Profs. Murray Holland and Dana Anderson

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Lectures:  
MWF 10 A.M. (Section 200)  
MWF 1 P.M. (Section 100) Both in Duane G-1B30

Recitations:  
Tuesdays in Duane basement rooms; see the section schedule. (There are two Tutorial spaces and you are assigned to attend one of them.)

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<tr>
<th>Prof. Holland's office:</th>
<th>JILA S-366 (in the south wing of JILA, third floor)</th>
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<tr>
<td>Office hrs:</td>
<td>MWF after lectures (behind stage), and in Help Room (G2B87), or by app't (any time)</td>
</tr>
<tr>
<td>e-mail:</td>
<td><a href="mailto:murray.holland@colorado.edu">murray.holland@colorado.edu</a></td>
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<tr>
<th>Prof. Anderson's office:</th>
<th>JILA A-406a (in the JILA Tower, 4th floor)</th>
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<tr>
<td>Office hrs:</td>
<td>WF 2-2:50 PM in the Help Room (G2B27)</td>
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<tr>
<td>e-mail:</td>
<td><a href="mailto:dana@jila.colorado.edu">dana@jila.colorado.edu</a></td>
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Learning Goals: Phys1120 is the 2nd semester of introductory physics. We emphasize conceptual understanding and problem solving skills. We cover electricity, circuits, magnetism, electromagnetic waves, light, and optics: the foundations of our modern technological society. Our goals are for you to continue developing knowledge and intuition about how the world works, to learn to approach, solve, and understand physics problems on both qualitative and quantitative levels, to relate classroom physics to the real world you live in, and to develop a deeper appreciation of the scientific method.

Most of the material we will cover this semester involves discoveries no more than 150 years old. (Of course, even the ancients knew some things about magnetism and light). We are so comfortable with technologies like television and computers, that it is easy to forget just how recent these developments are: some of you may have relatives old enough to remember the days before radio (the first licensed broadcast station opened in 1920). We live radically more convenient and perhaps longer and more enjoyable lives due to the revolution in electric-based technology. Modern health-care, industrial, and home tools are almost entirely based upon the existence of electrical power and electronic circuitry. By the end of this course, you should have a base of knowledge that will allow you to better understand how many modern electronic instruments work.

(Click here for more details on our learning goals)

Pre/Corequisites:
Calc II (MATH 2300/APPM 1360) must be taken at least in parallel. You should have a strong working knowledge of algebra, trig, Calc I, and Phys1110. Phys 1140 lab is highly recommended. Enthusiasm, curiosity, and an open mind will also be helpful!

The required textbooks
1) "Physics", R. Knight, Vol. 3,4 (second edition, Ch 20-36). You should be able to survive with the first edition even though it is not the official text. (There will be some copies on reserve in the Duane Math/Physics Library, one floor above the lecture hall)
2) "Tutorials in Introductory Physics", McDermott (custom edition for the University of Colorado at Boulder). This 2-volume set is required for use in our recitations. (You must bring the tutorial book every Tuesday, you'll be working out of them!)
3) iClickers (See grades page for details)

READ ASSIGNED CHAPTERS BEFORE WE COVER THEM IN CLASS and go to lecture
knowing what you understand and don't understand so that you can ask questions while we're still on the topic. The purpose of lecture is to clarify your understanding, to help you make sense of the material. If you don't read in advance, lectures will be much less useful to you. (Imagine going to a class on Shakespeare without doing the readings - the prof is not going to read the plays for you!) I will assume you have done the required readings in advance! We'll cover roughly one chapter/week, starting with Ch. 26. Each week, CAPA will include one question associated with that week's reading assignment.

