teaching Staff page.

3 Accessibility, accommodations, and meeting your needs

It is my goal to provide you with the tools you need to learn, be engaged, and succeed in my class. I'll make available multiple resources that you can use as best fits your learning style. For example, I'll always post a draft of my slides and lecture notes before class, and I'll post a finalized version for each of them after each class. I'll record my lectures and make them available by the end of the day on the course Canvas site. All videos posted on Canvas will be automatically closed-captioned. I'll have a break in the middle of each class. Although my class is in-person, I'll do my best to provide online alternatives.

- If you have a formal accommodation through the Center for Disability and Access please reach out to me as soon as possible during the first weeks of class. I'll be happy to meet with you to discuss how I can best meet your needs in my class.
- If you don't know about the CDA (Center for Disability and Access) and/or if you may need a formal accommodation, I encourage you to visit the Center for Disability and Access website to learn about the process and eligibility and to schedule an appointment. The CDA gets very busy at the start of the semester the sooner you make an appointment the better. Feel free to reach out to me as well if you like to discuss your situation with me and how I can support you in my class.
- If you don't have or need a formal accommodation but you find any aspect of the course inaccessible to you or if you have any suggestions for me that can help your learning experience in my class, please do not hesitate to reach out to me and I'll do my best to meet your needs. Please send me an email or come talk to me at the end or beginning of class or during study-halls. You can also submit an anonymous comment through the "Anytime Feedback" tool linked on our Canvas homepage.

4 In-person and online synchronous format

Although the format of this class is in person (see schedule and location in the next section **Class meetings**), I'll do my best to provide online synchronous options, so that, in case you are unable or uncomfortable with joining the class meetings in-person, you can do so online. I have extensive experience teaching both in person and synchronously online, but this will be my first semester combining the two. I'm working to ensure the experience will be as smooth as possible for everyone, but I anticipate, as always with something new, that there may be a few instances where things will need to get adjusted and improved. I appreciate your patience while the Teaching Team and myself do our best to provide you with the best learning experience either in person or online. The priority would be to provide continuity of your learning experience.

For the in-person attendance and participation of all the class meetings in this course, I highly encourage you to follow the University's guidelines:

Get Vaccinated, if you are not yet vaccinated, get weekly asymptomatic coronavirus tests
Follow CDC guidelines regarding face masks, which now call for everyone to wear face masks indoors

Please find information about vaccination, testing, and latest Covid-19 Response at
COVID-19 CENTRAL @TheU.

5 Class meetings

Class Times

This course consists of two 80-minute lectures and two 50-minute Discussion Sections every week. Before every lecture you will have some Pre-class Assignments to complete by midnight of the previous day. A typical lecture will be run by the instructor together with the help of Learning Assistants(LAs), it will consist of interactive lecturing, short clicker questions, physics demonstrations and some small group discussions. Discussion Sections will consist primarily of group problem-solving activities and will be run by a Teaching Assistant(TA) with the help of Learning Assistants(LAs). Every other week there will be a quiz administered during Discussion Section. Additional help will be provided via optional Study-Halls.

IMPORTANT: You will be required to attend the Lecture Section and Discussion Section in which you are enrolled. Additionally, you may not attend Lecture and Discussion Sections in which you are not enrolled.

- Lectures: in JFB 103 (James Fletcher Building) or online on Zoom:
  - Section 011- Monday and Wednesday, 1:25-2:45pm
  - Section 021- Monday and Wednesday, 3:00-4:20pm
- Discussion Sections: in location listed below or online on Zoom:
  - 012 Monday-Wednesday 4:35-5:25pm in CSC 10-12 (basement of Crocker Science Center)
  - 013 Tuesday-Thursday 10:45-11:35am in SFEBB 5130 (Spencer Fox Eccles Business Building)
  - 014 Tuesday-Thursday 12:55-1:45pm in JFB 103 (James Fletcher Building)
  - 015 Tuesday-Thursday 2:00-2:50pm in SFEBB 1170 (Spencer Fox Eccles Business Building)
  - 022 Monday-Wednesday 4:35-5:25pm in JFB 101 (James Fletcher Building)
  - 023 Tuesday-Thursday 10:45-11:35am in JFB 101 (James Fletcher Building)
  - 024 Tuesday-Thursday 12:55-1:45pm in ST 205 (William Stewart Building)
  - 025 Tuesday-Thursday 2:00-2:50pm in CSC 10-12 (basement of Crocker Science Center)
- **Study-halls** in JFB 209 (James Fletcher Building) or online on Zoom:
  - Tuesday 3:00pm-5:00pm
  - Wednesday 5:30pm-7:00pm
  - Thursday 9:00am-10:30am and 3:00-6:30pm
- Additional Study-hall times may be added based on needs and they will be announced an posted on Canvas. Keep in mind that Study-hall does serve the purpose of office hours, but with the additional ability to work in groups, see more below about the format of Study-halls.

Zoom links for each of the meetings above will be provided on Canvas.

Punctuality: Please be on time for lectures and Discussion Sections. Due to the logistics required to run a class both in-person and online our Teaching Team appreciates that you regularly join class on time; if you join late, you may not be able to join some of the class activities (e.g. taking a quiz/exam, joining a group).

