

# Physics 2010 Summer of 2021 (Online Synchronous) Syllabus

**Instructor:** Atsushi Yoshida, [ay9a@virginia.edu](mailto:ay9a@virginia.edu)

**Lectures:** Monday - Friday, lecture 8:00 – 11:00 on Zoom

**Office Hours/Discussion Section:** Monday - Friday, 11:15 – 13:15 on Zoom

**Teaching Assistants:** Mohit Vir Srivastav, [mvs2dq@virginia.edu](mailto:mvs2dq@virginia.edu)

**Office Hours:** TBA

**Text:** Walker, James S, *Physics*, 5<sup>th</sup> Edition (with MasteringPhysics), Pearson

**Course Requirements Summary:** Students are expected to attend all lectures on Zoom 8:00-10:45, and take exams (2 midterms and the the final; see the dates in the schedule attached below) and daily quizzes (10:45-11:00). Physics 2010 and 2020 are intensive courses; students should not register for concurrent courses (other than the accompanying lab courses Physics 2030/2040). No allowances will be granted for conflicts with other courses or extracurricular activities (e.g. summer jobs). If a student is ill and misses quizzes, mid-term exams, or the final exam, the student must contact the instructor *before* the missing events, unless there is an unavoidable reason not being able to do so. Students are expected to participate positively in the course. **The highest standards of the University Honor System are expected and will be enforced:** the instructor will report any and all suspected cheating incidents to Honor Committee without hesitation. The instructor strongly encourages his students to do the same in defense of the traditional values of the higher learning.

**Course Grades:** The graded work for the course is as follows:

- i) Homework via Mastering Physics (5%);
- ii) Quiz Prep Video Assignments (5%);
- iii) Daily Quizzes (10%) [10:45 to 11:00 (15 quizzes)];
- iv) Two Midterm Exams (20% each) [8:00 to 9:00];
- v) Final Exam (40%)[8:00 to 10:00].

The instructor assigns grades for the course. The mean score for the course will be assigned a grade of B or B-. Average GPA of the course is 3.0 (within two significant figures). For reference, the distribution of the final grades among the students who completed the final exam in the five summers 2015-2019 is as follows:

A+	A	A-	B+	B	B-	C+	C	C-	D+	D
3%	8%	7%	11%	28%	31%	5%	4%	2%	0%	1%

Note: this is a distribution of "large number" of students from which the distribution of this summer (a distribution of relatively smaller number) may significantly differ.

No further discussion on the grade distribution is available.

**Lectures:** Lectures will be held on Zoom from 8:00am. Students are expected to attend the lectures live and actively participate in the course. For this reason, the instructor strongly encourages students to participate in the Zoom sessions with their monitors on. Questions and comments related to the lecture are always welcome exactly as in the regular in-person classes. The lecture will be followed by Daily Quiz at 10:45. (The quiz starts from the second day; the lecture lasts till 11:00 on the first day as an exception.) For the details of the quiz, see below.

*First lecture will begin from Chapter 2.* Students are requested to read Chapter 1 on their own before the first lecture day. (Chapter 1 reviews the fundamentals of math that is used in physics, such as units, units conversions, scientific notations, significant figures, dimensions etc.; the main physics begins from Chapter 2.) For the lecture schedule, see the table at the end of this instruction.

The lectures will be recorded and posted on Collab/Media Gallery every day after each lecture. The lecture videos are for the reviewing purpose only: it is not meant to substitute the actual attending of the live lectures between 8:00-10:45: the contents of the daily quiz after the lecture may be directly related to the contents of the lecture. The student may download the lectures to her computers/storage devices from Collab, if she need to refer to them during her study offline and/or the quizzes/exams.

**Office Hours/Discussion Sections (OH/DS):** Instructor and TA will have daily office hours/Discussion Sections (OH/DS) on Zoom linked from Collab/Online Meetings, as scheduled above. Students are free to check-in and check-out at any time during any of the office hours.

In OH/DS the instructor/TA will accept questions from students and expand on the topics if found desirable. Though OH/DS are not mandatory, they are integral parts of this course together with the lectures. Even if one does not have a specific question of one's own, it is often revelational just listening to the dialogues between the instructor/TA and fellow students. Past experience strongly suggests that consistent active participation in OH/DS is a key factor for succeeding in this course (though certainly it's not a guarantee).

