PHYS 2426.002 20826
University Physics II: Electricity and Magnetism
COURSE SYLLABUS: SPRING 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 – 4:00pm, STC 135
Office Hours: MW 12:45pm-1:45pm, F 1-1:45pm or by appointment
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Preferred Form of Communication: Office visit, email, chat after class!
Communication Response Time: 24 hours

Syllabus/schedule subject to change

COURSE INFORMATION

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.

PHYS 2426 Lab Manual, available at the campus bookstore

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.

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.

Student Learning Outcomes

Students will be able to demonstrate the following skills when analyzing situations involving electrostatic fields and potentials and their sources, currents, voltage, capacitance, power, basic electrical circuits, magnetic fields and their sources, and induction:

1. Students will be able to conduct qualitative analysis of electromagnetism problems which demonstrates conceptual understanding as measured by performance in visualizing problems through diagrams, estimating answers, assessing and justifying answers, analyzing graphs and clear, written explanations..
2. Students will be able to perform quantitative calculations in situations involving electric and magnetic fields, and demonstrate knowledge of the relevant basic units, vector addition, and application of basic calculus. Students will be able to assess answers to questions for plausibility.

3. Students will be able to use simple laboratory demonstrations, computer simulations and computational tools to explain the basic properties of electric and magnetic fields, and electrical circuits.

SKILLS THAT WILL BE EMPHASIZED

The following skills will be required to do well in this class. You will be asked to practice them continually in class (like players in a sports team practice their skills several times a week in training sessions), and you will be asked to display these skills repeatedly throughout the semester on homeworks and exams.

Algebra – solving problems algebraically (i.e. without plugging in any numbers). Being able to manipulate expressions algebraically (re-arrange equations to solve for certain quantities)
Vector Addition – You will be asked to add together vectors and express the resultant in unit vector notation and as a magnitude and direction (and understand what they mean) *all the time.*
Proportional reasoning – One of the most useful skills in physics, this will save you *so* much work, and I will ask you to do it *all the time* (there's a theme here). If you're not sure what it is, look it up using the Googles; we'll very quickly come to talk about it in class.
Calculus – Setting up and doing integrals, and more importantly know what they mean, is going to be very important. Ordinary differentiation will be very important to, and partial differentiation will rear its head about half way through the semester.
Order of magnitude estimation/evaluation – One of the most important skills in all subjects is, when you solve a problem, being able to assess whether you got it right. Often this means having an idea of that the answer should be (to within a power of 10). In this class, solving a problem is not going to be enough – you will need to convince me you got it right.
Drawing good pictures/diagrams – one of the most basic skills: drawing a *clear, big* diagram to represent what's going on in a problem, and labeling every single quantity that's relevant.
The big picture – understanding how everything you learn fits into the big picture of physics. Physics is like a city – all the concepts belong somewhere on the city map, and are connected to each other. You need to see the big picture, the overall structure of the subject, to truly understand it.
Chains of reasoning – When you do a physics problem, what you're doing is starting somewhere on your city map and following a route to an end point. If you see all physics problems as simply navigating slightly different routes on the map, then things become much more straightforward. Each route is a chain of reasoning.

And finally, a more general, vitally important learning skill:

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!

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 homework by each Friday and any follow up work*
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?

COURSE REQUIREMENTS/INFORMATION

Instructional Methods

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. There will be in-class quizzes to test the material in the lectures, and these will count towards your grade.

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.

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.

Class sequence:

The subject matter is divided up into a sequence of 10 topics, each addressed by 1 chapter in the textbook *Physics for Scientists and Engineers*. We will spend about 4 class periods on each topic.

You should make every effort to follow the study schedule outlined in the previous section. You will need to read the chapter and watch the lectures before we cover the material in class. To encourage you to do this, you will be required to complete online reading quizzes by 11.59pm the night before we begin to cover the material in class, and there will be in-class quizzes over the lectures. I will announce in class when each new reading quiz is available, and when it is due. These quizzes count towards your final grade.

Out of the 4 classes we spend on each chapter, approximately two classes will be spent on mini-lectures and group problem solving, one class on a tutorial from the "*Tutorials in Introductory Physics*" workbook, and one on a lab/PhET simulation/real-world problem(s).

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.

A note on "physics is hard": Yes, it is. It is for everyone, and it was for me (it was for Einstein, too). 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.

