PHYS 2426.002 20826
University Physics II: Gravity, Electricity and Magnetism
COURSE SYLLABUS: FALL 2019

WE WERE GOING TO USE THE TIME MACHINE TO PREVENT THE ROBOT APOCALYPSE, BUT THE GUY WHO BUILT IT WAS AN ELECTRICAL ENGINEER.

(xkcd.com/567/)

Instructor: Dr. William Newton
Office Location: STC 236
Class time: MWF 2:00pm – 3:50pm, STC 146
Office Hours: T 11am-1pm, 2-3pm; W 4:00pm-5:00pm, R 8-9am or by appointment
Phone: 903-886-9331
University Email Address: william.newton@tamuc.edu
Graduate Teaching Assistant: Matt Deutsch; mdeutsch@leomail.tamuc.edu
Learning Assistants: Deanna Rogers and Kat Hardy; drogers10@leomail.tamuc.edu, khardy1@leomail.tamuc.edu
Preferred Form of Communication: Office visit, email, chat after class!
Communication Response Time: 24 hours

Syllabus/schedule subject to change

Textbook(s) Required: Access to *MasteringPhysics* online homework system, with *Knight, Physics for Scientists and Engineers, 4rd edition*. You have the option of buying *MasteringPhysics* with etext only (ISBN 9780321753052) or *MasteringPhysics* with etext and traditional textbook (ISBN 9780321844354).

McDermott, Tutorials in Introductory Physics Workbook and Homework package (ISBN 9780130970695). This comprises 2 books – one containing class activities, and one containing homework activities.

Course Description: Physics 2426 is the second semester of a calculus-based physics sequence. University Physics II introduces electrical and magnetic phenomena in nature, including the concepts of electrical charges, electric and magnetic fields, the application of Gauss' Law, electric potential, conductors and insulators, currents, basic circuits, and induction. It emphasizes the nature of force laws – properties of matter (mass, charge, current) that act as sources for forces, and provide recipes to calculate those forces – and how to calculate the effect of those forces on matter with similar properties. The two different approaches to problem solving: the force picture (involving fields) and the energy picture (involving potential) will be emphasized.

University Catalogue Description: Second semester of calculus based physics with topics in electricity and magnetism for science, mathematics, and engineering students. Prerequisites: PHYS 2425 with a minimum grade of C, MATH 2413. Additionally, MATH 192 or concurrent enrollment.

HOW THIS COURSE WILL WORK

THERE ARE TWO ASPECTS TO SCIENTIFIC KNOWLEDGE:

Content: the specific scientific knowledge that tells us how a particular set of phenomena in the real world works. In this class, it is the definitions and laws concerning how masses, charges and currents behave.

Skills: this is the toolbox that allows me to use the content knowledge in a practical way, to do useful things in the world. Just because I know how a car engine works, doesn't mean I can be a mechanic.

You need both content and skills. Note that the skills tend to be more universal: the content you learn in this class will be used only when you need to consider things involving gravity and electromagnetism. The skills you learn we be useful in many other classes, and far beyond (To be a car

mechanic, I need to be able to use a wrench, but being able to use a wrench means I can do a whole lot of other things too.) I will now list what I want you to learn in this class:

WHAT I WANT YOU TO LEARN BY THE END OF THIS CLASS

A much more detailed list of content and skill standards can be found on the standards spreadsheet (on D2L and as handouts)

Student Learning Outcomes: Content

1: Students will solve be able to solve problems involving forces between electrostatic and gravitational point* sources and test objects

2: Students will solve be able to solve problems involving Electrostatic, gravitational and magnetic fields of point sources, and the motion of test objects in those fields: Weeks 5-8

3: Students will solve be able to solve problems involving Fields from multiple point charges and continuous charge and mass distributions

4: Students will solve be able to solve problems involving Circuits

Student Learning Outcomes: Skills

1: Students will be able to effectively work in a group environment.

2: Student will demonstrate effective use of problem solving skills

3: Students will demonstrate effective use of mathematical skills

4: Students will be able to correctly categorize information, connect together concepts, and map problems onto the landscape of physics

5: Students will reflect on their own learning and the effectiveness of their study strategies, and make adjustments where required.

HOW I WILL ASSESS WHETHER YOU'VE LEARNED THESE THINGS

Things will be assessed a little different to how you're probably used to. I'll start off giving you the big picture:

Physics is a set of skills and processes that allow us to figure out how the natural world works. The things we uncover using physics is the content – in

this course the content covers electricity, gravity and magnetism – but *doing* physics consists of applying skills to use the content we do know to figure out content we don't.

I have listed in detail both the CONTENT and the SKILLS/PROCESSES that you will master throughout this course in a set of spreadsheets, 1 for each unit of material. Here are 4 units with a rough guide to the weeks we'll spend on each. The first week serves as an introduction to the course but still counts for course credit.

