“The detailed schedule will be provided in CANVAS before the first day of classes. As the instructor for this course, I reserve the right to adjust the schedule in any way that serves the educational needs of the students enrolled in this course. Alex Weiss

2212 Physics 1444-002: General technical Physics II
Spring 2021

Instructor Information

Instructor(s)
Alex Weiss

Office Number
SCI 108 (Office hours will be fully online via TEAMS)

Office Telephone Number
817 272 2266

Email Address
weiss@uta.edu

Faculty Profile
https://mentis.uta.edu/explore/profile/alexander-weiss

Office Hours (Virtual-Via TEAMS)
Monday Wednesday 2:30 PM to 3:00PM or by appointment.

Course Information

Section Information
2212-PHYS-1444-002

Time and Place of Class Meetings
Monday-Wednesday 1:00 pm to 2:20 PM (ONLINE through CANVAS or TEAMS if some problems)

Due to the recent events, this course is delivered **fully online synchronously** (Fully Online Option 2). The instructor will primarily use CANVAS conference for the online course delivery and all the students will be invited to the conference ahead of time. **Please adjust your CANVAS settings to receive the announcements immediately through email.** If there is a technical requirement (for example, CANVAS being inaccessible or down) the course may also be delivered through Microsoft Teams. All the students will also be made part of the Microsoft Teams account and class information will be given ahead of time. **Remember all instruction, activities and testing are online but optional online quizzes require synchronous class attendance or participation on dates specified in syllabus. The quizzes are optional but have been shown to greatly increase the grade of the students.**

Description of Course Content
The second half of a one-year technical course. It is required for many science and engineering majors and exceeds premedical requirement. The course involves the study electricity, magnetism, circuit theory, light and optics. Prerequisites: (1) PHYS 1443 or equivalent and (2) MATH 2425 or concurrent enrollment. The course is supplemented by laboratory experiments.
General Outline of Course:

1. Electrostatics
   - Electric charges, Electric field, Coulomb’s Law
   - Gauss’s Law and applications
   - Electric potential and potential energy
   - Energy storage using Capacitors and Capacitance
2. Electricity
   - Electric Current and Resistance
   - DC Circuits and Analysis
3. Magnetostatics
   - Magnetism and magnetic fields
   - Force on a charged particle and current carrying conductor in magnetic fields
   - Biot-Savart’s law and Ampere’s Law
4. Electromagnetic Induction
   - Faraday’s Law
   - Lenz’s Law
   - Inductance
5. AC circuits
   - RL, LC and LRC circuits
   - Simple AC circuits and resonance
6. Electromagnetic Waves
   - Maxwell’s equations
   - Electromagnetic waves
7. Light
   - Reflection
   - Refraction, Snell’s Law
   - Lenses and Optical instruments
8. Light: Wave nature
   - Interference
   - Diffraction
   - Polarization
9. Glimpse into Modern Physics
   - Special Theory of relativity
   - Quantum mechanics

Student Learning Outcomes
Students will develop the critical thinking as well as the empirical, and quantitative skills necessary to solve physics problems, which by their nature involve taking a real-world situation and determining how physical laws may be applied. The laboratory will help students conceptualize unfamiliar theoretical ideas learned in class.

General Objectives:
Upon completion of this course, the student will be able to:
1. Understand the fundamental laws of nature and write them in the mathematical forms
2. Learn how to apply the laws of nature in order to solve the problems by help of the previously derived mathematical equations.
3. Develop problem-solving skills by collecting the given information and determining the correct equations (physical laws) to solve the given problem.
4. Test theories and laws by designing (or pre-designed) experiments during lab sessions.
5. Develop communication skills among colleagues while performing laboratory experiments.

Specific Objectives:
Upon completion of this course, the student will be able to
- Explain the concept of electric charges, electric field and apply Coulomb’s law.
- Apply Gauss’s law to find fields due to various charge distributions.
- Explain the concept of electric potential energy and understand how Capacitors can be used to store energy.
- Analyze DC circuits
- Explain magnetism and magnetic fields. The student will also be able to apply Biot-Savart’s law, Lenz’s law and Faraday’s law to various problems.
- Analyze AC circuits
- Understand the significance of Maxwell’s equation.
- Explain and utilize the principles of Optics.

Required Open Source Textbooks (Available online for free)
https://openstax.org/details/books/university-physics-volume-3

Homework Service Enrollment: The Expert TA, interactive online HW. Please click the following link: http://goeta.link/USQ45TX-0C55D2-2J4

Follow the directions and make an account with your @mavs.uta.edu email and Student ID number. Please enter your name as in university records. It helps with the transfer of grades from the expert ta to CANVAS easier.

In addition to HWs and Bonus HWs, the weekly quiz and the 3 exams will be hosted using the “The Expert TA” portal.

Physics Lab: The laboratory section of the class is virtual and will use the online platform https://phet.colorado.edu/. More information at: www.uta.edu/physics/labs and at the end of this syllabus.