GRADING

Item	Percentage of Class Grade
Group problem write-ups (completed individually, about 1/week)	10%
MyLeo Online Quizzes/Class check-in and out questions/weekly metacognitive survey	12%
Tutorial Homeworks	14%
MasteringPhysics (Online) Homework + associated questions	12%
Midterm exams	40% (5 x 8%)
Final (Cumulative)	12%
Project:	

In addition, occasional extra credit assignments will be given, which will add up to no more than an extra 3%. The first small piece of extra credit will be given to any who come and introduce themselves to me during office hours during the first 2 weeks of classes. Your current grade at any time during the semester can be found in the gradebook in MyLeoOnline.

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

Assessments

See the course calendar at the end of this syllabus for a complete list of class and exam dates (note: these are estimates – the dates are likely to change), and the first few Mastering Physics homework due dates.

General: **The problem solving rubric** summarizes how I want you to approach all problem solving. **Keep a copy with you at all times.** In-class assignments, some homework problems, and some exam problems will be graded according to this rubric, and it is generally a good guide to approaching problem solving in college and beyond.

Exams: There will be five midterms and a final. See the course outline for *estimates* of exam dates. Make-up exams will only be allowed for excused absences. See course policies below for details on excused absences. During the exams you can use your phones, any notes you have, books, indeed any access you have to the entirety of human knowledge. However, you MUST bring the notecards of laws, definitions, skills, derived quantities and numbers. A calculator will be useful, though you don't need a graphing calculator (you can use one if you want), and simple calculators are available upon request.

ALL types of problems you encounter in class or on homework will be encountered on exams – everything you do is essentially practicing towards the exam. ***You should treat exams as feedback on how you're understanding the material.***

Exams will be graded in the following way: if you put together a string of exam scores such that each one improves on the previous, I will replace all exam scores in the sequence with the highest score from that sequence. If there are a couple of examples:

Example 1:
Your six exam scores are **44, 53, 71, 67, 82, 72**
I will replace them with **71, 71, 71, 82, 82, 72**

Example 2:
Your six exam scores are **84, 62, 72, 78, 79, 81**
I will replace them with **84, 81, 81, 81, 81, 81**

Example 3:
Your six exam scores are **63 62 55 48 48 92**
I will replace them with **63 62 55 92 92 92**

MasteringPhysics Homework: about 11 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 Friday at 11.59pm.** You will often be asked to write up one of the Mastering Physics questions according to the problem-solving rubric.

Most times, I will also require you to complete one of the Mastering Physics problems by hand according to the problem solving rubric and turn it in the following Monday, or turn in a chain of reasoning associated with one of the problems.

Syllabus/schedule subject to change

Tutorials Homework: About 10 homework assignments will be assigned throughout the semester from the, "*Tutorials in Introductory Physics"* homework book. Homework is due at the beginning of class. Late homework will not be accepted. Your lowest tutorial homework grade will be dropped. Tutorial homework will generally be due **two classes** after it is assigned. **NOTE:** Tutorial homework solutions are not distributed; questions that posed particular difficulty will be discussed in class (you are welcome to suggest questions to discuss). If you have questions about a particular solution, you should ask me during office hours. Tutorial homework is graded according to the rubric given at the end of the syllabus.

Group problem write-ups: At least once per week, a problem that you have solved in class with your group will be selected to write up individually according to the group problem-solving rubric.

MyLeo Online Quizzes/Class check –in/out questions/Other group work collected in for grading: When reading or lecture videos are assigned, there will also be a quiz in MyLeoOnline that you need to complete *before* class. 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. **If you miss the start or end of class, these check-in/out questions cannot be made up.** Finally, group work will occasionally be collected in and graded; either this will be in-class problem solving (graded according to the problem solving rubric at the end of the syllabus) or occasional lab worksheets (some of which will be graded according to the lab rubric given at the end of the syllabus) or some other worksheets. Assignments will be completed as a group, and each member will receive the group score.

Every grade counts – I will not drop the lowest in any category. **NOTE:** I do not distribute solutions to the in-class problems, so make sure you take notes as you are doing the problems, and when we discuss them afterwards. **NOTE II:** In-class assignments that you miss due to absences cannot be made up.

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.

Syllabus/schedule subject to change

- 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
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.

Device	Operating System	Browser	Supported Browser Version(s)
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

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.

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

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.

Harassment Policy

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 appropriate resources here:

University Title IX Contact: Michele Vieira, 903-886-5025, mailto:TitleIX@tamuc.edu

University resource webpages:
http://www.tamuc.edu/facultyStaffServices/humanResources/title-ix/resources.aspx

http://www.tamuc.edu/campuslife/campusServices/universityPoliceDepartment/crimePrevention/sexualAssault.aspx

University Counseling Center: 903-886-5145,
http://www.tamuc.edu/campusLife/campusServices/counselingCenter/default.aspx

Campus police: mailto:upd@tamuc.edu, call 911 in emergency situations

External resources:
Crisis center of NorthEast Texas: http://www.ccnetx.org
Know you 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

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.