Attendance: Attendance to the lectures is not mandatory, although strongly recommended. The pace of this class is fast, and attending the lectures will help you stay on track and be prepared; all the material of Discussion Sections, Homework, Quizzes and Exams will rely on what is discussed in class. All lectures will be recorded and posted before the end of the day on Canvas; if you happen to miss a class make sure to watch the recording soon and before the following Discussion Section. **Attendance to Discussion Sections is required** and will contribute to your final course grade. In addition, roughly every two weeks there will be a Quiz administered during Discussion Section. See more details below under **Course work**.

Lecture Recording: Lectures will be recorded on Zoom and made available on Canvas by the end of the day. Only the Active Speaker and Screen Sharing view will be recorded, not the Gallery/participants view nor any time spent in the breakout rooms. The Zoom chat will not be recorded. Therefore, unless you speak during class time, you will not be recorded. Automatic closed captioning will be generated shortly after each recording is uploaded on Canvas. Lecture recording will be available only to students enrolled in this course. The instructor will also be available right before class and right after class for questions and conversations that will not be recorded. If you have any concerns about Recording of the Lectures please reach out to the instructor anytime.

Meeting with the instructor

I will be available for short questions before and after each class and to schedule one-on-one appointments. I'll be at Study-Hall regularly every week on Thursday from 5pm to 6:30pm. Depending on the week, I'll stop by occasionally during other Study-Hall times. Please email me if you want to schedule a time to meet during other Study-Hall times. If you cannot attend Study-Hall, please email me and I'll accommodate your schedule to find a time to meet.

Special Dates

There will be no lecture nor discussion sections on:

- Monday, September 6 (University Holiday: Labor day) and Tuesday, September 7
- During Fall Break: October 11-15
- Wednesday, November 24 (day before Thanksgiving, class is canceled by the instructor)

Study-Halls

There will be the following study-halls each week:

- Tuesday 3:00pm-5:00pm
- Wednesday 5:30pm-7:00pm
- Thursday 9:00am-10:30am and 3:00-6:30pm

The goal of study hall is to provide a place where you can come to do the homework and study for quizzes and exams individually or with other classmates. The instructor, TAs and LAs will be there available to advise you, and answer questions. Because participation in study hall has proven to be an important factor leading to success in physics, **attendance to at least one of these study halls for at least one hour each week is strongly recommended**.
In previous semesters, students have repeatedly expressed their gratefulness and need for study-hall. Below are a few answers from an anonymous survey administered at the end of the semester to the question: "Imagine you could write a short paragraph to be given to next year's students in this course. Please write what you would say to them to help them learn the most in the class."

- "ALWAYS go to study halls. Go to all of them if you can. They are honestly really helpful, especially when you have your instructor or the TAs helping you. It also gets you to collaborate with your fellow peers. You're all in this together, so why not work together? Don't be afraid to ask questions either, whether during study hall or in lecture. Without communication or attending study halls, you won't succeed in this class. Let the instructors help you!"
- "The best experience was the study halls. I made a bunch of new friends through it and I got work done I never could have figured out on my own. Go to the study halls!"
- "Interact with the people around you. Go to study halls and do the problem sets with your peers, but also don't be afraid to talk to the professors and get to know them as well. It makes a huge difference because once you're comfortable with the people around you, you're not afraid to ask questions during class. You're far less likely to feel lost or overwhelmed when you're comfortable enough to sense how you learn best and ask questions."

Study-hall will be held both online in JFB 209 and on Zoom. Depending on your needs, at study-hall you can:

- Work on your own in an individual room and ask for help when you need
- Work in groups: you can choose a group based on the topic or who is in the group, you can move between groups at anytime
- Ask questions or just listen to others' questions
- Ask questions and/or review any of the class material with the Teaching Team or with your classmates
- Work on the Homework (many people start and finish the homework during study-hall coming a few times a week)
- Find classmates to work with and make friends
- Interact with the teaching team and the instructor

IMPORTANT: There is no expectation to come to study-hall with specific questions, you can just drop by and see what people are doing. Most people find helpful to come to study-hall to just listen to others' questions, and work together on the homework. Study-hall should not be interpreted as an extra obligation to this class, instead it's a resource to make your working on the homework more *efficient*. The Instructor and Teaching Team look forward to meeting you at Study-Hall!

6 Classroom expectations and requirements

Classroom guidelines

The following are guidelines for participation and engagement in class either if you join in person or on Zoom. We expect all students to follow these guidelines.

- Be on time. Due to the logistics required to run a class both in-person and online our teaching team appreciates that you regularly join class on time; if you join late, you may not be able to join some of the class activities (e.g. access a quiz/exam, joining a group for quiz/exams).
- Take care of yourself and be aware of others. Feel comfortable to engage, as needed, in any activities that reduce stress or anxiety (stimming, support people, caretaker, support animals, leaving the room for breaks, etc.), but also be open and aware of other members' sensitivities.
- Limit distractions on phones and laptops. Although a laptop and/or cellphone will be required for some in-class activities, please limit the use of these technology to activities related to class. You can make it easier to focus on the lecture or Discussion Sections by turning off notifications, closing or minimizing running apps, and muting your smartphone.
- Avoid multi-tasking. You'll retain the material better if you refrain from replying to emails or text messages during class. There are studies that show how multitasking during class time is detrimental for your learning and affect your class performance.
- Keep any class conversation/questions on-topic. Please limit the in-class or Zoom chat communication to questions/responses related to the material discussed by the instructor in that moment. Feel free to be friendly and chat with your classmates before/after class or during the breaks, during the lecture time please be professional, avoid jokes and stay on topic.
- Respect the TAs/LAs, they are there to help you. TAs and LAs will be around in discussion section or lecture section, they may check in on your group, or pop in and out of breakout rooms. They might not announce themselves, but don't worry, they're just there to check if you need help!

