This is the nuts-and-bolts information of the course, please read all of it (~15 minutes) and do not hesitate to contact Prof. Ursell with clarifying questions.

**Maybe the most important idea you will ever consider.**

Looking for class materials? (HWs, slides, videos, tutorials, etc?)

Looking for the weekly schedule?

Location and Materials for Class

- Class, 12 PM & 2 PM, MWF, Willamette 100
  - *ask questions!* This material is not intuitive and probably many people have the same/similar question
- no less than 40 minutes of each class will be spent covering new material
- some days we may spend the last 10 minutes working a HW-level problem together
- a recording of each lecture (not necessarily synchronous) will be posted each M/W/F
- All course materials -- slides, tutorial PDFs, HWs, quizzes, etc -- are in the 'Modules' section of Canvas.
- This syllabus will be updated as appropriate throughout the term

Tutorials / GEIs / GE Office Hours

- all tutorials occur in Willamette 112 (near the physics office)
  - *please* attend your registered section, we allocate GE resources based on the number of registered students
  - if you participated in a tutorial and did not receive credit via Canvas -- email your GE *not* Prof. Ursell
  - bring a writing utensil
  - all tutorial PDFs can be found here (scroll down to 'Tutorials (PDFs)')
- GE office hours, locations, and emails can be found on the weekly schedule
  - you may attend as long / as many as you like

Instructor / Office Hours / Emails / Announcements

- Prof. Tristan Ursell, [tsu@uoregon.edu](mailto:tsu@uoregon.edu)
- office hours (Will 375), Tues / Thurs, 5 - 6 pm
  - email Prof. Ursell to schedule meeting at an alternate time, subject to the constraints of having a life
- all communications with GEIs and Prof. Ursell should be professional, courteous, use full sentences and non-slang. State clearly how we can help and please be succinct.
  - we strive to respond within 24 hours
- Please pay attention to Canvas Announcements -- that is how Prof. Ursell communicates with the class.

Remote Options / Zoom Lectures

- non-synchronous versions of each lecture, covering approximately the same material, will be posted after each day of class (M/W/F)
to accommodate students who, for whatever reason, do not feel comfortable participating in-person due to COVID
  - one tutorial will be completely remote all term (zoom link) (see class schedule)
  - two office hours per week will be completely remote all term (zoom link) (see class schedule)

Graded Components

- **Exams**
  - there is no mid-term and no final exam, there will be lower-stakes’ quizzes every other week (see below)
  - the trade-off is that every other week you will have both a short quiz and a HW due

- **Quizzes (40%)**
  - **every other week** there will be a quiz on the previous 2 weeks' material, ~5 quizzes in total
    - this means that every other week there will be both a HW and a quiz
    - quizzes are open book and open notes
    - at no point should you be using information from any websites (e.g. chegg.com) or any other humans – such actions constitute academic dishonesty and will result in a course failure
  - each quiz will have ...
    - ~4 - 6 multiple choice questions, one potentially covering content from more than two weeks prior
    - ~1 calculation question
    - some may have no calculation question and more multiple choice
  - you will have 30 minutes to complete the quiz
    - the quiz will not auto-submit at the end of the 30 minutes
  - each quiz will take place at the same time for all students
    - Mondays, 7 - 7:30 pm
      - AEC accommodations will be made on a per-student basis
      - alternate times can be arranged for 'good' reasons
      - quizzes submitted after the deadline will not be accepted
      - the last quiz will take place at an alternate time (likely the Friday before finals week)
      - questions are not locked (i.e. you can go back)
  - the quiz average is calculated based on the total points earned (including any extra credit (EC) points) divided by the total points of the quizzes
  - see 'Academic Honesty' below ...

- **Home works (40%)**
  - see Canvas assignment for due dates
  - there will be one home work **each week** (~8 over the term, starting in Week 2)
  - each home work will be administered through Canvas
    - on Canvas they are called 'quizzes', but that's just the format
    - you will have 3 attempts on all parts without penalty
    - each day a HW is late reduces its value by 25%
  - some weeks, there may be a written problem for which you will upload hand-written (or typed) work
  - you may work with anyone you wish on HWs
  - the lowest HW will be dropped
  - everyone gets 1 'free' 48-hour HW extension
    - **you must request extensions before the HW is due**
      - after that 48-hour period, no extensions will be given, except in extreme circumstances
  - the HW average is calculated based on the total points earned divided by the total points of the HWs (minus the dropped HW)

- **Tutorials (15%)**
there will be 7 to 8 tutorials throughout the term
  • you may miss one tutorial without penalty
  • tutorials cannot be made up
  • there will be a few weeks without a tutorial
these are graded on your attendance and participation, not numerical correctness
they are intended to give you practice with material that will appear in HWs and Quizzes
the tutorial average is calculated based on the total points earned divided by the total points of
the tutorials (minus the dropped tutorial)
• Pre-lecture (5%)
  • at the beginning of each week, we will post short demonstration videos that should be watched
  • there will 1 - 2 'check-in' questions after the videos
  • these will be graded on completion only (i.e. you have as many attempts as needed to get full
points)
• Class Attendance
  • is your responsibility. You are not graded on it, but your grade is certainly correlated with it.
  • class time is used to introduce new conceptual and quantitative material, answer questions,
  and deliver pertinent class logistics
  • you are responsible for this content whether or not you are present in class

Textbook(s)
• Openstax College Physics
  • free, online college physics text
  • suggested readings will be given each week
    • you should read them before attending class
    • they are "suggested" because no one can force you to read the book
  • the old textbook: College Physics, Knight, Field & Jones, 4edt is also an excellent reference
    • I will indicate which sections in this text match with the Openstax assignments
    • primarily used as reference material
    • I'm sorry if you paid money for the ebook or print edition before checking the Duck Store's
      textbook search engine, I am trying to move UO away from expensive textbooks, and it has
      to start somewhere
    • there is a secondary market and a return on books at the Duck Store until 4/2/2022

Academic Honesty
• Quizzes are to be completed on your own. This means: no communication with other humans,
  websites, Al's, or anything other than your notes, the book, and other posted class materials.
  Evidence of cheating on a quiz will result in course failure; I fail students each term for this reason.

