PHYSICS 1101W, (Introductory College Physics I), 4 units

Instructor: Lindsay Glesener
Office: 193 Shepherd Lab

Email:
  • Email your TA (Write ‘1101’ in the subject line.)
  • Email the instructor: glesener@umn.edu (Write ‘1101’ in the subject line.)

Office hours:
  • The TAs hold office hours in Williamson 140 beginning the second week of classes. The schedule will be posted outside room 140.
  • Instructor office hours: 193 Shepherd, Wednesdays 3:45-5:45 pm


CLASS WEBPAGE

URL: https://www.physics.umn.edu/. Select Classes then select Phys 1101W. Log in using your X.500 username and password to see all the materials. Please refer there for official announcements on lectures, lab, homework, quizzes, and the final exam. Solutions to quizzes and suggested homework will be posted. This is the main class website! We won’t be posting everything (or maybe anything) on Moodle.

SUMMARY OF STUDENT TASKS

Attend all lectures, discussion, and lab sections.

Before each lecture:
  • Read the relevant section of the text. The lecture will not cover everything the book does, and you’ll be responsible for knowing the assigned material whether or not it’s covered in lecture.
  • Bring your notes, clicker, and calculator to the lectures.

Before each lab:
  • Read the Introduction, Objectives and Preparation sections of the write-up in the lab manual for the problems assigned for that week. **Turn this in to your TA 24 hours before your class starts.** Your TA will let you know the method for turning these in.
  • Complete any suggested text reading that is given in the Preparation section.
  • Lab reports will be due every 2-3 weeks. Your TA will assign the specific problem.

Ongoing:
  • Complete the suggested homework. If you have questions on homework problems, etc., you can attend the TA office hours (tutoring room). In addition to the assigned TAs for this class, there are tutors available in Williamson at many other times, and any TA in the tutoring room will help you with questions about the topics in this class.

TA OFFICE HOURS:

Office hours held by the 1101 TAs will be included on our web page office hour link. These will be held in
Williamson 140. Williamson 140 is the TA office hour room for all Physics TAs. Each TA, whether they are assigned to our course or other introductory courses, are available for consultation about all introductory courses. Feel free to consult any physics TA holding office hours in that room.

**COURSE PREREQUISITES:**

No prior physics course is assumed, but facility in algebra and basic trigonometry is essential. If you feel rusty you should review and practice. Appendix A in your textbook provides an overview of the tools you will need.

**WORKLOAD:**

This is a demanding course. There is a lot to learn. The course moves at a fast pace. Since each new topic builds on previous work, it is of great importance that you do not fall behind. You should expect and plan for a workload consistent with University policy (three hours per week per credit for a total of twelve hours per week for an average student to receive an average grade).

**TENTATIVE COURSE SCHEDULE (SUBJECT TO CHANGE):**

As the semester progresses, we may adjust the topics covered and the labs so that they stay in sync.