UNIT 1: Forces between electrostatic and gravitational point* sources and test objects: Weeks 2-5

UNIT 2: Electrostatic, gravitational and magnetic fields of point sources, and the motion of test objects in those fields: Weeks 5-8

UNIT 3: Fields from multiple point charges and continuous charge and mass distributions: Weeks 9-12

UNIT 4: Circuits: Weeks 12-15

In each spreadsheet you'll see the list of content, and next to that a list of skills and processes. For each one you'll be given a score of 0, 1 or 2.

2 means you have mastered the content, skill or process.
1 means that you are progressing towards mastery but aren't quite there yet.
0 means that you have yet to demonstrate understanding of the content or proficiency in the skill or process.

Everyone starts with a blank slate. Each week there will be one homework problem given in class, that you will write up and that will test a number of content items and skills/processes. In addition, each exam you take will test your mastery of a large number of content items and skills/processes. These two things – weekly problem write-ups and exams – are how you fill in these sheets with 1's and 2's.

Some of the content items involve demonstrating conceptual understanding. These are typically weighted a little higher than other content items. To demonstrate conceptual understanding, you must complete the weekly tutorial homeworks.

You will not get a traditional grade for exams. Each question on an exam will contain a list of content items and skills/processes that the questions assess.

You will get back the exam with 0's, 1's and 2's for each item on each question. These will guide you on what you need to work on.

Every Friday, the last 30-45 minutes of class will be devoted to working on improving your score on content items and skills/processes ***that have already been covered in exams or homework.*** Here you will get more chances to increase your score on the items; doing poorly on an exam is not a problem if you view the exam as feedback on what you need to work on – and then you will get chances to demonstrate mastery in those items during any of the subsequent Friday sessions.

There are a total of 5 midterm exams and a final exam. The final exam is cumulative and will be the last chance to increase your score on any of the standards. No testing of standards will be allowed after the final.

Your total score over the standards of the 4 units of the course will be turned into a total out of 70: **this will form 70% of your class grade.**

Of course, to make progress towards mastery requires much practice. The remaining 30% of the class grade will come from that practicing. Most weeks you will complete a MasteringPhysics assignment – these are worth 10% of your grade. You will watch videos over the material before we practice it in class, and read the textbook. **Before most classes there will be short quizzes over the material in the videos and the reading**. You should also review what we covered in class after each class. At the very beginning of most classes and the very end of most classes there will be **check-in and check-out** questions covering material from the previous class. Finally, you should constantly reflect on how you are doing in the class and whether the studying you do is effective – you will be asked to **complete regular surveys** to encourage you to do so. The online quizzes and surveys, and in-class check-in/out questions will be worth a total of 20% of your course grade.

You should treat exams and homework as feedback on how you're understanding the material.

Homeworks function for a different purpose in this class to most classes you have taken. Students often approach homeworks with the goal of getting a good grade. But this is not usually the instructors intention. Professors set homeworks so you can *practice* the things you learn in class. We don't expect you to be able to do everything right away, and some of the skills especially take quite a bit of practice. A better way of thinking about homeworks is they are like the practice sessions/training sessions you have to do to master a sport. The professor is like the coach. The assessments are the big games, and are the things that count – that you practice towards

IMPROVING SKILLS AND PROCESSES

Many of the skills we emphasize are likely to be fairly new to you, and I don't expect you to master them immediately. Therefore, on the skills/processes section of the standards, if you score higher from one unit to the next, I will replace all previous scores in your improving streak with the highest set of scores.

GRADING

Item	Percentage of Class Grade
Standards based assessment Assessed through exams, problem solving write-ups, tutorial homeworks, in-class observation and Friday assessments	70%
MyLeoOnline Quizzes/Class check-in and out questions/weekly metacognitive survey	20%
MasteringPhysics (Online) Homework	10%

Extra Credit: Here's a list of all the extra credit that will be available. Other extra credit assignments may be set.

Extra Credit Assignment	Worth this much on top of the 100% class grade
Introduce yourself during office hours during the weeks two and three	1%
Complete both the pre- and post-physics identity survey and concept test	2%
Anyone who points out an error I make in class, in the videos or at any other time, related to content or skills/processes gets	0.3%

Note that the official gradebook is on MyLeoOnline, NOT MasteringPhysics.

Grading scale: (**NOTE:** Grades are not curved in this class – what you get is what you get!)

90 % < A

Syllabus/schedule subject to change

80 % < B < 89.9999 %
70 % < C < 79.9999 %
60 % < D < 69.9999 %
F < 60%

Homeworks with deadlines

MasteringPhysics Homework: about 10 homework assignments will be assigned throughout the semester. Homework will be submitted through the MasteringPhysics online homework system. The due date will be displayed in MasteringPhysics and announced in class. The MasteringPhysics homeworks will be due **every Sunday at 11.59pm.**

Problem solving write-up: **Due every Monday at start of class**.

Tutorial homeworks: **Due Wednesdays at the start of class.** About 8 tutorial homework assignments will be assigned, and will assess conceptual understanding. You grade will be a 0,1, or 2 on each section of the homework according to the standards based assessment.