**CAPA (an internet based homework system: Computer Assisted Physics Assignments)** You will receive a weekly printed personalized homework assignment. Each student's assignment is slightly different. You log onto CAPA via the web to "hand in" your answers. Work out your solutions on paper before you log on. The advantage is that you will have instant feedback on how well you are doing and will have opportunities to change wrong answers without penalty. (You will get multiple tries, generally 6, on each problem, with no points taken off for wrong answers. If you get it wrong all 6 times, that particular problem is "closed out" but you can still work on others. You can log off and come back later any time, there is no time limit or penalty except for the final deadline) New homework assignments will appear online. You need a 4 digit "pin" to sign on (different each week!), but you can have the system email this pin to you (go to the CAPA login page, there's a link there). Or, just pick up your personal hard copy in the 1120 bins in the basement. Homework will be due Fri nights at midnight (Late hw’s will not be accepted by CAPA.)

**Etiquette:** Please turn off all cell phones, laptops, pagers, etc. when entering any classroom. It is perfectly OK to interrupt the lecture by yelling “Question!”. Questions in lecture are always good! **We encourage collaborative teamwork on homework and tutorials, an essential skill in science and engineering** (and highly valued by employers!) Scientists and engineers work in groups as well as alone. Social interactions are critical to scientists' success - most good ideas grow out of discussions with colleagues. As you study together, try to help your partners get over confusions, ask each other questions, critique hw and tutorial write-ups. **Teach each other.** You will learn a lot!

Note: While collaboration is the rule in technical work, evaluations of individuals also play an important role. Exams will be done without help from others. For all assignments, the work you turn in must in the end be your own: in your own words, reflecting your own understanding.

**Recitations/tutorials:** This is a chance to work in a smaller setting with fellow students and trained teaching/learning assistants. Tutorials are designed to enhance your understanding of key principles dealt with in the class. You will hand in "tutorial homeworks", and work through worksheets in small groups at your own pace. It's more important for you to understand the material than to "cover" all the questions. You must take responsibility for your own learning! If you find yourself ahead of your partners, try to explain some physics to them. Explainers learn
even more than listeners. Attendance at tutorials is mandatory. Remember to bring your workbook to tutorial every week!

**Pretests:** There will be a required "pretest" (usually online) every week due before tutorial (it will go online after Friday lecture at noon, and turn off automatically Tuesday morning at 8 AM) You get full credit for participation. Entering nonsense, random characters, or leaving most of the pretest blank is not participation and will not lead to receiving credit. Use your 15 minutes to think and answer as best you can. Your specific answers are not graded, but they help get your mind cranking for the tutorial.

**The help room:** You can meet TA staff in Duane G2B87 (enter through G2B90). We will try to keep it staffed 9 to 5 Monday through Friday. This is a great place to meet with other 1120 students to work together on homework and studying, and get some personalized assistance.

**Grading and exams:** Your course grade is determined by a combination of your performance on exams, CAPA and tutorial homework, in-class and online participation. (See here for more details.)

- **Exam 1:** 7:30-9:15 PM, Tu. Feb 10, 15%
- **Exam 2:** 7:30-9:15 PM, Tu. Mar 10, 15%
- **Exam 3:** 7:30-9:15 PM, Tu. Apr 14, 15%
- **Final Exam:** 10:30AM-1:00PM, Tu. May 5, 18%

**CAPA Homework:** 15%

**Tutorial Homework:** 15%

**Tutorials:** Participation (pretests and attendance combined) 7%.

**Clickers:** In-class participation, extra credit (up to 12% of the midterm total). There will also be online participation opportunities (like surveys) which will also add some to clicker credit. See the grade info page for details!

**Exams:** There are no makeups. You may not miss any exam except for reasons beyond your control, approved by Prof. Holland or Anderson, which usually means a confirmed medical problem. (Not knowing which room your exam is in is not beyond your control) In the (unusual) case of an (at most, single) excused absence, your other exams will be used to compute an exam average. To pass 1120, you must take (or be excused from) all exams and the final.

You may bring a single 8.5 in. x 11 in. paper to exams, with your own handwritten notes. **Calculators** with scientific notation are allowed and sometimes needed. Mobile phones may not be used during exams in any capacity.