The first part of the instructor's OH/DS (11:15~) will be dedicated to Daily Quiz Discussion of the day and will be recorded and posted on Collab/Media Gallery. The rest of the discussion will not be recorded in order to motivate freewheeling dialogues.

We ask students to attend OH/DS with the monitors on, in order to facilitate the authentic person-to-person communication.

**Assignments:** Assignments (nearly daily) have two parts: (i) MasteringPhysics (MP) associated to the textbook; (ii) Quiz Prep Homework (QP) similar to Quizzes/Exams which are in video format.

**MasteringPhysics (MP):** Problem numbers for the daily MasteringPhysics (MP) assignment are given in the schedule below. (See separate documents for how to enroll in MP.) Due date for each assignment is given in Assignment section of MP. The 100% of the credit is given to the MP portion of the assignment if more than 80% of the raw grades have been accumulated at the end of the course.

Daily MasteringPhysics assignment problems are the absolute minimum that all students should work out in order to consolidate the knowledge acquired in the lectures. Majority of the students will find it necessary to practice beyond this assignment in order to (i) grasp the concepts and techniques fully and (ii) feel equipped to successfully demonstrate their knowledge in the quizzes and exams. For that purpose, in this course students have the access in MP to all the “Conceptual Questions” and “Problems and Conceptual Exercises” at the end of every chapter *and* their solutions, plus nearly inexhaustible amount of additional MP special exercises such as “Alternative Exercises”, tutorials, short video exercises, “Prelecture Conceptual Questions”, all with answers! They are found in the Assignment section (after all the listed Homework) in MP with the headlines “**More Practice for Chapter X**” The instructor encourages the student to explore them in the early part of the course to figure how best to incorporate them in her study plans.

**Quiz Prep Homework (QP):** Quiz Prep Homework (QP) will be daily posted in Collab (“Assignment” section) at 15:00 and due on 23:59. The 100% of the credit is given to the QP portion of the assignments by simply turning in the answers to the questions irrespective to the actual points the student receives by the correctness of her answers. This is because the main purpose of QP is to prepare the students for the particular format of the Daily Quiz. *In order to get the full benefit of QP, students are strongly advised to follow the steps exactly emulating the Daily Quiz procedures:*

- (i) Set a timer to 14 minutes (NOT 15 minutes).
- (ii) Start the timer and open the video.
- (iii) Full focus on the assignment in the next 14 minutes until the timer rings.
- (iv) At the ring of the timer, complete your final answers and submit promptly.

The answers will be posted in Collab after the deadline for each QP.

Please read the separate instruction on further details of QP. Students are also strongly advised to try out Quiz Prep #0 following the instruction therein which will be due Sunday June 20 (Day 0).

(Note: Question 1 of QP is a simple question from the topic of the *next day's* lecture - you may simply use your educated guess or preview the chapter in advance to answer this question - and Question 2 of QP is a more substantial question from the day's lecture. The constituents of QP, therefore, are slightly different from those of the actual Daily Quiz: In Daily Quiz, Question 1 will be a simple question from the lecture preceding the quiz or previous day's lecture, and Question 2 will be a more substantial question from the topics of two-lecture days before or earlier.)

**Daily Quizzes:** Starting from Day 2, there will be a quiz every day except for Exam days (total of 15 quizzes). The quiz will take place on Collab (“Assignments” section) in a video format (just like QP) at 10:45am for 15 minutes. The student must submit her answer in Collab before 11:00:00.000am (this is eleven o’clock, zero minute, zero second: even a milli-second later than this time will be penalized as late submission as per the internal computer clock); multiple submission is not allowed. Two instances of absence from Daily Quiz will be permitted (with or without excuses) e.g. sickness, hang-over, family duties, internet outages. If the student is absent in less than two occasions, the lowest grade (one absence) or the lowest two grades (no absence) will be dropped from her final quiz grades average.

In Daily Quiz, two questions will be given. Question 1 will be a simple question from the lecture preceding the quiz or from the previous day's lecture, and Question 2 will be a more substantial question from the topic of two lecture-days or before. The details of the quiz procedures will be given in Daily Quiz Instruction document.

**What can students use during the Daily Quiz?:** All quizzes and exams are “open-book”, which includes lecture videos and e-textbook. Any hard-copy (i.e. printed on paper) textbooks and students’ notebooks are also allowed. Stand-alone calculators are also allowed. **What is NOT allowed:** help from anyone nearby; help that requires internet connection including commercial online help (e.g. Chegg.com). (If in doubt, please ask the instructor in advance, rather than jeopardizing the whole academic career by a single poor decision.)