Most Days:

MyLeo Online Quizzes: When reading or lecture videos are assigned, there will also be a quiz in MyLeoOnline that you need to complete *before* class. These are intended to give you immediate feedback on your learning of the concepts. Completing these contribute to extra credit.

Class check –in/out questions: Sometimes there will also be class check-in or out questions – 5-10 minute questions that you complete at the beginning or end of class that cover material you have been working on that day or the previous class. Completing these contribute to extra credit.

Classwork: Another major way you will practice the content and skills is within class, solving a variety of problems with group mates. I'll talk now about how that works

WHAT HAPPENS IN *CLASS*

This class is being taught in studio mode. Studio mode is a student-centered active learning environment that concentrates on group work. A good analogy is with a sports coach: you can't learn a sport from sitting in lecture – only by practicing it yourself with a coach present to give you instruction and feedback. Physics is no different – you can only learn by doing. The majority of class time will be focused on group activities. Activities will include conceptual work, labs, and problem solving. Activities will be completed in groups of 3-4. The instructor will assign groups. Groups will be

changed up to 3-4 times during the semester. The instructor, learning assistant and graduate assistant will go from table to table, frequently sitting and observing your discussion. Our role is to help you ask the right questions that lead to you solving the problems yourselves.

There will be no in-class lectures. I will record lectures and put them online for you to view before class. You can then take notes in your own time, and replay as required.

Physics education research has shown that students learn best when actively engaged in class. Studio mode has been implemented at many universities and has been found to have positive impacts on conceptual understanding and problem-solving ability.

Each unit has a set of group work skills in the standards. These are assessed by the instructors (myself, the GA and LAs) across each unit.

HOW TO STUDY

Most students don't yet know the most effective way to study. There is a one-line summary for how to approach studying:

Study like you are going to have to teach the material.

The study skills you need to enquire have a fancy name: Metacognition.

Metacognition
The ability to:

- think about thinking
- be consciously aware of oneself as a problem solver
- to monitor and control one's mental processing
- to be aware of the type of learning that you are doing

In the study sequence below, the points in red are examples of metacognition! I will give you regular surveys on how you think you're doing in class, which includes opportunities to give feedback on the class. You will get extra credit for completing these surveys.

STUDY SEQUENCE

You will need a dedicated notebook to take notes for this class; make sure you always bring it to class.

If you regularly follow most of the following sequence before and after each class, it will become part of a routine. A similar routine is the best way to approach all classes! You'll need a total of 12-15 hours each week outside of class devoted to this. It works much better if you do a little bit each day (it works out to 1-2 hours each day outside of class, or about 3 – 3.5 hours every day you don't have this class).

Before each class reading or lectures are assigned (every 2-3 classes) – prepare (3 hours)

1. ***Preview – ½ hour***
Preview the relevant section of the relevant chapter of the textbook:
- note down what appear to be the big concepts, the main laws/definitions/terms/equations that the book emphasizes
- try and sketch and how these concepts and terms appear to fit together

2. ***Lecture*** - ***1 hour***
Watch the assigned video lectures. Make notes and try and connect the lecture material with you notes from the textbook preview. Make notes of anything you feel you don't understand.

3. ***Read the relevant section of the textbook again more thoroughly, and revisit any sections of the lecture – 1 hour***
- Read 1-2 paragraphs
- Summarize in your own words in your notes
- Re-read those paragraphs and then the next 1-2
- Summarize again
- Continue until you've finished.
- Connect your summary with the main points from you preview, and with the lecture
- If necessary, revisit parts of the lecture again
- Try and write down the main concepts, numbers, definitions, equations and categorize them ready to put on your flashcards.

4. ***Take the quiz – ½ hour***
- Note any questions that arise when taking the quiz. If you get any questions wrong, try and analyze where your understanding of the subject is incomplete.

5. ***Prepare specific questions for the class – 15 minutes***
- on a scrap piece of paper, put in the questions box at the start of class.

6. ***The whole time, ask yourself:***
ARE YOU UNDERSTANDING THE CONCEPTS?
DO YOU UNDERSTAND HOW IT ALL FITS INTO THE BIG PICTURE?
ARE YOU IMPROVING THE SKILLS NECESSARY TO IMPLEMENT THE CONCEPTS?
HOW DO YOU KNOW YOU ARE UNDERSTANDING CONCEPTS AND IMPROVING SKILLS?

During each class

You will practice you understanding by doing a variety of activities on your own and in collaboration with your group members:
- On your own, you will complete check-in and check-out questions, and every 2-3 weeks you will take a test
- In your groups, you will work through tutorials, group problems and the occasional lab
- Try explaining concepts to LAs, GA, the instructor, your group mates.
- TAKE NOTES!

After each class – 2 hours

Everything you do in class will give you feedback on how well you are understanding the subject and how you mathematical and conceptual skills are progressing.

