UNIVERSITY OF MINNESOTA
School of Physics and Astronomy

Physics 1302W.100 – Introductory Physics for Science & Engineering II

Professor Gregory Pawloski:
Office: PAN 344
Email: pawloski@physics.umn.edu
Office Hours: Friday 8:00-9:00 in Willey 125 or by appointment

Class Times and Place:
Lecture: M Tu W 8:00-8:50 Willey 125
Quiz day: F 8:00-8:50, Willey 125

Texts:
Eric Mazur, Principles and Practice of Physics, Part 2, Chapters 16-34. (Bookstore)
   This book is organized as two volumes. One is Principles and the other is Practice. The chapters in the two volumes are coordinated.

Quadrille-ruled, hardbound laboratory journal –University of Minnesota 2077-S (Bookstore)

Lab Manual, free download at:

Other required materials:
i>Clicker student response system (Bookstore):
   We will use the i>Clicker response system for in-class questions. You must purchase the remote for this system at the University Bookstore. We are using the same system as for classes in Chemistry and Biology, so if you are taking more than one class using this system you only need to get one remote unit.
   The in-class questions will be worth 2 points for a correct answer, 1 point for an incorrect answer, and 0 points for no answer. When tabulating your final score from the clicker questions, we will remove 25% of the questions (removing your lowest scoring questions). For instance, if 100 clicker questions are asked during the semester, only your top 75 scoring questions will be used in the grade calculation.

In order to get credit for these questions, you must register your clicker at https://ay15.moodle.umn.edu/course/view.php?id=12876. In the upper left corner there is a block with the titled I>Clicker. Click on the Student Registration link in this block and follow the directions. There’s no charge for this.
Quizzes: Each quiz will be in two parts: a group problem that you will solve in the discussion sections the Thursday of each quiz week, and an individual portion that will be in lecture on Friday. Only those participating in all discussion sessions during the preceding weeks will be allowed to take the group part of the quiz. Quizzes are on February 11/12, March 3/4, March 31/April 1, and April 21/22.

Final Exam: The final will take place on Thursday, May 12, 6:30-9:30 pm.

Make Up Final Exam: Students that have a recognized conflict can take a make up final exam on Friday, May 13 in the morning. In order to be able to take the make up, you must fill out a request form before 4pm on May 6th. The form can be found at: http://goo.gl/forms/Yts4LpTxR0

Discussion section and Laboratory TAs:

Section  Teaching Assistant
101/102  Harison Wiesman wiesm010@umn.edu
103/104  Shuhui Luo luox370@umn.edu
105/106  John Kohler kohle110@umn.edu
107/108  Alex Gilman gilma080@umn.edu
109/110  Daniel Schubring schub071@umn.edu
111/112  Jiaming Zheng zheng369@umn.edu
113/114  Ragnar Stefansson stefal34@umn.edu
115/116  Pro Sahu sahux026@umn.edu
121/122  Jiaming Zheng zheng369@umn.edu
123/124  Daniel Schubring schub071@umn.edu
125/126  Harison Wiesman wiesm010@umn.edu
127/128  Shuhui Luo luox370@umn.edu
129/130  Pro Sahu sahux026@umn.edu
131/132  Alex Gilman gilma080@umn.edu
133/134  John Kohler kohle110@umn.edu

Discussion sections will start meeting on the first Thursday of the semester.
Course Style:
Physics 1302 is generally considered to be a demanding course. Your grade will depend on successful completion of a large number of tasks. If you are taking this course, you are likely sufficiently intelligent to do well in it. However, to actually do well, you will need to be organized and to complete the required assignments on time.

What You Need to Do for Physics 1302:

Before Class: Keep up with the textbook reading assignments in the Class Schedule below.

During Class: Listen, think, discuss, ask questions, do problems and report answers with the iClicker system. You are encouraged to work with students sitting near you to solve the in-class problems.

During Discussion Sessions: Participate in problem sessions on Thursdays. Appear on time to work in your assigned group on a problem that will be given at the beginning of the session.

During Lab Sessions: Appear on time for your assigned lab section ready to work with your lab partners to make observations and measurements regarding physical phenomena that are discussed in class. Your lab instructor will provide additional information about lab write-ups (required because this class is listed as writing-intensive). There will be labs every week of the semester, including the first week.

Outside of Class: Do the assigned homework problems.

Take four quizzes on Thursdays/Fridays and one Final Exam as noted above. The Thursday sections of the quizzes will be a group problem, done in class. It will count for 25% of your total grade for that quiz. The Friday sections of the quizzes (75% of the total quiz grade) will be done individually.

GRADING:

The grade for Physics 1302 will be based on 4 quizzes, laboratory, in-class questions, and a final examination.