<table>
<thead>
<tr>
<th>Week starting</th>
<th>Week</th>
<th>Chapter</th>
<th>Lab</th>
<th>Lab problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-Jan</td>
<td>1</td>
<td>1</td>
<td>Intro</td>
<td>None</td>
</tr>
<tr>
<td>25-Jan</td>
<td>2</td>
<td>1-2</td>
<td>I</td>
<td>Problem 1</td>
</tr>
<tr>
<td>1-Feb</td>
<td>3</td>
<td>2-3</td>
<td>I</td>
<td>TBA</td>
</tr>
<tr>
<td>8-Feb</td>
<td>4</td>
<td>3 + QUIZ 1</td>
<td>II</td>
<td>TBA</td>
</tr>
<tr>
<td>15-Feb</td>
<td>5</td>
<td>3-4</td>
<td>II</td>
<td>TBA</td>
</tr>
<tr>
<td>22-Feb</td>
<td>6</td>
<td>4-5</td>
<td>III</td>
<td>TBA</td>
</tr>
<tr>
<td>29-Feb</td>
<td>7</td>
<td>5 + QUIZ 2</td>
<td>III</td>
<td>TBA</td>
</tr>
<tr>
<td>7-Mar</td>
<td>8</td>
<td>5-6</td>
<td>III</td>
<td>TBA</td>
</tr>
<tr>
<td>14-Mar</td>
<td>---</td>
<td>Spring break</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>21-Mar</td>
<td>9</td>
<td>6-7</td>
<td>IV</td>
<td>TBA</td>
</tr>
<tr>
<td>28-Mar</td>
<td>10</td>
<td>7 + QUIZ 3</td>
<td>IV</td>
<td>TBA</td>
</tr>
<tr>
<td>4-Apr</td>
<td>11</td>
<td>7-8</td>
<td>V</td>
<td>TBA</td>
</tr>
<tr>
<td>11-Apr</td>
<td>12</td>
<td>8-9</td>
<td>VI</td>
<td>TBA</td>
</tr>
<tr>
<td>18-Apr</td>
<td>13</td>
<td>9 + QUIZ 4</td>
<td>VI</td>
<td>TBA</td>
</tr>
<tr>
<td>25-Apr</td>
<td>14</td>
<td>10</td>
<td>VII</td>
<td>TBA</td>
</tr>
<tr>
<td>2-May</td>
<td>15</td>
<td>10 + review</td>
<td>Wrapup</td>
<td>TBA</td>
</tr>
<tr>
<td>9-May</td>
<td>Finals</td>
<td>Final Exam May 11</td>
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</table>
DISCUSSION SECTIONS

In discussion sessions you work with classmates to solve a challenging problem in small groups. On quiz weeks there will be a group problem in the discussion session, which will count for 25% of your total quiz grade. Your group will solve that problem collaboratively with all group members receiving the same score for that problem.

LABORATORY SECTIONS

You have the same TA and work in the same group as in your discussion session. Labs are roughly coordinated with lectures, and are designed to give you an opportunity to test, expand and refine your understanding of basic physics concepts. Careful recording of observations in your lab journal and preparation of formal lab reports are important parts of this experience. Lab exercises must be carried out within the lab time with your group.

Because this course satisfies University requirements as a laboratory science class and as a writing intensive course, you must receive a minimum laboratory grade of 60% to receive a passing grade in the course. The laboratory grade will be based on the demonstration of a well organized and correct written technical communication of the physics concepts in your laboratory journal and laboratory reports, well thought out predictions and answers to the questions in the laboratory manual brought to class, and collaborative skills as evidenced by effective group work. Failure to participate in the laboratory will result in a laboratory grade of 0 for that topic. There are no make-up laboratories, except in situations officially recognized by the University. In that case, the laboratory work must be made up by arrangement with your instructor before your next scheduled laboratory period. Grades for the laboratory work will be determined in part by laboratory reports, in part by your work in the laboratory and in part by your work in answering the warmup questions turned in before lab. The predictions and questions assigned by your TA must be turned in no later than 24 hours before the laboratory time each week.

Your TA will check your lab notebook often to ensure you are keeping up a good record, but not every lab will be turned in for grading. The lab reports that will be turned in/graded are assigned by your TA and will be roughly every 2-3 weeks. Reports should be no longer than 6 nor shorter than 3 typed pages (using a word processor is required and such facilities are supplied by the University) including all necessary predictions, graphs, data tables, and calculations. Reports must be delivered to your laboratory instructor for grading no more than one week after they are assigned, the latest being at the next lab session. Late reports will not be accepted. Graded reports will be returned to you at your next laboratory meeting. Your first report (and only the first one) may be revised based on instructor comments to achieve a higher grade. The revised report must be given to your laboratory instructor within two days. Details of the laboratory grading are in your laboratory manual. Remember this is a writing intensive course so your grade will depend on your communication skills.

QUIZZES AND FINAL EXAM

• There will be four quizzes given in two parts. The first part of each quiz is a group quiz during the Thursday discussion section (50 min) on February 11, March 3, March 31, and April 21. The second part is an individual quiz (50 min) during the Friday lecture session on February 12, March 4, April 1 (no joke!), and April 22. For each quiz, the preceding Wednesday lecture will be devoted to preparatory review.
• The quizzes and final exam will consist of a mixture of multiple choice questions and longer worked problems. No books can be used. Only a TI-30xa or equivalent simple scientific pre-approved calculator will be allowed. No graphing or programmable calculators will be permitted. The use of any communication devices (cell phones, messaging devices, etc.) during tests is not allowed. **Each student can use a small 4x6 index card of handwritten notes that s/he has prepared.**

• To be successful in problem solving you must correctly apply physics principles and clearly communicate your understanding. To receive full credit on any problem, your solution must be complete and understandable to the grader, with clear algebraic formulation of the physics, explicit definitions of all the symbols used, and proper handling of units and significant figures. Whenever possible, problems must be solved algebraically before numbers are substituted. This method will be demonstrated in class.