1. ***Review what you did in class to get a good idea of how your skills and understanding are progressing – 1 ½ hours***
- Review the check in and out questions – Did you get them correct? If not, why not?
- How did you participate in group discussions? Did you feel like you contributed? How can you improve your participation? Did you follow everything you did in your group?
- How well were you able to explain material to you group mates? To the LA/GA? To the instructor? What did it reveal about your understanding and skills?
- Review the tutorial: could you correctly work through the tutorial on your own if asked to (and you might be asked to on tests!)
- Review the group problems: could you do them again on your own? Try!
- How did the check-in/out questions, tutorial, group problems or lab connect to the material you read in the textbook, and watched in the lectures.
- Add the above to your notes!

2. ***Re-read the relevant sections of the textbook – ½ hour***

- Make a note of how your understanding has changed since the last time you read the sections.

3. ***Again, the whole time, ask yourself:***
ARE YOU UNDERSTANDING THE CONCEPTS?
DO YOU UNDERSTAND HOW IT ALL FITS INTO THE BIG PICTURE?
ARE YOU IMPROVING THE SKILLS NECESSARY TO IMPLEMENT THE CONCEPTS?
HOW DO YOU KNOW YOU ARE UNDERSTANDING CONCEPTS AND IMPROVING SKILLS?

Each week (about 3-4 hours),

1. *Complete any tutorial homeworks as they are assigned*
2. *Complete the Mastering Physics*
3. *Complete any group problem write-ups assigned*
- For each of these: Try and estimate what grade you'll get. Do you feel like you're understanding the material? How confident are you about your estimated grade? If you're not that confident, you need to improve your study skills.

4. ***Again, the whole time, ask yourself:***
ARE YOU UNDERSTANDING THE CONCEPTS?
DO YOU UNDERSTAND HOW IT ALL FITS INTO THE BIG PICTURE?
ARE YOU IMPROVING THE SKILLS NECESSARY TO IMPLEMENT THE CONCEPTS?
HOW DO YOU KNOW YOU ARE UNDERSTANDING CONCEPTS AND IMPROVING SKILLS?

And all the time:

1. *Ask yourself if you're getting the help you need. Are you going to office hours? Are you going to the JAMP room? Are you asking for tutorial sessions with the LAs? If not, why not? What can you do to get more help?*

2. ***I can't stress this enough, the whole time, ask yourself:***
ARE YOU UNDERSTANDING THE CONCEPTS?
DO YOU UNDERSTAND HOW IT ALL FITS INTO THE BIG PICTURE?
ARE YOU IMPROVING THE SKILLS NECESSARY TO IMPLEMENT THE CONCEPTS?
HOW DO YOU KNOW YOU ARE UNDERSTANDING CONCEPTS AND IMPROVING SKILLS?

A note on reading the textbook: Many students take the wrong approach to reading textbooks; they try and read and understand every word, refuse to move on until they've understood everything in the present section, refuse to skip passages, and only read the material once. Reading textbooks is a skill: here is one of several good websites with instruction on how to acquire that skill.

http://www.dartmouth.edu/~acskills/success/reading.html

When reading textbooks, the aim is not to understand everything right away. You will likely need to read the chapters several times before and after covering the material in class to really feel like you're getting the material (I always had to read textbooks half a dozen times for the content to begin to sink in). The first time you read the chapter, you should skim it (this is the "preview" read discussed in the above website). Let the reading quiz guide you and try and pick up what are the major concepts, equations, and laws you are required to understand to answer problems. After we cover a chapter in class, you can re-read the chapter and pick up on the things you missed/didn't understand the first time through. Bear in mind that the textbook now fills the role of much of the traditional lecture.

WHY I DESIGN THE CLASS LIKE THIS

TLDR: You might ask what the point of setting the class up like this is. Some of the activities will probably push you out of your comfort zone, and you may not think things are working for you. I'm always receptive to *constructive* criticism, and am always happy to talk through any problems you have. But here I will outline the reasons for designing the class like this:

1. The skills I'm emphasizing are the skills employees most say we need to do a better job at preparing students with, in particular **group work, adaptability to new ways of working** and **metacognitive skills** come up time and again in surveys of skills employers in industry, academia, and finance want to see more of. We have an advisory board of ex-students from A&M-Commerce Physics department who now work as teachers, in industry, and in academia, who agree.

2. The design of this course is evidence based. All evidence from the scientific measurement of the outcomes of student learning show that the best environment to teach is one where students actively participate in solving problems, with the instructor, GA and LAs in the role of coaches, and one in which students are encouraged and given the tools to take control and responsibility for their own learning.

A MORE DETAILED EXPLANATION

Course Design and Critical Thinking (Problem Solving) Skills

I'll just take a moment to explain the reason why we teach the class in so-called studio mode. Many students who take this course will not pursue advanced physics degrees (although some will) and many of you will not often directly use most of the physics concepts taught in the course in your careers. But what you *will* use is your ability to be able to analyze a problem using multiple methods – qualitatlively, conceptually, quantitatively - to simplify it to its fundamental essence to solve it, then systematically add more complexities until you've solved your original problem. No matter what your eventual career, this is what you will be doing, and is what employers are looking for. Employers consistently rank critical thinking and problem-solving ability near the top of their list of desired traits in valued employees. We have redesigned the course to focus on these universal skills; as a bonus, research has shown that focussing on such skills leads to greater conceptual understanding in physics! In Bloom's taxonomy of cognitive skills, this class focusses the 3 higher-level thinking skills highlighted below.