**Why is there quiz every day?:** Physics 2010 and 2020 during summer are intense accelerating courses in which every day one chapter (of more than 30 pages in average) is processed. Unlike in the regular semesters, there is no off-day between consecutive lectures. Cumulative nature of the physics knowledge means that taking one day off and the student will risk buried deeper every day in an avalanche of new knowledge. Taking a quiz every day is a preventive measure to avoid this disaster.

**Why is the quiz in video format?:** Since the rise of the Covid-19-driven online teaching and examination in the spring semester of 2020, sudden surge of the number of cheating incidents was noted, not just in UVA, but nationwide (and likely worldwide). One of the most popular types of cheating is for students to send the exams/quizzes to a commercial company such as Chegg.com online which returns the “expert” answers to the students' questions in a short time, potentially before the end of the exam. Main reasons for the popularity is no doubt the ease with which students can send the exam/quiz document (e.g. pdf file, screenshot) with the click of a mouse over internet. Changing the exams and quizzes to video format is an attempt to counter this ease. Of course, simply changing the exams/quizzes to video format will not prevent a hard-core veteran honor offender from cheating, but it is hoped that a potential temptation for ordinary honest students to cheat in a moment's poor decision may be damped in this format.

**Midterm Exams:** The two midterm exams take place on the designated dates (see Schedule) from 8:00 am for one-hour. Each midterm has two parts: Part 1 (8:00-8:30) and Part 2 (8:30-9:00) and will take place on Collab (“Assignments” section) in a video format just like Daily Quiz. The rules of the exam are exactly the same as Daily Quiz. More details will be discussed as the exam dates approach.

**Final Exam:** The final exam takes place on the designated date (see Schedule) from 8:00am till 10:00am in four parts: Part 1 (8:00-8:30), Part 2 (8:30-9:00), Part 3 (9:00-8:30) and Part 4 (9:30-10:00), and will take place on Collab (“Assignments” section) in a video format just like Daily Quiz and midterm exams. The rules of the final exam are exactly the same as Daily Quiz and the midterm exams. More details will be discussed as the exam date approaches.

**Why are the exams separated in 30-min parts?:** Commercial internet services such as Chegg.com (see the subsection “Why is the quiz in video format?” above) return students questions in a hurry. Dividing an exam into small parts is another attempt to discourage potential honor offense.

**Grade Disputes:** If students dispute the grading of their work, then they must follow this procedure. The students must submit the original work (quiz, mid-term exam) to the *instructor* (not TA) within two class-days of that work’s return to the students. The work must be accompanied by a written appeal of no more than 300 words. Students may appeal only on the grounds that the work was incorrectly graded. Students may not appeal that point distribution should be different, or on any other grounds. The original work forms the only basis for the appeal. Appeals that attempt to argue ‘what I meant to say is . . .’ will be promptly discarded. Final exams will be reviewed by the instructor before grades are assigned and will not be subject to appeal.

**Cheating:** All quizzes and exams are open-book, which includes lecture videos and e-textbook. Any hard-copy (i.e. printed on paper) textbooks and students’ notebooks are also allowed. Stand-alone calculators are also allowed. **What is NOT allowed:** help from anyone nearby; help that requires internet connection including commercial online help (e.g. Chegg.com). *Needless to say, discussion in any form among students during exams/quizzes is an honor offense.* If in doubt, please ask the instructor in advance, rather than jeopardizing the whole academic career by a single poor decision.)

Any misconduct (or suspicion of misconduct) will be reported to Honor Committee. This includes any discovery of misconducts *after* the posting of the final grades.

**Special Notes for Online courses:** All quizzes and exams are downloaded and submitted through Internet: it is the student's responsibility to maintain the domestic Internet condition during the quiz/exam. Collab warns the students as follows:

“Turn off cell phones and other network devices such as video game consoles, internet-capable TVs, etc., or set them to **Airplane mode** to reduce network congestion and interference. We also recommend asking others in your household **not** to use devices that will consume internet bandwidth while you are taking a test. **Note:** Some devices, such as video game consoles, may remain connected to the internet in sleep mode and continue to use internet bandwidth even when you don't realize it!”