**Honor Code:** We trust every individual in this class to understand and follow the CU honor code. Please respect that trust! It's a large class, and we realize there may be some temptations -
we'll do our best to make the class valuable and worthy of your honorable behaviour! (The honor code at CU is really very cool, although the CU official wording about it is a little tough: *Violations of the honor code may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council (303-725-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions and non-academic sanctions (including but not limited to university probation, suspension, or expulsion).*

**Disabilities:** Students with disabilities, including non-visible disabilities, please let us know early in the semester (first two weeks) so that your academic needs may be appropriately met. You will need to provide documentation from the [Disability Services Office in Willard 322](phone 303-492-8671)

**Religious Observances:** We will make a strong effort to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, please send an e-mail to [murray.holland@colorado.edu](#) in the first week of classes if you anticipate a conflict. [See campus policy here.](#)

**Classroom Behavior:** Students and faculty each have responsibility for maintaining an appropriate learning environment. *We* have the professional responsibility to treat all students with understanding, dignity and respect, to guide classroom discussion and to set reasonable limits on the manner in which we (and you) express opinions. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender variance, and nationalities (which don't come up directly so often in Physics II... but you never know!) Class rosters are provided to the instructor with the student's legal name. We will gladly honor your request to address you by an alternate name or gender pronoun. Please advise your instructors (Prof Holland, Anderson and/or your TA) of this preference early in the semester so that we may make appropriate changes to my records. See policies [here](#) and [here](#).

**Discrimination and Sexual Harassment:** The [CU policies](#) on Discrimination and Harassment, Sexual Harassment, or Amorous Relationships apply to all students, staff and faculty. Anyone who believes s/he has been the subject of discrimination or harassment based upon race, color, national origin, sex, age, disability, religion, sexual orientation, or veteran status should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. Information about campus resources available to assist you regarding discrimination or harassment can be obtained [here](#).

**Important CU deadlines:** [Check here](#) for the official CU Add/Drop dates. At this time, Wed.
How to succeed in this course:

The course topics that we will cover in Physics 1120 are among the greatest intellectual achievements of humans. Don't be surprised if you have to think hard and work hard to master the material. You can perform very well in this class if you follow this time-tested system:

- Read the chapter material before lecture and recitation. If you read it first, it'll sink in faster during lecture. We won't repeat what's in the book - especially definitions. Lecture is for making sense of what's in the text!
- Take notes on your reading and try to write down questions you may have. If you ask those questions in class, we'll will try to answer them.
- Come to class. **Stay involved in class and tutorials.** Participate, engage! Come to office hours at the Physics Help Room.
- Start the homeworks early. Give yourself the time to work and understand. Remember that it's possible to have a perfect homework score by putting in the time and effort.
- But first: Do the reading. Don't try the homework until you finish the reading.
- Work together. Physicists often work in groups. You need to do your own thinking, but talking to others is a great way to sort out your thoughts.
- Check out our general guide to **Problem Solving Strategies.**
- Don't get behind. It's very hard to catch up.
- Don't skip anything. Every stone rests on another, and the whole building will collapse if any are missing.
- **Please,** get help early if you feel you are struggling with any aspect of the course (from your TA/ LA/Prof. or /help room/study group/tutor...) We're here to help!

- Don't give up! You can make total sense of all this stuff - it just may take some effort.

Being "good" at physics problem solving comes from practice. CAPA problems usually involve two steps: a decision about which principles and concepts of physics apply, and then a determination of the answer (which usually involves a calculation.) Tutorial homework concentrate even more on the principles and concepts, and your ability to explain what you are doing. We encourage you to talk about physics with your friends. The thing to talk about is not which number to put where (the calculation is the easy part), but the reasoning that helps you
decide what to do with the numbers.

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**Disclaimer**

Any information in this syllabus is as accurate as is possible at the time of writing. Future announcements about changes of any kind will be made in class, and (usually) posted on the web, and will *take precedence over the original syllabus*. You are responsible for what is said in class, whether or not you are in attendance.