Bloom's Taxonomy of the Cognitive Domain:

1. **Knowledge** - memorization of facts, words, and symbols
2. **Comprehension** - understanding the meaning of knowledge
3. **Application** - applying concepts to various situations
4. **Analysis** - breaking apart complex ideas
5. **Synthesis** - putting individual ideas together to form a complete explanation
6. **Evaluation** - judging the merits of individual ideas and making decisions

Memorization of equations and rote problem solving will not get you very far in this class. In tutorials, group problems, and on a lot of test questions, only about 50% of the points on offer go for picking the right equation, plugging in numbers and getting the right answer. You will have to demonstrate understanding: explain what answer you expect before solving the problem, drawing clear and fully labeled diagrams, explaining things using graphs, and justifying your answers. These are skills we will practice all the time in class, and you will be required to use them on tests. The class period is the time when you should be using the LA, GA and myself to acquire these skills.

And that is what this class is about: acquiring skills. And just like in sports, for example, you can't learn skills by someone getting up and lecturing to you. You only acquire skills by practicing them time and again under the guidance of a coach. In this class, you will practice by working on problems – many of them – and the LA, GA and myself are your coaches.

WHERE TO GET HELP

I want to make this class accessible to everyone, and make sure everyone is included. Everyone in this class has the ability to get an A. However, not everyone is starting from the same point. Some of you come from high school with great physics teachers and a lot of funding – you've had AP physics and calculus and are very well prepared. Many of you don't have this background at all. You may be in a group with someone that does, and they're "getting it" quickly while you're still struggling. This doesn't mean that the other person is innately talented and you are not – in most cases it just means that they have spent more time doing math and physics in the past than you have. You can do it – you just need to put in the time. This "genius" narrative – mistaking background for ability – can particularly negatively affect women and underrepresented minorities due to existing stereotypes about these groups. In studio physics, we are hoping you will feel proud about yourself and your accomplishments. You can feel ownership for your contributions to your group; proud of your improvement; proud of challenging yourself; proud of your ability to discuss physics concepts with others, and more. Want to read more about this? Follow this link: http://www.aas.org/cswa/status/status_2015jun.pdf and read the essay on page 7 by Dr. Angela Little.

Finding Help

The **class period** is intended to be the time when you acquire *understanding*. The laws and equations you can read in the textbook; in the class you will learn the skills to apply them to problems and assess your answers. You will acquire these skills by actively working in groups to work through tutorials and solve problems. You will be learning from your group mates, from our Learning Assistant and Graduate Teaching Assistant, and from myself.

Outside of class, you are encouraged to come to office hours for help on any aspect of the course. Also, our Learning Assistants and Graduate Assistant are happy to help – just talk to them after class, email them, or head down to the Physics Lounge (room 111) where other physics students are happy to help.

A note about asking questions: Just because you read the textbook and work the problems doesn't mean you'll understand the material completely. You will frequently have questions to ask my LAs, GAs and I. If you have done sufficient reading and working on the subject, you will be able to ask very specific questions that we can help you with. For example:

Do ask questions like "I don't understand how to choose the variable to integrate over when applying Coulomb's law to calculating the electric field of extended charge distributions"

Do not ask questions like "I don't get Coulomb's law. What is it?"

The latter question tells me you haven't put any effort into understanding the material, and is too vague for me to answer.

To succeed in this class

The biggest predictor for success in this (and any) class is the time, thoroughness, and effort you put into the work and reading set. The harder you work, the better you'll do. Therefore you need to aim to

- Attend all classes, and participate fully in group work
- Complete and turn in all the work on time
- Read the textbook thoroughly, in the most efficacious way (see above)
- Take advantage of all the extra credit
- Ask for help when needed, and make sure you questions are specific
- Follow the study schedule
- Practice metacognitive skills

Student Responsibilities

The vast majority of class time will be spent working in groups. Students are expected to participate fully in group-work and work to include others in their group in the problem solving and conversations that occur.

Students are expected to have completed readings and watched videos by the due date, and completed any quizzes based on the reading and videos.

Students are expected to take notes on all problems you solve in class, any notes shared by other groups on whiteboards. For work displayed on whiteboards, the easiest thing to do is to just take photos of the work using camera phones *but you should also write notes later based on* those *pictures.* Research shows that students retain knowledge best when they

hand-write notes rather than just take photos or do nothing at all, as it forces you to organize information in your mind, which forces you to understand the meaning of the information you're being presented.

All students are expected to complete the tutorial worksheets; although the in-class tutorials are not graded, you will need complete worksheets to do the tutorial homework and to revise for the exams.

TECHNOLOGY REQUIREMENTS

In order to access the MasteringPhysics online homework system, you will need access to the internet and a web browser. All lectures will be posted online on the MasteringPhysics website.