• Grading for each quiz is **25% for the group part and 75% for the individual part. (25% for the group part, 25% for individual problem 1, 25% for individual problem 2, 25% for multiple choice questions).**

• **The lowest of the four quiz scores will be dropped** and the remaining best three will be averaged for your semester quiz score. **No makeup quizzes will be given.** If you must miss a quiz, it will be the one dropped.

• The final exam is on May 11, 8:30-11:30 am. Note that physics classes have a three-hour exam. (See [http://onestop.umn.edu/calendars/final_exams/spring2016.html](http://onestop.umn.edu/calendars/final_exams/spring2016.html)) If you have a university-accepted reason, you can request a different time. (See info in later section on make-ups.)

### IN-CLASS QUESTIONS (CLICKERS)

During lecture sessions there will be several questions posed to the class for which you must respond using your clicker. **For “Clicker” questions, you receive two points for a correct answer, one point for an incorrect answer and zero points for no answer.** These will relate to the concepts that are introduced in your reading and during the lecture, and demonstrations that are given in lecture. ICQ (clicker) points count for 10% of your final grade, so you’re getting 5% just for showing up. Clickers are available in the bookstore, and you need to register the clicker on Moodle.

### HOMEWORK

Suggested homework problems are listed below, but we will not be checking or grading homework. It is your responsibility to complete these problems and use them and their solutions to study. Each quiz will feature one question that is almost identical to one homework problem. That means that if you do all the homework problems then one quiz problem will be easy!

**Suggested homework:**

<table>
<thead>
<tr>
<th>Ch</th>
<th>Conceptual</th>
<th>MC</th>
<th>Problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2, 4, 9, 10, 16, 17</td>
<td>18, 21, 27, 28, 29</td>
<td>5, 10, 15, 24, 27, 35, 62, 64</td>
</tr>
<tr>
<td>2</td>
<td>1-3, 7, 9, 12</td>
<td>16-18, 20, 22, 24, 25</td>
<td>3, 8, 11, 17, 18, 20, 22, 25, 34, 35, 44, 61, 78-80</td>
</tr>
<tr>
<td>3</td>
<td>1, 5, 8, 10, 15</td>
<td>19-20, 22-24</td>
<td>1, 5, 7, 11, 13, 15, 16, 18, 25, 27-29, 31, 36, 38, 40, 57, 62-64, 71, 76-82</td>
</tr>
<tr>
<td>4</td>
<td>1-3, 5, 6, 10, 15</td>
<td>21-29</td>
<td>3-12, 14, 16, 18, 19, 23, 24, 33, 34, 36, 37, 46-48, 51, 66</td>
</tr>
</tbody>
</table>
 REQUIRED MATERIALS

  • The regular text has 30 chapters, but the bookstore has a special UMN edition. (Vol. 1) of the custom edition that contains chapters 1-10, covering Phys 1101. Vol. 2 of the custom edition contains chapters 11-25 and 28, covering Phys 1102. You are free to use either the full textbook or Volume 1 of the custom UMN version (which is cheaper) for this class. However, if you plan to take PHYS 1102, you will need the later chapters.

Lab Manual (required): College Physics Laboratory: Mechanics (available online as a downloadable pdf file through the course website).

Lab Journal (required): A graph-ruled lab notebook, for example the U of M 2077-S available in the bookstore.

Personal Responder (clicker): (required) I-Clicker (Radio Frequency Classroom Response System available from bookstore. If you have one you used recently at the UMN, this may work – we’ll have time for testing this out. Register the clicker in Moodle.

Ti-30xa Calculator or other simple scientific calculator. These are the only type of calculator that will be permitted during quizzes and the final exam. No graphing calculators are permitted.