The majority of your grade in this course will be based on your ability to communicate your physics knowledge by solving problems on quizzes and on the final examination. Problem solutions will be graded based on your written communication of a logical and organized process grounded in the correct assessment of the physics of a situation. Pictures, diagrams, phrases, and a logical mathematical development with well-defined quantities are the key elements in this communication.

No credit will be given for disconnected diagrams, isolated equations, or any answer that is not justified by a preceding logical development. In the case of an incorrect solution to a problem, partial credit will be given for the communication of logical and organized solution steps up to
the point that the solution departs from a correct analysis of the physics involved. In other words, you will only receive credit if we can determine from your writing: what you are doing, why you are doing it, and that your reasoning is correct.

Quizzes: Quizzes will be given during the scheduled lecture period on the following Fridays: **February 12, March 4, April 1, and April 22.** The Friday sections of the quizzes (75% of the total quiz grade) will be done individually. The Thursday sections of the quizzes will be a group problem, done in class. It will count for 25% of your total grade for that quiz. They will be completed during the discussion session the day before (**February 11, March 3, March 31, and April 21**). That groups section will be solved collaboratively by your group with all group members receiving the same score for that problem. **Only those participating in all discussion sessions during the preceding weeks will be allowed to take the group part of the quiz.** Quizzes will be returned in either laboratory or discussion section the following week. **No make-up quizzes will be given.** As noted in the grading scheme below, one quiz may be dropped.

Laboratory:

Because this course satisfies University requirements as a laboratory science class and as a writing intensive course, you must pass the laboratory (60% of the possible score) to receive a passing grade in the course. The laboratory grade will be based on pre-lab quizzes, well thought out predictions, collaborative skills as evidenced by effective group work and a well organized and correctly written technical communication of the physics concepts of this course in your laboratory journal and laboratory reports.

You will write a total of five laboratory reports. **The specific part of the laboratory for which you will write a report will be assigned to you by your instructor at the end of each laboratory topic (about every two-three weeks).** Reports should be about 4 typed pages. The reports must be printed (the University supplies word processor facilities if you do not have your own) and include all necessary predictions, graphs, data tables, and calculations. **Reports must be given to your laboratory instructor for grading by the deadline set by your Lab Instructor, generally one week after they are assigned. Late reports will not be accepted.** Graded reports will be returned to you about one week after submission. Details of the laboratory grading are in your laboratory manual. Read the relevant portions of the lab manual before attending a lab. Each lab has several sections, your TA will tell you which sections to have prepared each week. All the laboratory problems have sections called Prediction and Method Questions. You should hand in your answers to these sections by the deadline specified by your Lab Instructor. Failure to participate in the laboratory will result in a laboratory grade of 0 for that topic. Since the laboratory involves teamwork, no laboratory makeup will be allowed except in situations officially recognized by the University. In that case, the laboratory work must be made up by arrangement with your TA before your next scheduled laboratory period. The lab is done in the same small groups as the discussion sections, which are changed periodically. Lab data is taken cooperatively, but you are responsible for writing your own
reports. Unexcused absences or lateness by more than 10 minutes will result in a zero grade for any lab report required for that lab.

**Final examination:** A 3-hour final will be given on Thursday, May 12, 6:30-9:30 pm. Extra time that night will be available for those who work more slowly.

**In-Class Questions:** At random times during the lecture you will be asked to answer a question to be answered via the iClicker system. These will be graded on a scale of 2 points for a correct answer, 1 point for an incorrect answer and 0 points for no answer. When tabulating your final score from the clicker questions, we will remove 25% of the questions (removing your lowest scoring questions). For instance, if 100 clicker questions are asked during the semester, only your top 75 scoring questions will be used in the grade calculation.

**Homework:** Homework problems will be assigned, but not turned in for a grade. However, it is important to work out these problems to gain experience and training in problem solving that will be required for the quizzes. Although the problems will not be graded, it is to your benefit to understand these problems. **At least one problem per quiz will be adapted from a Homework problem.**

**Course grade:** The course grade will be determined by combining the grades from the various components of the course in the following way.

(a) In-lecture questions will count for 5%.

(b) The laboratory will count for 20%. (But remember, at least 60% of the total lab grade must be earned to pass the course.)

(c) The total grade from the quizzes will count for 50% (your lowest quiz will be dropped).

(e) The final will count as 25%.