- To fully participate in online courses, you will need to use a current, Flash enabled browser. For PC users, the suggested browser is Internet Explorer 9.0 or 10. For Mac users, the most current update of Firefox is suggested.

- You will need regular access to a computer with a broadband Internet connection. The minimum computer requirements are:
    - 512 MB of RAM, 1 GB or more preferred
    - Broadband connection required courses are heavily video intensive
    - Video display capable of high-color 16-bit display 1024 x 768 or higher resolution

- You must have a:
    - sound card, which is usually integrated into your desktop or laptop computer
    - speakers or headphones.

- Depending on your course, you might also need a:
    - webcam
    - microphone

  For courses where interactive tools are used, like VoiceThread or Class Live Pro, headphones are suggested for use with recording and playback. We recommend a webcam with an integrated microphone, such as the Microsoft LifeCam Cinema. All devices should be installed and configured before class begins.

- Both versions of Java (32 bit and 64 bit) must be installed and up to date on your machine. Java can be downloaded at: http://www.java.com/en/download/manual.jsp

- Current anti-virus software must be installed and kept up to date.

- You will need some additional free software for enhanced web browsing. Ensure that you download the free versions of the following software:
    - Adobe Reader
    - Adobe Flash Player

- At a minimum, you must have Microsoft Office 2013, 2010, 2007 or Open Office. Microsoft Office is the standard office productivity software utilized by faculty, students, and staff. Microsoft Word is the standard word processing software, Microsoft Excel is the standard spreadsheet software, and Microsoft PowerPoint is the standard presentation software. Copying and pasting, along with attaching/uploading documents for assignment submission, will also be required. If you do not have Microsoft Office, you can check with the bookstore to see if they have any student copies.

- For additional information about system requirements, please see: https://secure.ecollege.com/tamuc/index.learn?action=technical

- If you use a camera phone to take pictures of your work, a useful app is CamScanner (https://www.camscanner.com), which compiles multiple pictures into one document for ease of uploading. There is a free version that I encourage you to check out.

MyLeo Online/D2L

Browser support

D2L is committed to performing key application testing when new browser versions are released. New and updated functionality is also tested against the latest version of supported browsers. However, due to the frequency of some browser releases, D2L cannot guarantee that each browser version will perform as expected. If you encounter any issues with any of the browser versions listed in the tables below, contact D2L

Support, who will determine the best course of action for resolution. Reported issues are prioritized by supported browsers and then maintenance browsers.

Supported browsers are the latest or most recent browser versions that are tested against new versions of D2L products. Customers can report problems and receive support for issues. For an optimal experience, D2L recommends using supported browsers with D2L products.

Maintenance browsers are older browser versions that are not tested extensively against new versions of D2L products. Customers can still report problems and receive support for critical issues; however, D2L does not guarantee all issues will be addressed. A maintenance browser becomes officially unsupported after one year.

Note the following:

- Ensure that your browser has JavaScript and Cookies enabled.
- For desktop systems, you must have Adobe Flash Player 10.1 or greater.
- The Brightspace Support features are now optimized for production environments when using the Google Chrome browser, Apple Safari browser, Microsoft Edge browser, Microsoft Internet Explorer browser, and Mozilla Firefox browsers.

Desktop Support

Browser	Supported Browser Version(s)	Maintenance Browser Version(s)
Microsoft® Edge	Latest	N/A
Microsoft® Internet Explorer®	N/A	11
Mozilla® Firefox®	Latest, ESR	N/A
Google® Chrome™	Latest	N/A
Apple® Safari®	Latest	N/A

Tablet and Mobile Support

Device	Operating System	Browser	Supported Browser Version(s)
Android™	Android 4.4+	Chrome	Latest

Device	Operating System	Browser	Supported Browser Version(s)
Apple	iOS®	Safari, Chrome	The current major version of iOS (the latest minor or **point** release of that major version) and the previous major version of iOS (the latest minor or **point** release of that major version). For example, as of June 7, 2017, D2Lsupports iOS 10.3.2 and iOS 9.3.5, but not iOS 10.2.1, 9.0.2, or any other version. Chrome: Latest version for the iOS browser.
Windows	Windows 10	Edge, Chrome, Firefox	Latest of all browsers, and Firefox ESR.

- You will need regular access to a computer with a broadband Internet connection. The minimum computer requirements are:
    - 512 MB of RAM, 1 GB or more preferred
    - Broadband connection required courses are heavily video intensive
    - Video display capable of high-color 16-bit display 1024 x 768 or higher resolution

- You must have a:
    - Sound card, which is usually integrated into your desktop or laptop computer
    - Speakers or headphones.
    - *For courses utilizing video-conferencing tools and/or an online proctoring solution, a webcam and microphone are required.

- Both versions of Java (32 bit and 64 bit) must be installed and up to date on your machine. At a minimum Java 7, update 51, is required to support the learning management system. The most current version of Java can be downloaded at: JAVA web site http://www.java.com/en/download/manual.jsp

- Current anti-virus software must be installed and kept up to date.