Supplementary (optional) course materials: The Competent Problem Solver for Introductory Physics, by Heller and Heller. (available for free online as a downloadable pdf file through the course website).

GRADING

Your grade will be made up of the following components:

  • Class participation (monitored via clickers): 10%
  • Quiz score (average of best 3 out of 4): 40%
  • Final exam: 25%
  • Lab: 25%
You must receive a lab score of at least 60% in order to pass the class! This rule is necessary to qualify the course for its writing-enhanced curriculum status. The lab reports constitute the writing component. Lab scores are a combination of the warm-up questions, class participation, and lab reports.

Extra credit opportunities:

- A 2% bonus if you do not miss more than one lecture session
- A 1% bonus each for completing a student survey at the semester midpoint and end.

Your final letter grade will be based on the following table:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100-95</td>
</tr>
<tr>
<td>A-</td>
<td>95-90</td>
</tr>
<tr>
<td>B+</td>
<td>90-85</td>
</tr>
<tr>
<td>B</td>
<td>85-80</td>
</tr>
<tr>
<td>B-</td>
<td>80-75</td>
</tr>
<tr>
<td>C+</td>
<td>75-70</td>
</tr>
<tr>
<td>C</td>
<td>70-65</td>
</tr>
<tr>
<td>C-</td>
<td>65-60</td>
</tr>
<tr>
<td>D+</td>
<td>60-50</td>
</tr>
<tr>
<td>D</td>
<td>50-40</td>
</tr>
<tr>
<td>F</td>
<td>Less than 40% or Lab grade &lt; 60%</td>
</tr>
</tbody>
</table>

At the boundaries, the higher letter grade prevails. For example, 90% is an A-, not a B+. Percentages are rounded to the nearest integer percent.

**ATTENDANCE POLICY**

- Physics 1101W has an interactive lecture. You’ll contribute to the classroom by asking and answering questions, both verbally and by using the clicker system. Please avoid late arrivals and early departures. The class session is not over until the lecturer has signaled that it is done. Cell phones and other mobile devices should be turned off during class. Computers should only be used for note taking and must not be a distraction to you or to others around you.

- Lecture participation as measured by the clickers is part of your grade. In addition, you can earn a 2% bonus on your final grade if you do not miss more than one lecture session!

- Discussion / lab tardiness and absences. Since both discussion and lab sections require activities to be done as a group, attendance is mandatory – you may jeopardize the grade of your classmates as well as yourselves if you are not there or arrive late. Each unexcused absence for discussion sections will result in a 25% deduction on the group portion of your next quiz. Similarly, each unexcused absence for lab will result in a 25% deduction on your next lab report. An arrival after 10 minutes counts as an absence for discussion sections; arrival after 30 minutes counts as an absence for labs. If you arrive to lab late, but less than 30 minutes, you’ll lose the points for the warm-up questions that day. **On discussion section quiz days, you must arrive on time in order to take the quiz with the group and to receive full quiz credit.**

**MAKE-UPS**

As specified by University policy, missed quizzes will result in a grade of zero except in the event of
conflicts with scheduled activities of official University organizations, religious holidays, and verifiable illnesses as prescribed by University regulations. The course instructor must be notified at the beginning of the semester or as soon thereafter as possible (no less than three weeks in advance) about conflicts due to scheduled, official University activities or religious holidays. Disputes concerning the validity of an excused absence will be settled in consultation with the Director of Undergraduate Studies in Physics.

A make-up final exam will be given only for students with valid, verifiable conflicts of these types, or students with three final examinations in a 16-hour period if our exam is the middle of the three exams. You must make a request by 4 pm May 6th in order to take the make-up final. You can complete the form at any time, and no longer need to come to the office in person. Contact info@physics.umn.edu with any questions. The link to request the make-up final is: http://goo.gl/forms/Yts4LpTxR0

DEPARTMENTAL AND UNIVERSITY POLICIES

ATHLETES must provide their official University of Minnesota athletic letter containing the approved competition schedule to their instructor and the staff in the Williamson physics office. Away exams will be arranged with the athletic adviser traveling with the team. Accommodations will be made for official university sports only (i.e. no accommodations will be made for intramurals, club sports, etc.)