Community guidelines

The following are community guidelines we expect all students in the class to respect during Lecture and Discussion Sections. Your suggestions for this list are welcome!

- Treat your instructor, teaching team, and classmates with respect in any communication (in person or online).
- Be professional in your interactions with the teaching team and your classmates.
- There are no bad questions! All questions are welcome.
- Mistakes are good! Everyone makes them! (including the instructor and TAs)
- Support your peers and help them when you can.
- Learn to collaborate well with others. Make sure to always include everyone in the group.
- Be yourself, be present, engage with the material.

Technical requirements

In order to participate in this course you will be required to:

- Have access to a laptop or desktop computer to access the course Canvas site regularly throughout the week to complete the course assignments. Some features of Canvas and of the online Homework platform do not work on cellphones or tablets, so you'll need a laptop/desktop to be able to access these.
- Be computer literate to be able to easily navigate Canvas as well as other software to scan your homework/exams (e.g. Adobe Scan).
- Be able to access Canvas during the lectures and discussion sections to access worksheets, polling software, etc. A cellphone/tablet may be enough in most situations, but a laptop will be required for Quizzes and Exams.
- Bring a laptop computer to class to access Quizzes and Exams on Canvas.

A regular scientific calculator (not a graphing calculator) may be needed for some of the homework questions. For exams and quizzes you will NOT need a calculator. Calculators will NOT be permitted during exams or quizzes.

Electronic or equipment failure: It is your responsibility to maintain your computer and related equipment in order to participate in the online portion of the course. Equipment failures will not be an acceptable excuse for late or absent assignments.

Note: Access to some technology equipment is available to students through the Marriott Library.

Technical requirements: Zoom attendance

If/when you choose to join class online on Zoom you will be required to:

- Join any Zoom meetings for this course through your U of U Zoom account (not a personal account). To access your account please go to https://utah.zoom.us you'll be redirected to the University's Single Sign On page, where you will use your UNID and CIS password. If you are accessing through the Zoom app you will need to sign in with the SSO option and then you'll be redirected to the University's Single Sign On page, where you will use your UNID and CIS password. Make sure to practice accessing your U of U Zoom account in advance to sort out any log in issues.
- Make sure to keep your Zoom app updated to the latest version (How to Upgrade / update to the latest version).
- Display your name as it appears on Canvas (unless instructed differently). Feel free to add your pronouns.
- It will be recommended that you join Zoom sessions with audio and video enabled. **During proctored quizzes and exams, you will be required to have your video and audio enabled.**
- To help keep background noise to a minimum, please keep yourself muted unless you are speaking.
- Please raise your virtual hand before speaking (unless instructed differently).
- You are encouraged to have your camera on, especially when you are doing group work in small breakout rooms with your classmates. Doing so helps create a more direct sense of engagement with other participants. If you prefer not having your camera on, or have connection issues, please make sure to find alternative ways to effectively engage with the class and your classmates (e.g. speaking, typing in the chat).

Proctoring of Quizzes and Exams Online

Exams and quizzes will be administered and proctored in person, but online proctoring accommodations may be provided with the instructor permission. Please email your instructor within the two first week of classes (by September 3rd at the latest) to discuss options for online proctoring for quizzes and/or exams. Note: online proctoring will require to have a strong and stable internet connection, and a computer with video camera and audio enabled for the entire duration of the proctored quiz/exam.

7 Materials and resources

Content

Course topics overview:

1. Kinematics
2. Dynamics
3. Work and Energy
4. Conservation of Energy
5. Linear Momentum and collisions
6. Rigid Bodies
7. Angular momentum and static equilibrium
8. Harmonic Oscillator
9. Waves

Canvas

All course materials will be posted on the PHYS 2210 Canvas site https://utah.instructure.com/courses/712262 Make sure to be comfortable and familiar to navigate Canvas and with the "Quick Links" showed on the course Homepage.. Here are a couple of Canvas Guides for Students I encourage you to visit:

- Student Canvas Guide-short
- Student Canvas Guide-extensive

Class announcements will be sent through the Canvas server, and individual email communication with you will also happen through Canvas. **Therefore, it is extremely important that you receive your Canvas notifications and emails at your preferred email address.** To manage your preferred email on Canvas, go on Canvas under *Account* → *Settings*, at the top right of the screen edit *Email Addresses*. In addition, it is important that you received the Canvas Course Annoucements as soon as they are posted, these will often contain timely information; to edit your Notification settings, go on Canvas under *Account* → *Notifications*, and select "Notify me right away" for Announcements.