Running the browser check will ensure your internet browser is supported.

Pop-ups are allowed.
JavaScript is enabled.
Cookies are enabled.

- You will need some additional free software (plug-ins) for enhanced web browsing. Ensure that you download the free versions of the following software:
  - Adobe Reader https://get.adobe.com/reader/
  - Adobe Flash Player *(version 17 or later)* https://get.adobe.com/flashplayer/
  - Adobe Shockwave Player https://get.adobe.com/shockwave/
  - Apple Quick Time http://www.apple.com/quicktime/download/

- At a minimum, you must have Microsoft Office 2013, 2010, 2007 or Open Office. Microsoft Office is the standard office productivity software utilized by faculty, students, and staff. Microsoft Word is the standard word processing software, Microsoft Excel is the standard spreadsheet software, and Microsoft PowerPoint is the standard presentation software. Copying and pasting, along with attaching/uploading documents for assignment submission, will also be required. If you do not have Microsoft Office, you can check with the bookstore to see if they have any student copies.

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu**.**

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

D2L COMMUNICATION AND SUPPORT

Brightspace Support

Need Help?

Student Support

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778 or click on the **Live Chat** or click on the words "click here" to submit an issue via email.

System Maintenance

D2L runs monthly updates during the last week of the month, usually on Wednesday. The system should remain up during this time unless otherwise specified in an announcement. You may experience minimal impacts to performance and/or look and feel of the environment.

CLASS COMMUNICATION AND SUPPORT

The following is the list of communication methods used in this class and their purposes. These include student-instructor, instructor-student and student-student communication.

You will be expected to check your university email account at least once every 48 in order to keep abreast of the latest class announcements.

- **Email** will be used by me to communicate to the class as a whole general information about upcoming assignments, due dates, and any changes in the schedule or syllabus that might occur.

  I will also email students individually with occasional feedback from assignments and on the class as a whole.

  Students can use email to ask me any questions about (i) course logistics (upcoming assignments, due dates...) (ii) as any questions about the way their specific assignments were graded and feedback they have been given (iii) constructive feedback to me about how the

course is going and any problems/concerns with the course structure (and even things that work particularly well!)

In emails, please put "PHYS2426 Online" in the subject header. I will reply to emails within 24 hours (48 at weekends and holidays)

I will always send emails to your official University Email address as given through MyLeo. It will be your responsibility to check your university email regularly.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. (See current Student Guidebook*).*
Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: Netiquette http://www.albion.com/netiquette/corerules.html

Academic Honesty.

1. "All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment." (See Student's Guide Handbook, Policies and Procedures, Conduct). Ethics also includes the issue of plagiarism, and copying code for programming/lab assignments is just as serious as any other type of plagiarism. If you are caught sharing or using other people's work in this class, you will receive a 0 grade and a warning on the first instance. A subsequent instance will result in receiving an F grade for the course, and possible disciplinary proceedings. Online tutoring services like **Chegg** are useful resources, but using them on exams is considered cheating and will be subject to the same rules as plagiarism. I monitor **Chegg** regularly for exam questions or other homework questions from my class.

Other class policies

1. Cell phone use is only allowed if used for class activities.

2. **Eating is not allowed**. However, covered drinks are allowed.

3. Attendance will be taken by seating chart at the beginning of class.

4. The instructor must be notified by email about any excused absences **no later than 24 hours after the missed class**. Even if you choose to notify the instructor in person, you **must still follow up with email** within 24 hours of the missed class. If you do not follow this policy, you will not be able to make up missed exams or turn in late work except in extreme circumstances. Excused absences include those for illness, school-sponsored events, other emergencies deemed unavoidable by the instructor.

5. You are responsible for obtaining notes and class announcements from missed classes.

6. Excessive absences may result in being dropped from the course.

7. When emailing the instructor, include the **course and section number in the subject line**. Include all relevant information, and write clearly, and double check your email to make sure grammar and spelling are correct (this is good advice beyond college: if you email prospective employers, and include poor spelling and bad grammar, they are unlikely to give you the time of day - get in the habit now, when the stakes are not as high).

9. You are expected to check your email at least once a day for class announcements. ***Emails will be sent to your university (leomail) addresses.*** Notify the instructor if you would prefer to receive emails at a different address.

11. Students should fully participate in class activities.

12. Students are expected to be professional and respectful and take responsibility for their learning. If you find yourself struggling, the instructor, GA and LAs are available to provide extra help outside of class.

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

ADA Statement

Students with Disabilities

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students

with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
Texas A&M University-Commerce
Gee Library- Room 132
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: Rebecca.Tuerk@tamuc.edu

Website: Office of Student Disability Resources and Services
http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/

Nondiscrimination Notice
Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorize the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations. For a list of locations, please refer to:

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

and/or consult your event organizer). Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

LIFE CAN BE HARD – HERE'S WHERE TO GET HELP

Mental health issues

Counseling is available to all students for free.