Descriptions of major assignments and examinations
The weekly mandatory HWs pertaining to topic taught previously must be completed via “The Expert TA” within the due date. We will have two mid-term examination and one final examination which will be conducted online (using “The Expert TA”). We will have timed open book examinations. We will have mock exams in “The Expert TA” before actual midterm tests. Participation in actual tests (2 midterms and 1 final) and 2 mock tests will earn you points towards the grade as descried below. In addition, each HW will be followed by a bonus HW. It is optional and will earn you extra points. There will also be weekly online quiz of 15 minutes duration in “The Expert TA” every Monday (starting January 25, 2021). This also will give you another opportunity to increase your grade.

Technology Requirements
This course is entirely online and thus requires an adequate internet connection. The course will primarily use the Canvas platform. If there are issues with CANVAS, the synchronous class will be carried out using TEAMS. In such case the link will be shared ahead of time. If the student does not have home access to stable internet connection, they will have to arrange for the appropriate capabilities through the UTA library or comparable resource. Students can access tutorials on these tools by clicking on the “Get Started” Box on their Canvas Homepage. The tests do not employ lockdown browser and hence, camera is not a required hardware.

Other Requirements
The associated lab may require completion of weekly assignments and may involve a comprehensive evaluation. Laboratory participation is a necessity unless you have previously completed the lab with a C or better and petition for lab replacement. Additional information regarding laboratory will be provided by the laboratory coordinator.
Course Schedule: May change depending on the requirements of the class

Spring Regular Session (starts January 19\textsuperscript{th}, last day of spring session May 4\textsuperscript{th}).
First day of our class: January 20\textsuperscript{th} Wednesday; Last day of our class: 3\textsuperscript{rd}, Monday.
All lectures and related contents will be recorded and will be uploaded in CANVAS modules.
Mock Mid-Term 1: March 2\textsuperscript{nd}, Tuesday (Open all day). This is just to practice how the exam is done.
No review before Mid Term 1
Mid-Term 1: March 3\textsuperscript{rd}, Wednesday (1:00 PM – 1:50 PM). Portions covered till February 24\textsuperscript{th}
(January 20, 25, 27, February 1, 3, 8, 10, 15, 17, 22, 24).
Mock Mid-Term 2: April 13\textsuperscript{th}, Tuesday (Open all day). This is just to practice how the exam is done.
No review before Mid Term 2
Mid Term 2: April 14\textsuperscript{th}, Wednesday (1:00 PM – 1:50 PM). Portions covered till April 7\textsuperscript{th} (March 1, 10, 12, 22, 24, 29, 31, April 5, 7).
Review will be on April 28, and May 03.
Final Exams will be comprehensive and will be held on Friday, May 7 (11 –1:30 p.m.)

Optional Online Quiz: 15-minute test with one or two problem:
1. January 25, 2021. Time 1:00 - 1:15 PM (Portions covered on January 20)
2. February 1, 2021. Time 1:00 - 1:15 PM (Portions covered on January 25, 27)
3. February 8, 2021. Time 1:00 - 1:15 PM (Portions covered on February 1, 3)
4. February 15, 2021. Time 1:00 - 1:15 PM (Portions covered on February 8, 10)
5. February 22, 2021. Time 1:00 - 1:15 PM (Portions covered on February 15, 17)
6. March 1, 2021. Time 1:00 - 1:15 PM (Portions covered on February 22, 24)
7. March 8, 2021. Time 1:00 - 1:15 PM (Portions covered on March 1)
8. March 29, 2021. Time 1:00 - 1:15 PM (Portions covered on March 22, 24)
9. April 05, 2021. Time 1:00 - 1:15 PM (Portions covered on March 29, 31)
10. April 12, 2021. Time 1:00 - 1:15 PM (Portions covered on April 05, 07)
11. April 19, 2021. Time 1:00 - 1:15 PM (Portions covered on April 12)
12. April 26, 2021. Time 1:00 - 1:15 PM (Portions covered on April 19, 21, and 23)

Online HW
1. The due dates of all HWs will appear in The Expert TA. Please check that regularly.

Grading Information

Grading (in % of maximum final score)

- Homework (average of all HWs): 26%
- Timely participation in two mid-term examinations/final examination/mock tests: 2%
- Midterms I & II: 26% (Higher one) 16% (Lower one)
- Lab Grade: 10%
- Comprehensive Final: 20%
- Extra points (acquired through work which is optional)
  - Bonus Homework (average of all bonus HWs): 5%
  - Weekly Quiz (average of all quizzes): 15%

Scale: A: 90.00-100%, B: 80.00-89.99%, C: 70.00-79.99%, D: 60.00-69.99%.
The maximum final score that can be achieved is 100. The bonus HW and quizzes provides additional 20 points. Optional bonus HWs and weekly quizzes can be used effectively to improve the overall grade.

Any work not completed by its end date will be assigned a grade of zero, though in some rare cases homework assignments may have their end dates extended. Students are expected to keep track of their performance throughout the semester and seek guidance from available sources (instructor) if their performance drops below satisfactory levels (see “Student Support Services” below).