Evidence of direct copying on HWs will result in a score of 0% on the offending HW for all parties
involved.

How to Get Help
• Communication is the key ... generally, across life.
  • I want to help you, but I cannot help you if you do not communicate with me
  • Ask for help before the situation is dire
    • e.g. don't email me in week 10 asking how you can improve your grade; that leaves us with
      few-to-no options
• Life happens and college can be challenging. If you need help, start by emailing Prof. Ursell (tsu@uoregon.edu) -- this includes any situations or interactions with other students / GE's that are affecting your ability to participate in class and/or are affecting your ability to complete assignments. If the situation is serious, we may refer you to other UO resources (e.g. the counselling center). If, for any reason, you don't want to converse with Prof. Ursell, you can email Prof. Billy Scannell (scannell@uoregon.edu). Note that we are not designated reporters.
  o Mental Health Support Services: Call anytime to speak with a therapist who can provide support and connect you with resources.
  ▪ Located on the 2nd Floor of the Health Center, (541) 346-3227
  o The University's Tutoring and Academic Engagement Center provides a variety of workshops, individual consultations, writing assistance labs, tutoring, and more to assist UO students
  ▪ http://engage.uoregon.edu/
  ▪ https://advising.uoregon.edu/navigate-student (academic advising)
  o If there are aspects of the instruction or course design that result in barriers to your inclusion, please notify Prof. Ursell as soon as possible.
  ▪ You are also welcome to contact AEC in 164 Oregon Hall, (541) 346 1155

Problem Solving (a suggested checklist)

Here's a simple rubric that may help you in tackling challenging problems in this class (and others):

1. Read the problem in its entirety.
2. Think about the principles involved -- write them down! Which pieces are present in the problem? (e.g. this problem deals with charging a capacitor)
3. Write down the quantities that are known and the quantities you want to know. Note their units and keep track of those as you go through the problem.
4. State any appropriate equations, and relate them to (3).
5. Write down numbered steps indicating the logical progression of your reasoning, and your subsequent calculation.
6. Clearly mark your answer (underlined or in a box); this is not for me, it’s for you, you’d be surprised how many students just enter the wrong number from their work.
7. Don’t forget units — if a problem asks for an energy and your answer has units of length, something has gone off the rails. If a problem asks for energy in \(mj\) and you answer in \(J\), you’ll get it wrong. Check your significant figures.
8. Check your answer to see if it is reasonable. e.g. perform an “order of magnitude” estimate. Use your sense – if a question asks you to estimate the static electricity force between a feather rubbed on plastic, and you calculate 103,456 N of force (about 23,000 lbs), then clearly something is amiss. That said, one of the challenges of this course is that this material is not particularly intuitive, at least at first.

Learning Outcomes

Let's focus on 6 big, specific outcomes, of course there are many other potential skills and conceptual takeaways from the course. Passing this course:

1) Students should have a firm grasp of the connections between charge, electric fields, and electrical forces, with the ability to calculate relevant quantities, like vector forces, using algebraic techniques.

2) Students should be able to explain what a 'current' is, how voltage, resistance, and current are related, and should be able to calculate how these quantities relate to the function of a few simple everyday objects (like incandescent light bulbs or resistive heaters).
3) Student should be able to explain the connection between a current and the magnetic field it generates, the forces that a magnetic field exerts on a charged object, and they should be able to explain the connection between a changing magnetic field and the emf / current it generates.

4) Students should be able to articulate a rudimentary understanding of the connection between electric and magnetic fields, electromagnetic waves, and light (as a wave). They should also understand how light, energy, and color are related.

5) Students should be able to explain the quantized 'photon' concept of light, how we validate this model by experiments like double-slit diffraction and the photo-electric effect, and how it relates to the spectrum of light we see in the world around us (e.g. sun light).

6) Students should be able to explain what AC electricity is, basic principles informing the structure of the power grid and household electrical safety, and connect this material with (3) in explaining basic function of generators and transformers.

Diversity Statement

We all come from different backgrounds, have different experiences, operate under different constraints and challenges, value different things, exist within different frames of privilege, and are moving toward our own unique futures. Necessarily, those facts mean that which educational directions attract us and how we choose to express and identify ourselves will be personal and unique. The goal of college (and really society at large) is to support each other in those directions and expressions, as long as they support the same in others -- that's at the core of our shared humanity, and thus respecting each other's diversity (in all those ways mentioned above) and valuing the perspectives that we do not, nor may ever, know (or even agree with!) is paramount to an open, safe, functional, effective, and growth-oriented educational experience. I will uphold these ideals in practice in this class and I ask for your help -- I will not tolerate any denigrating speech, tacit (or explicit) dismissal of perspectives, or harassing behavior. I will strive to support students in the unique ways that they choose to appropriately express themselves in this class and I will take steps to ensure that our class is a space in which all students feel empowered to respectfully express themselves. Email Prof. Ursell with any concerns, thoughts, etc.

Changes to Syllabus

Prof. Ursell reserves the right to alter this syllabus, and will inform the class of any significant alterations via Canvas Announcements.