Call or drop by in-person to make an appointment
Halladay Student Serv. #204
903-886-5145

Student conduct issues

If you believe a student has violated the code of conduct, you can report it here: https://bit.ly/33WRMOK

Violations of the code of conduct include altercations, disorderly conduct, disruptive activity, discrimination, and sexual harassment.

Student of concern/distress

If there is a student you are concerned about for reasons such as threatening behavior, talk of suicide, or homelessness, you can report those concerns using the CARE Report Form:

https://bit.ly/35VC5cf

Concerns about the university
You can report any concerns you have about the university to:
StudentConcern@tamuc.edu
The Student Concern form is available at: https://bit.ly/33Qv1f9

Title IX: Sexual harassment and assault

If you have experienced or are aware of sexual harassment, sexual misconduct, domestic violence, dating violence, or stalking, you can report this to the Title IX office.

TitleIX@tamuc.edu
McDowell Administration (BA) Building 259
903-468-3104

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, etc. If you or someone you know has been harassed or assaulted, you can find the additional resources here:

Campus police: mailto:upd@tamuc.edu, call 911 in emergency situations
SAFE Team: https://www.tamuc.edu/CampusLife/Victim Advocacy and Support/
Crisis center of NorthEast Texas: http://www.ccnetx.org
Know your IX: http://knowyourix.org
End rape on campus: http://endrapeoncampus.org
Clery Center for Security on Campus: http://clerycenter.org
Not Alone: https://www.notalone.gov

Don't know where to go?

If you need help and you do not know where to go, Campus Life and Student Development can direct you to the most relevant office.

Campuslife@tamuc.edu
Halladay 201
903-886-5195

COURSE OUTLINE / CALENDAR

This schedule is intended as a rough guide only, and WILL change; all due dates will be announced in class several times and over email.

Date	Topic	Chapter (4^{th} edition)
M Jan 13	Introduction: Vector Addition Warm up	
W Jan 15	Introduction: Order of Magnitude estimates	
F Jan 17	Introduction: Phys 1 Recap/ Notecards/Landscape of Physics – the force picture	
M Jan 20	MLK DAY – NO CLASS	
W Jan 22	Charge and charge diagrams	22.1-22.4/13.1-13.3
F Jan 24	Electric charge, gravitational mass and forces in 1d	22.1-22.4/13.1-13.3
M Jan 27	Electric charge, gravitational mass and forces in 1d	22.1-22.4/13.1-13.3
W Jan 29	Electric charge, gravitational mass and forces in 2d	22.1-22.4/13.1-13.3
F Jan 31	Electric gravitational forces plus other forces/circular motion	22.1-22.4/ 13.6
M Feb 3	**TEST 1**	
W Feb 5	Electric gravitational forces plus other forces/circular motion	22.1-22.4/13.1-13.3, 13.6
F Feb 7	The Energy Picture	13.5,25.1-25.2
M Feb 10	Electric and gravitational potential energy	13.5,25.1-25.2
W Feb 12	Electric and gravitational potential energy	13.5,25.1-25.2
F Feb 14	Electric and gravitational potential energy	13.5,25.1-25.2
M Feb 17	**TEST 2**	
W Feb 19	Electric and gravitational force fields	13.4,22.5,23.1-23.2
F Feb 21	Electric and gravitational force fields	13.4,22.5,23.1-23.2

Syllabus/schedule subject to change

M Feb 24	Magnetic Fields	29.1-29.3
W Feb 26	Magnetic fields	29.1-29.3
F Feb 28	Forces from fields	23.6,29.3,29.7
M Mar 2	Potential fields	25.4,25.6,25.7
W Mar 4	Potential Fields	25.4,25.6,25.7
F Mar 6	**TEST 3**	
M Mar 9		
W Mar 11	**SPRING BREAK**	
F Mar 13		
M Mar 16	Electric dipole	23.2,25.3
W Mar 18	Fields of multiple point charges/masses	23.2
F Mar 20	Fields of multiple point charges/masses	23.2
M Mar 23	Charge and mass densities	23.3-23.5
W Mar 25	Currents	27.1-27.4,29.4
F Mar 27	Force Fields of continuous charge, mass, current distributions	23.3-23.5,29.4-29.5
M Mar 30	Force Fields of continuous charge, mass, current distributions	23.3-23.5,29.4-29.5
W Apr 1	Potential Fields of continuous charge, mass, current distributions	25.7
F Apr 3	Potential Fields of continuous charge, mass, current distributions	25.7
M Apr 6	**TEST 4**	
W Apr 8	Connection between potential and force fields	26.1-26.3
F Apr 10	Connection between potential and force fields	26.1-26.3
M Apr 13	Batteries	26.4
W Apr 15	Capacitors	26.5-26.6

Syllabus/schedule subject to change

F Apr 17	Capacitors in circuits	26.5
M Apr 20	**TEST 5**	
W Apr 22	Resistors	27.4-27.5
F Apr 24	Resistors in circuits	28
M Apr 27	Resistors in circuits	28
W Apr 29	Resistors in circuits	28
F May 1	Resistors in circuits	28
M May 4	**FINAL 1:15 pm – 3:15pm**	