Textbook, Inclusive Access and MasteringPhysics

The book adopted for this course is *Physics for Scientists and Engineers: A Strategic Approach with Modern Physics* with MasteringPhysics, Fourth Edition, by Randall D. Knight. The electronic version of the textbook and associated resources and access to MasteringPhysics are available to you as part of the *Inclusive Access Program*. The *Inclusive Access Program* delivers all required course material as part of your tuition or fees. **If you are enrolled in this course, you do not need to buy course material as they will be provided to you starting the first day of class**. You will get the required resources and access to the book directly through the Canvas site. A paper copy of the book is not necessary, but if you'd like one, you could find it at the Campus Book store, or you can order an "unbound" copy through the MasteringPhysics web interface ($44.97, free shipping).
Homework submission will happen through MasteringPhysics as well as access to LearningCatalytics, therefore you will need to make sure to have a MasteringPhysics account set up starting the first day of class. The instructions on how to access MasteringPhysics are posted on the Canvas site.

In-class Response Tools: Learning Catalytics and Desmos

We will use Learning Catalytics to capture your input in class. Learning Catalytics is an interactive student response tool that you will be able to access online through your MasteringPhysics account (the same account that gives you access to the textbook and homework platform, see more details under Textbook). Information on how to access and use Learning Catalytics will be given the first week of class (you will NOT need to create an account). You will never be penalized for answering an in-class question incorrectly, but you are encouraged to try your best to answer, your responses will help the instructor tailor the class to your needs.

We will also use Desmos for some in-class activities. **By August 25 please make sure to create a free Desmos account** (simply choosing a username and email) to be ready to use Desmos during class starting August 25. To create a student account go on the homepage Desmos and click on the top right under "Sign Up."

Lecture videos, slides and notes

A draft of slides and lecture notes will be posted on Canvas everyday before class time. A finalized version of slides and notes will be posted after class. Lecture recording will be also available by the end of the day.

Discussions Boards

We will be using the Canvas Discussions Boards in this course, an online platform embedded on Canvas for everyone to post questions to the teaching team and classmates. There will be different Discussion Boards based on the topic and purpose. Post questions on the Discussions Board to get quick responses from your instructor, TAs, LAs, and classmates. In this way, everyone can learn from your questions and you will be answered more quickly. I also encourage you to post answers to help your fellow classmates.

Group work

Group work and collaboration are essential tools to succeed in almost any career (research teams, firefighting personnel, nursing teams, committees, construction teams, etc.) and they will be fundamental and invaluable tools for your learning of physics in this class. That is why one of the learning goals of this course is to learn to work effectively with your classmates. Learning to work effectively with a variety of people will prepare you to work with your colleagues and collaborators at your work place, and will enhance and deepen your understanding of physics. The best discoveries in science very often arise from the group work and collaboration of several people. By discussing ideas, posing questions, listening to other people's way of thinking, we each grow intellectually and can overcome struggles that seem daunting individually. I encourage you to start to hone your team work skills in this course. Specifically, I encourage you to collaborate, talk, discuss, make your classmates your best study-partners, bug them with questions, build ideas together. There will be group activities and group work several times throughout the course and working effectively in a group will be fundamental to your success in this class. The course is designed to encourage the collaboration with your classmates inside and outside the class. You will work in groups during the *lectures* when you will be asked to discuss and work with your classmates. In the *discussion sections* you will work on problem solving in groups of 3-4 classmates, groups will be changed for every discussion section. You will also work in groups for some of the class assignments, such as *groups quizzes* and *group exams*. *Study-halls*, I hope, will enable you to meet and work together with colleagues in the class; the Discussion Boards on Canvas will be another place where interact with your peers online. You can set up your own study-groups, or come together to study-hall. There will be a lot to understand and discover in this class, and while it can sometimes be rewarding to struggle on your own, often it can be fun to struggle together in a group. **I am NOT grading on a curve in this class, so your classmates are friends, collaborators, and team mates, not competitors.**

8 Communication

Communication and email

You will be responsible for any information contained in **Canvas Announcements, individual emails sent to your Canvas email, as well as information announced in class**. Please keep in mind that **it is also your responsibility to regularly check your Umail** (make sure you set up forwarding if you do not check it regularly), your Umail is the only email contact we have access to as instructors, and the only way for us to communicate privately with you. There will be occasions during the semester that we may need to reach out to you individually (e.g. regarding a grade or missing assignment) and it is in your best interest to respond promptly.

Feel free to contact me by email for questions at claudia.degrandi@utah.edu, I will do my best to answer emails promptly. I would like to encourage you to email me only if it is something personal that requires individual attention, **if instead you have questions about logistics of the class, course material and assignments, and anything else your classmates may wonder as well, please post a question on the appropriate Discussion Board instead.** This way the information is shared quickly to the entire class, and each of you can benefit from seeing other classmates' questions. There is more than three hundreds of you in this course, so the Discussions Boards will be a faster channel for communication for everyone. Therefore, even if you do not post questions yourself, **make sure to check the Discussions Boards regularly** as you may find some helpful information (for instance a typo in the homework, some helpful discussion to prepare for the quiz, etc.).

I will always do my best to ensure the communication relevant to the course is clear and transparent, **it is your responsibility as well to keep yourself updated by regularly checking**: the announcements on Canvas, your default email address on Canvas, your Umail, the posts on the Discussions Boards, and pay attention to the announcements given in class and Discussion Section.