Collab also suggests: “Avoid having multiple devices connected to the internet during a test.” (See the rest of the warning in <https://uvacollab.screenstepslive.com/s/help/m/students/1/634312-essential-tips-for-taking-online-tests-in-uvacollab>)

**What students need to do before the first lecture:**

- 1) Get hold of the textbook and register in MasteringPhysics.
- 2) Read Chapter 1 of the textbook in advance and understand the content: the first lecture begins from Chapter 2.
- 3) Read all the documents sent via Announcement in Collab
- 4) Turn in Quiz Prep #0 (ungraded) by 11:59pm, June 20 (Sun) to understand how Daily Quiz works.

**For the course schedule, see the next page**

**Schedule:** These assignment problems represent a *minimum* that students should work out. (**Bold face** numbers represent problems that are only available on MasteringPhysics.) Most students will need reinforcement in addition. For this purpose MP includes nearly inexhaustible amount of practice problems in “More Exercise for Chapter X” for each chapter X. Note: Chapter 1 must be read by students prior to the 1<sup>st</sup> day of the lecture. The lecture begins from Chapter 2.

Starting June 22, **Daily Quiz** takes place on every non-Test lecture day at **10:45-11:00**

Date	Chapter (Walker)	MP Assignment Problems
Pre-class	1	5, 14, 15, 20, 27, 38
06/21 M	2	4, 7, 17, 32, 34, 35, 42, 52, 53, 56, 73, 83
06/22 Tu	3	6, 14, 15, 19, 20, 25, 27, 33, 36, 37, 50, 51, 55, 59, 64, 69
06/23 W	4	(Ch 3) 76 ; (Ch.4) 7, 15, 17, 19, 21, 23, 25, 28, 45, 51, 64, 65, 69, 84
06/24 Th	5	1, 12, 16, 23, 28, 34, 42, 44, 49, 54, 69, 72, 77, 78, 82, 85
06/25 F	6 (part 1)	14, 23, 26, 29, 31, 40, 42, 44, 45, 48, 49, 54, 62, 65, 72, 77
06/28 M	6 (part 2)	4, 8, 37, 47, 52, 57, 63, 70, 75, 80, 87, <b>100, 107, 118, 131, 137, 138</b>
06/29 Tu	7	1, 6, 9, 14, 17, 22, 23, 25, 27, 37, 38, 47, 51, 67, 76, <b>101</b>
06/30 W	<b>Test 1: Ch 1-6 (8:00 - 9:00)</b> 8	1, 6, 13, 20, 23, 24, 28, 31, 40, 48, 51, 53, 55, 59, 71, 75
07/01 Th	9	10, 17, 21, 25, 30, 33, 34, 41, 48, 53, 56, 70, 73, 78, 82, 84, 86
07/02 F	(Midpoint Phys 2010) 10	18, 21, 33, 41, 42, 50, 54, 57, 60, 70, 72, 89, 91, 92, 98, 99
07/06 Tu	11	7, 8, 14, 17, 20, 31, 38, 40, 48, 55, 62, 65, 75, 76, 87, <b>109</b>
07/07 W	<b>Test 2: Ch 7-10 (8:00 – 9:00)</b> 12	10, 12, 19, 22, 23, 25, 32, 38, 39, 46, 53, 54, 68, 71, 90, <b>115</b>
07/08 Th	13	7, 12, 14, 26, 27, 29, 31, 35, 38, 51, 54, 57, 66, 77, 89, 91
07/09 F	(Withdrawal Deadline) 14	1, 2, 13, 18, 28, 40, 42, 53, 56, 62, 64, 72, 74, 81, 83, 95, <b>118</b>
07/12 M	15	11, 16, 17, 18, 24, 35, 36, 40, 43, 48, 55, 62, 66, 79, 92, 106, <b>127</b>
07/13 Tu	16	7, 17, 21, 24, 34, 39, 44, 47, 49, 57, 63, 65, 68, 73, 74, 80, 89
07/14 W	17	3, 6, 8, 12, 15, 16, 27, 43, 44, 47, 55, 57, 58, 60, 67, 70, <b>105</b>
07/15 Th	18	3, 7, 11, 18, 21, 23, 24, 25, 26, 30, 36, 39, 51, 59, 67, 71, 85
07/17 Sa	<b>Final Exam 8:00-10:30</b>	

Following sections are omitted in the course: 12.6, 13.7-8, 14.3, 15.9, 17.3