All grades will be on a scale of 0-100%. The numerical score will be weighted in accordance with the unit distribution given above, again on a scale of 0-100. The final letter grade for the course will then be assigned as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Numerical Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>greater than or equal to 88</td>
</tr>
<tr>
<td>A-</td>
<td>less than 88 and greater than or equal to 83</td>
</tr>
<tr>
<td>B+</td>
<td>less than 83 and greater than or equal to 78</td>
</tr>
<tr>
<td>B</td>
<td>less than 78 and greater than or equal to 73</td>
</tr>
<tr>
<td>B-</td>
<td>less than 73 and greater than or equal to 68</td>
</tr>
<tr>
<td>C+</td>
<td>less than 68 and greater than or equal to 62</td>
</tr>
<tr>
<td>C</td>
<td>less than 62 and greater than or equal to 56</td>
</tr>
<tr>
<td>C-</td>
<td>less than 56 and greater than or equal to 50</td>
</tr>
<tr>
<td>D+</td>
<td>less than 50 and greater than or equal to 45</td>
</tr>
<tr>
<td>D</td>
<td>less than 45 and greater than or equal to 40</td>
</tr>
<tr>
<td>F</td>
<td>less than 40 or a laboratory grade less than 60%</td>
</tr>
</tbody>
</table>

If the entire class gets over 88 points, the entire class will get A grades.
**Tutoring**

Tutors will be available in Williamson Hall near the lab space beginning the second week of classes.

**Peer-assisted Learning sessions**

Weekly on Tuesdays, 2:30-3:20 in Akerman 211

Begins January 26. No need to sign up. Just come!

**Why attend PAL?**

- Led by a trained, experienced undergraduate PAL facilitator
- Reinforces lectures and text material through small group work with other motivated peers
- Concentrated focus on course concepts
- Practice in solving problems
- Meet classmates in an informal learning environment
- Efficient way to get in study time
- Research shows consistent participation in PAL (10 or more times) can improve grades by a half to a whole letter

**Questions and Concerns:**

You are welcome to address your questions or concerns to the course instructor and/or the Teaching Assistants in person (e.g., after a lecture) or by email. However, it should be noted that the professor in this class receives a great deal of e-mail in a day, and so your e-mails may not be immediately returned or might even get buried among a sea of emails. Office hours would be the best form of contact.

The goal of this course is to improve your knowledge and understanding of physics. If something is interfering with that goal, you need to make your concerns known to somebody who can address them.

**Make-ups:**

There are no make-up quizzes. If you miss a quiz, in most cases that will be the quiz you “drop” for grading purposes. 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 or religious holidays, 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. Requests for make-ups for reasons other than those specified by University policy cannot be honored.
Other information: The official web page for the Physics 1302W.100 is:

https://www.physics.umn.edu/classes/2016/spring/Phys%201302W.100/index.html

General course information, lecture notes, and other items will be made available through this class web site. 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 discussion section after grading is completed.

CHEATING: Don’t do it!

All work that you turn in for a grade must be your own. The following behaviors are considered to be cheating:
a. Using the clicker of another student
b. Copying all or part of a lab report, data table or fabrication of data (see Intro, pg. 3 of Lab Manual)
c. Copying all or part of a homework assignment or exam
d. 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 submission of false records of academic achievement; cheating on assignments or examinations; plagiarizing, altering, forging, or misusing an academic record; taking, acquiring, or using test materials without faculty permission; acting alone or in cooperation with another to obtain dishonestly grades, honors, submission of false records of academic achievement; cheating on assignments or examinations; plagiarizing, altering, forging, or misusing an academic record; taking, acquiring, or using test materials without faculty permission; acting alone or in cooperation with another to obtain dishonestly grades, honors, awards, or professional endorsement. 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://www.policy.umn.edu/Policies/Education/Education/STUDENTRESP.html.) 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.
Student Mental Health and Stress Management
As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. University of Minnesota services are available to assist you with addressing these and other concerns you may be experiencing. You can learn more about the broad range of confidential mental health services available on campus via http://www.mentalhealth.umn.edu/.

Classroom courtesy

Lectures end when the idea or technique under discussion has been concluded and the lecturer has indicated that the students are free to leave. For this reason lectures are rarely expected to end exactly at the end of class time. Packing up books, putting on coats, or standing up while the lecture is in progress interferes with the learning of other students and shows disrespect for the educational process. Those who must leave early should sit near the end of a row to minimize the disturbance they will inflict on the other students, however consistent with a seating plan that will be introduced to optimize group activities. Cell phones, MP3 players and similar devices must not be used and must be turned off during the lecture period. Computers may only be used for taking class notes, and keyboarding must not be a disturbance to other members of the class. Note that food and drinks are not allowed in the class room.

ATHLETES must provide their official University of Minnesota athletic letter containing the approved competition schedule to their instructor and the 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 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.