Email Etiquette: How to Email your Professor

When emailing your Instructor and Teaching Team keep a professional tone. For example:

- use a descriptive subject line
- avoid "Hey" and other colloquial language
- always use your professors' proper title: Dr. or Prof.
- sign your message with your name and return e-mail address.

Please consult this page for tips on how to write appropriate professional emails.

9 Course work

Pre-Class Assignments

The night before each lecture there will be a Pre-class Assignment due at midnight, therefore there will be two Pre-Class assignments due every week on Sunday at midnight and on Tuesday at midnight. The purpose of the Pre-Class Assignment is to introduce you to new class concepts and material prior to the lecture, and gather feedback from you on which topics you find most difficult. Pre-class assignments may include:

- watching some short video lectures and/or reading related course material;
- completing a quiz or survey;
- posting on a Canvas Discussion Board based on given prompts.

Your Discussion Board post associated with the Pre-Class Assignment will be read by the instructor and Teaching Team prior to the lecture; this way the lecture can be better tailored to address your questions and interests. This is why the Pre-Class assignments are due the night before the lecture, to give time to the Teaching Team to read carefully through all students' posts prior to class.
The Pre-class Assignment due on Sunday will be available since the prior Thursday morning; the Pre-Class Assignment due Tuesday, will be available on Monday after class. I encourage you to do these assignments early as soon as they are posted.

Dropped Pre-Class Assignments Pre-Class Assignment contribute 10% to your final grade. There will be about 26 Pre-Class Assignments throughout the entire semester, some will count more points than others. You will be allowed to miss a few of these without affecting your final course grade, *your lowest six Pre-Class Assignment scores (or equivalent points) will be dropped* in calculating your cumulative course grade. **Effectively, you are automatically excused if you miss up to six Pre-Class Assignments**.

The first Pre-Class Assignment will be available after the first class on Monday August 23 and due on Tuesday, August 24 at midnight.

Discussion Sections

Attendance and active participation in Discussion Sections is **required**. During Discussion Section you will work on problems and exercises meant to help you practice with concepts and prepare for homework and exams. Every couple of weeks on Monday/Tuesday there will be a Quiz administered during Discussion Section (see next section on Quizzes). In Discussion Section you can choose to either work individually or join a group of 3-4 classmates. Groups will be changed every discussion section. You can change your preference to work individually or in group every Discussion Section. We encourage you to join a group regularly, or at least once a week, but it will be understood if you prefer to work individually.
In order to get full credit for attending a Discussion Section, you need to:

- Come on time and stay until the end of the section
- Work and participate actively on the activities assigned by your TA
- Submit on Canvas the required work assigned by your TA **at the end of your Section or at the latest by midnight of the day of the Discussion Section**.

If you fail to meet one or more of the criteria above, you will be given partial or no credit.

Dropped Discussion Sections Participation in Discussion Sections contribute 12% to your final grade. There will be about 26 Discussion Section meetings throughout the entire semester, *your lowest five Discussion Section scores will be dropped* in calculating your cumulative course grade. **Effectively, you are automatically excused if you miss up to five Discussion Sections.**

The first Discussion Section will be on Monday, August 23 if you are enrolled in Section 012, 022, or Tuesday, August 24 if you are enrolled in Section 013, 014, 015, 023, 024, 025.

Quizzes

Roughly every two weeks there will be a Quiz on the material of the previous two weeks. The Quiz will be administered and proctored during Discussion Section on Monday/Tuesday (depending on the section in which you are enrolled) with the following schedule and topics:

- Quiz 1 [Week 3-September 8/9 Wed/Thur for this time only]: Kinematics
- Quiz 2 [Week 6- September 27/28]; Kinematics and Dynamics
- Quiz 3 [Week 9- October 25/26]: Energy and Momentum
- Quiz 4 [Week 11- November 8/9]: Rigid bodies
- Quiz 5 [Week 15- December 6/7]: Oscillations and Waves

Format of the Quiz The quiz will be a multiple-choice quiz on Canvas. You will have two attempts with a time limit of about 20 minutes for each attempt. Your final score will be the average of your two attempts. The first attempt will be done individually at the beginning of discussion section; for the second attempt you will be given the option of joining a group and resubmit while discussing with your classmates.

Dropped Quiz Quizzes contribute 12% to your final grade. Of the 5 total quizzes administered this semester, *your lowest quiz score will be dropped* in calculating your cumulative course grade. **Effectively, you are automatically excused if you miss one Quiz.** There will be no make-up quiz option. If you have a non negotiable event or condition that will prevent you from taking the quiz, please reach out to the instructor at least 24 hours ahead of time.

Homework

There will be about 12 problem sets, assigned weekly and **due Thursdays at midnight**. The purpose of the homework is to review topics covered during one week of class, to get deeply involved in thinking about the material, and ultimately to prepare for the exams. Homework problems might, at times, walk you through a situation or concept not covered in lecture. In short, the homework is a an excellent venue for checking whether you truly understand the material.

The homework also is a good way of getting used to **clear written communication. Make sure the steps of your solution can be followed by another reader.** Even if your logic is sound, if the steps and reasoning are not written down and clearly communicated to the reader your solution will be incorrect. Remember that the emphasis is on the logical process and analytic reasoning you do in order to solve problems, so the final line of the solution is not the basis for judging an answer to be correct or incorrect.