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. Other than days of tests, you will always have a MasteringPhysics homework due each Friday at midnight.

Date	Topic	Homeworks/Reading/ Things to Remember	Chapter (3rd edition)	Chapter (4th edition)
M Jan 14	Introduction			
W Jan 16	Introduction			
F Jan 18	Introduction	Mastering Physics HW0 (Warm up) Deadline 11:59pm	25	22
M Jan 21	MLK DAY – NO CLASS		25	22
W Jan 23	Electric charge and forces		25	22
F Jan 25	Electric charge and forces	Mastering Physics HW1 Deadline 11:59pm Tutorial HW 1 Due in class	25	22
M Jan 28	Electric field (point charges)		25	22
W Jan 30	Electric field (point charges)		25	22
F Feb 1	**TEST 1**			
M Feb 4	Electric Field (multiple point charges)		26	23
W Feb 6	Electric Field (multiple point charges)		26	23
F Feb 8	Electric field (continuous	Mastering Physics HW2 Due 11:59pm	26	23

Syllabus/schedule subject to change

	charge distributions)			
M Feb 11	Electric field (continuous charge distributions)		26	23
W Feb 13	Electric field (continuous charge distributions)		26	23
F Feb 15	**TEST 2**			
M Feb 18	Flux and Gauss' Law		27	24
W Feb 20	Flux and Gauss' Law		27	24
F Feb 22	Flux and Gauss' Law	Mastering Physics HW3 Due 11:59pm	27	24
M Feb 25	Flux and Gauss' Law		27	24
W Feb 27	Electric Potential		28	25
F Mar 1	Electric Potential	Mastering Physics HW4 Due 11:59pm	28	25
M Mar 4	Electric Potential		28	25
W Mar 6	Electric Potential		28	25
F Mar 8	**TEST 3**			
M Mar 11	Potential and Field		29	26

Syllabus/schedule subject to change

W Mar 13	Potential and Field		29	26
F Mar 15	Potential and Field /Capacitance	Mastering Physics HW5 Due 11:59pm	29	26
M Mar 18	**SPRING BREAK**			
W Mar 20	**SPRING BREAK**			
F Mar 22	**SPRING BREAK**			
M Mar 25	Capacitance		29	26
W Mar 27	Current, Resistance, EMF		30	27
F Mar 29	Current, Resistance, EMF	Mastering Physics HW6 Due 11:59pm	30	27
M Apr 1	Capacitors in circuits		29	26
W Apr 3	**TEST 4**			
F Apr 5	DC Circuits	Mastering Physics HW7 Due 11:59pm	31	28
M Apr 8	DC Circuits		31	28
W Apr 10	DC Circuits		31	28
F Apr 12	DC Circuits	Mastering Physics HW8 Due 11:59pm	31	28
M Apr 15	**TEST 5**			

Syllabus/schedule subject to change

W Apr 17	Magnetic Fields and forces		32	29
F Apr 19	Magnetic Fields and forces		32	29
M Apr 22	Magnetic Fields and forces		32	29
W Apr 24	Magnetic Fields and forces		32	29
F Apr 26	Sources of magnetic field	Mastering Physics HW9 Due 11:59pm	32	29
M Apr 29	Sources of magnetic field		33	29
W May 1	Induction		34	30
F May 3	Induction	Mastering Physics HW10 Due 11:59pm	34	30
M May 6	**FINAL 1:15 pm – 3:15pm**			

Tutorial Homework Rubric

Each graded item on the assignment is worth 4 points total. The assignment of the 4 points is determined by the following rubric. An item is defined as an individual part of a question/problem, involving a sketch, written explanation or quantitative answer. The total possible score for an assignment will be determined by multiplying the number of items times 4. This score will then be converted to a percentage.

Points	2	1	0
Quality of written explanation OR sketch	The written explanation shows that the student has put in thought, and the reasoning is logical. OR The sketch shows that the student has put in thought, and the sketch is mostly correct.	The written explanation shows that the student has put in thought, but the reasoning makes little sense. OR The sketch shows that the student has put in thought, but the sketch is mostly incorrect.	Written explanation reflects minimal effort. OR Sketch reflects minimal effort.
Completeness	Response to question is complete. When a written explanation is required, complete sentences are used.	Response to question is incomplete. When a written explanation is required, complete sentences are not used. Much of the writing is unreadable, word choice is inaccurate, and errors severely impede communication.	There is no response.