OTHER POLICIES:
The policies described in detail by the following links are also included in this Syllabus.
• Student conduct code
  http://www1.umn.edu/regents/policies/academic/Student_Conduct_Code.html
• Scholastic Dishonesty
See student conduct code

• Disability Accommodations
  http://ds.umn.edu/student-services.html

• Use of Personal Electronic Devices in the Classroom
  http://policy.umn.edu/Policies/Education/Education/CLASSROOMPED.html

• Makeup Work for Legitimate Absences
  http://policy.umn.edu/Policies/Education/Education/MAKEUPWORK.html

• Appropriate Student Use of Class Notes and Course Materials
  http://policy.umn.edu/Policies/Education/Education/CLASSNOTESSTUDENTS.html

• Grading and Transcripts
  http://policy.umn.edu/Policies/Education/Education/GRADINGTRANSCRIPTS.html

• Sexual Harassment
  http://www1.umn.edu/regents/policies/humanresources/SexHarassment.html

• Equity, Diversity, Equal Opportunity, and Affirmative Action
  http://www1.umn.edu/regents/policies/administrative/Equity_Diversity_EO_AA.html

• Mental Health and Stress Management
  http://www.mentalhealth.umn.edu
## Tentative Schedule

<table>
<thead>
<tr>
<th>Week / Date</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Lab problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 / Jan 18</td>
<td>MLK Holiday</td>
<td>Intros, E-charge (Chap 22)</td>
<td>Coulomb (Chap 22)</td>
<td>BEMA</td>
</tr>
<tr>
<td>2 / Jan 25</td>
<td>E-field vectors (Chap 23)</td>
<td>E-Field (Chap 23)</td>
<td>Dipoles (Chap 23)</td>
<td>Lab I 1,2 E-field vectors</td>
</tr>
<tr>
<td>3 / Feb 1</td>
<td>E-Field lines (Chap 24)</td>
<td>Flux (Chap 24)</td>
<td>Gauss (Chap 24)</td>
<td>Lab I 3,4,5 E-force</td>
</tr>
<tr>
<td>4 / Feb 8</td>
<td>Gauss (Chap 24)</td>
<td>E-potential (Chap 25)</td>
<td>Potential energy (Chap 25) Quiz 1 (22-24)</td>
<td>Lab II 1,2, E-field/potential</td>
</tr>
<tr>
<td>6 / Feb 22</td>
<td>Capacitors (Chap 26)</td>
<td>Dielectric (Chap 26)</td>
<td>Batteries (Chap 26)</td>
<td>Lab III 1 Capacitor energy</td>
</tr>
<tr>
<td>7 / Feb 29</td>
<td>Current (Chap 31)</td>
<td>DC circuits (Chap 31)</td>
<td>Kirchhoff (chap 31) Quiz 2 (25,26)</td>
<td>Lab III 2,3,4 Capacitors</td>
</tr>
<tr>
<td>8 / Mar 7</td>
<td>Kirchhoff (Chap 31)</td>
<td>RC circuits (Not in Mazur)</td>
<td>RC circuits (Not in Mazur)</td>
<td>Lab IV 1,2,3,8 Simple circuits</td>
</tr>
<tr>
<td>9 / Mar 14</td>
<td>Spring Break</td>
<td>Spring Break</td>
<td>Spring Break</td>
<td>Spring Break</td>
</tr>
<tr>
<td>10 / Mar 21</td>
<td>Magnetism (Chap 27)</td>
<td>Magnetic force (Chap 27)</td>
<td>Magnetic force (Chap 27)</td>
<td>Lab IV 9,10 Kirchhoff</td>
</tr>
<tr>
<td>11 / Mar 28</td>
<td>B-field (Chap 28)</td>
<td>B-field (B&amp;S) (Chap 28)</td>
<td>B-field (ampere) (Chap 12) Quiz 3 (31,27)</td>
<td>Lab IV 4,5,6,7 RC circuits</td>
</tr>
<tr>
<td>12 / Apr 4</td>
<td>B-Field /B-dipoles (Chap 28)</td>
<td>B-materials (Not in Mazur)</td>
<td>Faraday (Chap 29)</td>
<td>Lab V 1,7,8 B-force</td>
</tr>
<tr>
<td>13 / Apr 11</td>
<td>Faraday (Chap 29)</td>
<td>Inductance (Chap 29)</td>
<td>B-field energy (Chap 29)</td>
<td>Lab V 2,5,6 B-Field of coils</td>
</tr>
<tr>
<td>14 / Apr 18</td>
<td>Displacement I (Chap 30)</td>
<td>EM Waves (Chap 30)</td>
<td>EM energy (Chap 30) Quiz 4 (28,29)</td>
<td>Lab VI 1,2,3,4 8-flux</td>
</tr>
<tr>
<td>15 / Apr 25</td>
<td>AC (Chap 32)</td>
<td>AC circuits (Chap 32)</td>
<td>RC (Chap 32)</td>
<td>Lab VI 5,6 Generator</td>
</tr>
<tr>
<td>16 / May 2</td>
<td>LC resonance (Chap 32)</td>
<td>AC Power (Chap 32)</td>
<td>AC circuits (Chap 32)</td>
<td>BEMA</td>
</tr>
</tbody>
</table>