You are encouraged to discuss the problems with your classmates and teaching staff, especially during study-hall. However, the solutions you submit must be your own and represent how you understand the problem. **Students caught cheating will receive no credit for the homework, and will be sent on to the University Disciplinary Committee for further action**.

Homework submission and Solutions

Homework sets are assigned on Fridays and posted on the course website. They are due the following Thursday at midnight. In general, the homework will consist of two parts:

1. **Part 1: on MasteringPhysics**. Problems and questions to be worked out and submitted on MasteringPhysics. You will have multiple attempts, hints available, and immediate feedback on your answers.
2. **Part 2: on Gradescope**. A few additional problems posted on Canvas for which you will write and submit a careful solution that shows all your steps. Make sure the steps of your solution can be followed by another reader. You will turn in Part 2 **online on Gradescope as a single pdf attachment**. You will find all the details on the format requirement and submission of your homework on the Canvas page Homework Format and Submission.

Late homework submission will be penalized according to the Late Submission Policy discussed below.
Homework grading

- Problems in Part 1 on MasteringPhysics will be automatically graded.

- Problems in Part 2 on Gradescope will be graded by the TAs. You must do all assigned problems. Of these, **only a portion of the homework will be graded**, selected after the homework has been handed in. The reason for this procedure is to free up TAs' time, so that they can be available to staff study-hall and hold office hours, which is a more useful way to employ their time than grading alone.

Solutions to the entire homework set will be always posted, and it will be your responsibility to check the solutions to all problems, not just the ones that were graded, and consult with the teaching staff for any question.

Dropped problem sets Homework contributes 22% to your final grade. Of the 12 problem sets assigned this semester, *your lowest two problem sets score will be dropped* in calculating your cumulative course grade.

A warm-up homework assignment will be due Thursday, August 26 at midnight. The first full homework set will be due on Thursday, September 2.

Dynamics Study-Modules

There will be 10 Dynamics Study-Modules to complete on MasteringPhysics throughout the semester. These are great tools to help you review conceptually the topics of the class. They are adaptive multiple-choice quizzes of about 25 questions which you can take as many times you need in order to master all concepts. They will be assigned roughly every week and due on Friday at midnight. You are encouraged to complete these Modules sooner rather than later to help you prepare for Quizzes and Exams.

Dropped Dynamic Study-Modules Dynamic Study-Modules contribute 10% of your final grade. Of the 10 assigned this semester, *your lowest score will be dropped* in calculating your cumulative course grade.

Surveys and additional assignments

During the course of the semester, you will be asked to submit a few surveys and other assignments. These assignments will never be graded for correctness, but simply by being completed and submitted. These assignments will contribute 2% to your final course grade.

Late Submissions

Almost all assignments (Pre-Class Assignments, Discussion Posts, Homework, Survey, etc.) will be subjected to the following Late Penalty policy:

- A 5% of total points possible in the assignment will be deducted **per each hour** the submission is late. Minutes will be rounded to the next integer hour. For instance, if the homework is due at 11:59pm and you submit at 12:02am, you will be deducted 5% of the total homework points, if you submit 4 hours late, you will receive a 20% deduction (in this case for example, if the homework is out of 20 points and you are awarded full points, your homework grade will be 16 instead of 20).
- Therefore, for a submission 20 hours after the deadline, you will be deducted 100% of the total point, and so effectively you will receive no credit for your submission.

Exception: there will be no credit for late submission of the Dynamic Study-Modules. This is because of their completion-by-mastery structure they need to be completed before the set deadline (MasteringPhysics is not able to grant partial credit for late submission in this case).

Excuses

As described above, for each assignment category some of the lowest scores will be dropped from the calculation of your final course grade (in particular 6 Pre-class Assignments, 5 Discussion Sections, 1 Quiz, 2 Homework sets, 1 Dynamic Study Module). These dropped scores are intended as **Automatic Excuses for everyone**, that means you'll have them without asking for it. It is understood that you may have some days where you will have to miss an assignment or class, you may be sick, you may have some conflict, etc. This can happen to everyone. As long as this happens only a few times throughout the semester, you are automatically excused and your grade will not be affected.

Additional excuses may be provided if you find yourself in a situation for which you can prove you have already used up all the already allotted excuses due to an exceptional circumstance out of your control (for instance for an extended medical leave). In those cases please reach out to the instructor to discuss possible accommodations.

10 Exams

All exams and quizzes will be administered and proctored in person, but online proctoring accommodations may be provided with the instructor permission. Please email your instructor within the two first week of classes (by September 3rd at the latest) to discuss options for online proctoring for quizzes and/or exams. Note: online proctoring will require to have a strong and stable internet connection, and a computer with video camera and audio enabled for the entire duration of the proctored quiz/exam.

Midterm Exams

There will be two midterm exams held during class. Midterm exams will occur on the following dates:

- **Midterm 1: Wednesday, October 6** (with Group Resubmission in Discussion Section on Wed October 6/Thur October 7)
- **Midterm 2: Wednesday, November 17** (with Group Resubmission in Discussion Section on Wed November 17/Thur November 18)

Each midterm exam contributes 10% to your final course grade. The exam will consist of two parts:

1. *First submission*: proctored during class time on Wednesday.
2. *Resubmission*: optional second attempt that may enable to improve your grade. The resubmission will be due at midnight of the day after the exam (Thursday, replacing the usual Homework submission, there will be no Homework due the week of exams). The resubmission can be completed either individually or as a group. Students willing to join a group for the resubmission should attend the Discussion Section on the Wednesday/Thursday after the exam to work with classmates.