DISABILITY SERVICES: If you have accommodations for this course, please provide the staff in the Williamson physics office with a copy of your accommodation letter for the current semester. Exams will be arranged according to accommodations and sent to the testing center for administration.

PRIVACY: Minnesota privacy laws require that tests and other materials are returned in a manner that ensures that no one else can see your grades. Papers will be handed out at the first recitation after grading is completed.

ACADEMIC INTEGRITY

All work that you turn in for a grade must be your own. The following behaviors are considered to be cheating:

- Using the responder (clicker) of another student
- Copying all or part of a lab report, data table or fabrication of data (see Intro, pg. 3 of Lab Manual)
- Copying all or part of a quiz or final exam
- Any other matter covered by the University statement below.

Your TAs are observant! They notice duplication in lab reports and quiz problems.

MANDATORY STATEMENT ABOUT ACADEMIC INTEGRITY

The University expects the highest standards of honesty and integrity in the academic performance of its students. Any act of scholastic dishonesty is regarded as a serious offense, which may result in expulsion. Scholastic dishonesty is defined as plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research
procedures, or data analysis. Aiding and abetting an act of scholastic dishonesty is also considered a serious offense with the same possible consequences. Students may not make commercial use of their notes of lectures or University-provided materials without the express written consent of the instructor. (See the Senate policy at: http://policy.umn.edu/education#Education. Academic dishonesty in any portion of the academic work for a course shall be grounds for awarding a grade of F or N for the entire course. See http://regents.umn.edu/policies/index

MANDATORY POLICY LINKS:

• Student conduct code http://regents.umn.edu/sites/default/files/policies/Code_of_Conduct.pdf
• Scholastic Dishonesty  
  See student conduct code. Also for an FAQ on what actions could constitute scholastic dishonesty:  
  http://oscai.umn.edu/avoid-violations/avoiding-scholastic-dishonesty  
  http://oscai.umn.edu/address-misconduct/promoting-academic-integrity
• Disability Accommodations http://ds.umn.edu/student-services.html
• Use of Personal Electronic Devices in the Classroom  
  http://www.policy.umn.edu/Policies/Education/Education/STUDENTRESP.html
• Appropriate Student Use of Class Notes and Course Materials  
  http://www.policy.umn.edu/Policies/Education/Education/STUDENTRESP.html
• Makeup Work for Legitimate Absences  
  http://policy.umn.edu/Policies/Education/Education/MAKEUPWORK.html
• Grading and Transcripts  
  http://policy.umn.edu/Policies/Education/Education/GRADINGTRANSCRIPTS.html
• Sexual Harassment  
  http://regents.umn.edu/sites/default/files/policies/SexHarassment.pdf
• Equity, Diversity, Equal Opportunity, and Affirmative Action  
  http://regents.umn.edu/sites/default/files/policies/Equity_Diversity_EO_AA.pdf
• Mental Health and Stress Management  
  http://www.mentalhealth.umn.edu

LIBERAL EDUCATION

The class exposes the student to physical principles and concepts, demonstrates how these principles can be applied to quantitatively describe natural phenomena, and provides the student with an opportunity to perform hands-on experiments and measurements that model how physical knowledge is obtained. The basic principles of classical mechanics and conservation principles are described with particular emphasis on conceptual understanding of the way the real world works based on a few fundamental principles of physics, using mathematical analysis at the algebra level. The development of conceptual understanding of physical principles and their quantitative application are further deepened in the discussion section, where students practice problem-solving skills. In addition, familiarity with the methods and findings of the physical sciences not only forms a crucial component of a common education, but also prepares students to be scientifically literate citizens.

Because all knowledge in the physical sciences is empirically acquired, the laboratory component of the course is essential to properly expose students to the scientific method and the ways of knowing and thinking in the physical sciences. The lab component involves the formulation of scientifically sound predictions by the student, followed by empirical testing of the hypotheses through hands-on experimentation. Since the language of the physical world is mathematical, quantitative analysis of experimental data is an essential aspect of the lab experience. Physics, like all sciences, is a social endeavor, and students are exposed to cooperative problem solving, working in small groups with other students, in both the laboratory and discussion sections of the course.