Your exam grade will be calculated as one of the following, whichever is higher:

- 80% from your first submission and 20% from your resubmission (either individual or group);
- 100% from the first submission.

In most cases the resubmission score is higher than the first submission, so everyone would benefit from the resubmission part. In the instance that your in-class individual score is higher than the second resubmitted one, then your grade will be 100% based on your first submission. Therefore, nobody can be penalized by the resubmission component, while most likely you will benefit from it. If you are happy/confident with your first submission you do NOT need to resubmit.

Make-up exams will only be offered in the following cases (a) absence due to a University sponsored activity or to military or jury duty, and (b) serious medical emergencies. In any case the student must provide complete documentation. In the case of exception (a) the request for a make-up exam must be filed with Professor De Grandi **at least three weeks in advance** of the anticipated absence. **Please note that all exam dates and times have already been determined: mark your calendars now and resolve any conflicts as soon as possible!**

Final Exam

The final exam for this course is scheduled for Wednesday **December 15th, 3:30-5:30pm** and contributes 12% to your final course grade. The final exam will be cumulative and therefore it will cover the material of the entire semester.

Homework and Exam Regrading Request
If you feel an error was made in grading part of your homework or exam, you may request a regrading of problems. This means that your grade on the problem could be raised or lowered; thus, it is highly recommended that you only use this option if there is a clear and egregious error in the grading. Regrade Requests can be submitted on Gradescope within a week from when the grades are posted.

11 Grading

Checking your Course Grades

It is the **student's responsibility to ensure the accuracy of all recorded homework, quizzes, online assignments, and exam grades.** Also you should keep as record all your graded assignments. If you see any error in your grades on Canvas, reach out to the instructor as soon as possible, or at the latest **within two weeks from when the assignment grade was posted.**

How I determine your final grade

There are two grading schemes to calculate the final course grade. I will use whichever is in your favor. Exams constitute 32% of your overall course grade. This portion of your cumulative grade can come from Midterm 1, Midterm 2 and the Final exam (10% +10% +12%) OR entirely from your final exam score (32%), whichever is higher.

Pre-Class Assignments	10%
Homework	22%
Discussion Sections	12%
Quizzes	12%
Dynamic Study Modules	10%
Surveys	2%
Midterm 1	10%
Midterm 2	10%
Final Exam	12%

OR

Pre-Class Assignments	10%
Homework	22%
Discussion Sections	12%
Quizzes	12%
Dynamic Study Modules	10%
Surveys	2%
Final Exam	32%

The rationale for these two schemes is that I believe that if you have mastered the material at the end of the course and your performance on the cumulative final exam demonstrates this, you should not be held back by a rough start earlier in the semester.

Grade boundaries

Your final letter grade will be determined from your total course grade percentage (calculated as described above) and according to the following grade boundaries:

Score in %	Grade
93-100	A
89-93	A-
85-89	B+
80-85	B
75-80	B-
70-75	C+
65-70	C
60-65	C-
<60	D,F

12 Academic Code of Conduct

Academic Integrity

While I encourage students to work together in groups, either in preparation for the weekly homework or for the exams, each student must ensure a thorough understanding of the material and the problems solved. After your group study, you should always write up your work individually. Being able to rework your group's effort will show you whether you really understood everything.

If you are expected to collaborate on a group quiz or group exam it will be clearly stated. All individual quizzes, and the individual components of midterm exams and the final exam must be done entirely on your own. Sharing of information through any means (notes, internet, talking, texting, copying, etc.) will be considered a case of academic dishonesty.

Violations of the Student Code of Conduct erode the equitable learning environment that we strive for in this course. Therefore, at the beginning of the semester I will require all students in this course to agree to the academic integrity statement below.

Code of Conduct

All work submitted as part of your enrollment in this course should be your own work and you must follow all the rules associated with the assignment. Incidents of academic misconduct (including cheating, plagiarizing, research misconduct, misrepresenting one's work, and/or inappropriately collaborating on an assignment) will be dealt with in accordance with the Student Code (Policy 6-400, Section V). Instances of academic

misconduct could result in a failing grade for the course; probation, suspension, or dismissal from a program; suspension or dismissal from the university; or revocation of a degree or certificate. Inappropriate behavior includes, for example, submitting assignment problems to online tutoring resources or searching for solutions on such websites and submitting the result as your own work.

All study materials in this course are considered intellectual property of the instructor and the University of Utah (this includes lecture slides, problem sets, exams, answer keys etc.). Unauthorized uploading or distribution of the aforementioned materials to any website, either during or after the semester, is prohibited and may be addressed both as a violation of the behavioral standards as well and an act of academic misconduct. The Department will actively monitor websites for unauthorized distribution and refer all instances of the violation to VP for Student affairs and the College of Science Academic Affairs Committee for investigation. You need written permission from the instructor permitting you to upload the material.

Events of academic dishonesty will be dealt with in the following way:

- First Offense: Student will receive a zero on exam or assignment.
- Second Offense: Students will receive a failing grade in the course.
- Particularly egregious attempts at cheating will result in a referral to the advocacy system and a permanent mark on your record.

Your are encouraged to review the Student Code for the University of Utah:
https://regulations.utah.edu/academics/6-400.php.

13 Additional Policies and Resources

COVID-19 Considerations

Follow the University's guidelines: 1) get Vaccinated; 2) if you are not yet vaccinated, get weekly asymptomatic coronavirus tests; 3) follow CDC guidelines regarding face masks, which now call for everyone to wear face masks indoors. Please find information about vaccination, testing, and latest Covid-19 Response at COVID-19 CENTRAL @TheU.
Students must self-report if they test positive for COVID-19 via https://coronavirus.utah.edu/.

The Americans with Disabilities Act

The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the Center for Disability and Access, 162 Olpin Union Building, (801) 581-5020. CDA will work with you and the instructor to make arrangements for accommodations. You are encouraged to come and talk to me about your necessary accommodations within the first two weeks of the semester.

Campus Safety

The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit safeu.utah.edu

Addressing Sexual Misconduct

Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801- 581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677 (COPS).
I will listen and believe you if someone is threatening you, and help you connect with the appropriate help and resources. **As University Employees, myself and all the Teaching Assistants are mandatory reporters.**

Violence Prevention

I am committed to make sure all students in my class have the support they need if they are experiencing violence, including but not limited to domestic violence, interpersonal violence, and stalking. If you are experiencing violence I encourage you to tell someone and seek help from the resources listed below.

Campus Resources	
Safe U	safeu.utah.edu
Advocacy/Mental Health	
Contact a Victim Advocate	advocate@sa.utah.edu
University Police	801-585-2677

Area Resources	
Utah's Domestic Violence Coalition	www.udvc.org
YWCA of Utah	www.ywcautah.org
Utah Coalition Against Sexual Assault	www.ucasa.org
Rape Recovery Center Crisis Line	901-467-7273
Love is Respect	www.loveisrespect.org

Student Names and Personal Pronouns Statement

Canvas allows students to change the name that is displayed and allows them to add their pronouns to their Canvas name. This is possible on Zoom as well through the "Rename" tool. I will honor you by referring to you with the name and pronoun that feels best for you. Please advise me of any name or pronoun changes (and update CIS, Canvas and Zoom) so that I can help create a learning environment in which you, your name, and your pronoun will be respected. If you need assistance getting your preferred name on your uID card, please visit the LGBT Resource Center.

Office of the Dean of Students

The Office of the Dean of Students is dedicated to being a resource to students through support, advocacy, involvement, and accountability. It serves as a support for students facing challenges to their success as students, and assists with the interpretation of University policy and regulations. Please consider reaching out to the Office of Dean of Students for any questions, issues and concerns. 200 South Central Campus Dr., Suite 270. Monday-Friday 8 am-5 pm.

University Counseling Center

The University Counseling Center (UCC) provides developmental, preventive, and therapeutic services and programs that promote the intellectual, emotional, cultural, and social development of University of Utah students. They advocate a philosophy of acceptance, compassion, and support for those they serve, as well as for each other. They aspire to respect cultural, individual and role differences as they continually work toward creating a safe and affirming climate for individuals of all ages, cultures, ethnicities, genders, gender identities, languages, mental and physical abilities, national origins, races, religions, sexual orientations, sizes and socioeconomic statuses.

Wellness Statement

Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student's ability to succeed and thrive at the University of Utah. For helpful resources, contact the Center for Student Wellness; 801-581-7776.

Learners of English as an Additional/Second Language

If you are an English language learner, please be aware of several resources on campus that will support you with your language and writing development. These resources include: the Writing Center; the Writing Program; and the English Language Institute. Please let me know if there is any additional support you would like to discuss for this class.

Veterans Center

If you are a student veteran, the University of Utah has a Veterans Support Center located in Room 161 in the Olpin Union Building. Please visit their website for more information about what support they offer, a list of ongoing events and links to outside resources. Please also let me know if you need any additional support in this class for any reason.

Undocumented Student Support

Immigration is a complex phenomenon with broad impact— those who are directly affected by it, as well as those who are indirectly affected by their relationships with family members, friends, and loved ones. If your immigration status presents obstacles to engaging in specific activities or fulfilling specific course criteria, confidential arrangements may be requested from the Dream Center. Arrangements with the Dream Center will not jeopardize your student status, your financial aid, or any other part of your residence. The Dream Center offers a wide range of resources to support undocumented students (with and without DACA) as well as students from mixed-status families. To learn more, please contact the Dream Center at 801.213.3697 or visit https://dream.utah.edu/.

Too Many Resources! Where to start?

Reach out to the Student Success Advocates for assistance navigating resources and mentoring! Watch this short video on how Student Success Advocates can help you! The mission of Student Success Advocates (https://ssa.utah.edu/) is to support students in making the most of their University of Utah experience. They can assist with mentoring, resources, etc. In addition, any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact a Student Success Advocate for support.

Suggestions and other arrangements

Your suggestions are always encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups. In addition, if any of our class meetings conflict with your religious events, please let me know so that we can make arrangements for you.