**Make-up Exams**
Make-up exams are not foreseen to be given.

**Expectations for Out-of-Class Study**
Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend a minimum of an additional 9 hours per week of their own time in course-related activities, including reading required materials, completing assignments, preparing for exams, etc.

**Physics Clinic**: I highly recommend that students make good use of the free virtual physics clinic. The clinic will open at designated times virtually

(https://teams.microsoft.com/l/channel/19%3ae5b118c00e8d4baa8c0b2b4be09bbcd5%40thread.tacv2/General?groupId=a272a438-e2fd-42e7-8c18-1a8166647940&tenantId=5cde5b43-d7be-4caa-8173-729e3b0a62d9)

where you join and work on your assignments with tutors available to guide you (but not just give you answers).

**Grade Grievances**
Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current University Catalog. [see Undergraduate Grading Policies; For student complaints, see Student Complaints.]

**Institution Information**
UTA students are encouraged to review the institutional policies and informational sections and reach out to the specific office with any questions. To view this institutional information, please visit the Institutional Information page (https://resources.uta.edu/provost/course-related-info/institutional-policies.php) which includes the following policies among others:

- **Drop Policy**: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance**. Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships.

- **Disability Accommodations**: UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including The Americans with Disabilities Act (ADA), The Americans with Disabilities Amendments Act (ADAAA), and Section 504 of the Rehabilitation Act. All instructors at UT Arlington are required by law to provide “reasonable accommodations” to students with disabilities, so as not to discriminate on the basis of disability.
Students are responsible for providing the instructor with official notification in the form of a letter certified by the Office for Students with Disabilities (OSD). Only those students who have officially documented a need for an accommodation will have their request honored. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting: The Office for Students with Disabilities, (OSD) or calling 817-272-3364. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at the OSD website.

- **Title IX Policy:** Title IX is a federal law that protects against sex and gender-based discrimination, sexual harassment, sexual assault, sexual misconduct, dating/domestic violence, sexual exploitation and stalking at federally funded educational institutions. UT Arlington is committed to fostering a learning and working environment free from discrimination in all its forms. When sexual misconduct occurs in our community, the university can:

  1. Intervene to prevent harmful behavior from continuing or escalating
  2. Provide support and remedies to students and employees who have experienced harm or have become involved in a Title IX Investigation
  3. Investigate and discipline violations of the university’s relevant policies.

Faculty members and certain staff members are considered “Responsible Employees” or “Mandatory Reporters,” which means that they are required to report violations of Title IX to the Title IX Coordinator. **I am a Responsible Employee and must report any Title IX related incidents that are disclosed in writing, discussion, or one-on-one.** Before talking with me, or with any faculty or staff member about a Title IX related incident, be sure to ask whether they are a responsible employee. If you want to speak with someone for support or remedies without making an official report to the university,

For more information about policies, reporting options and resources, visit the Title IX website: [www.uta.edu/titleix](http://www.uta.edu/titleix) or contact the Title IX Coordinator Michelle Willbanks at: [titleix@uta.edu](mailto:titleix@uta.edu).

- **Academic Integrity:** Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

  I pledge, on my honor, to uphold UT Arlington’s tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.
  I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code in their courses by having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System Regents’ Rule 50101, §2.2, suspected violations of university’s standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student’s suspension or expulsion from the University. Additional information is available at [Student Conduct](https://www.uta.edu/studentconduct). Faculty are encouraged to discuss plagiarism and share the following library tutorials [Copyright & Fair Use: Plagiarism](https://www.uta.edu/library/copyright/plagiarism) and [Acknowledging Sources](https://www.uta.edu/library/assignment/acknowledging_sources).
• **Student Feedback Survey:** At the end of each term, students enrolled in face-to-face and online classes categorized as “lecture,” “seminar,” or “laboratory” are directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student’s feedback via the SFS database is aggregated with that of other students enrolled in the course. Students’ anonymity will be protected to the extent that the law allows. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback is required by state law and aggregate results are posted online. Data from SFS is also used for faculty and program evaluations. For more information, visit [Student Feedback Survey](https://www.uta.edu/student-satisfaction/feedback/).

• **Final Exam Schedule:** Please check: [https://www.uta.edu/records/calendars/final-exams.php](https://www.uta.edu/records/calendars/final-exams.php) for final exam schedule.

• **Electronic Communication:** UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at [OIT: Student MavMail](https://www.uta.edu/records/calendars/final-exams.php).

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**Additional Information**

**Mandatory Face Covering Policy**
All students and instructional staff are required to wear facial coverings while they are on campus, inside buildings and classrooms. Students that fail to comply with the facial covering requirement will be asked to leave the class session. If students need masks, they may obtain them at the Central Library, the E.H. Hereford University Center’s front desk or in their department. Students who refuse to wear a facial covering in class will be asked to leave the session by the instructor, and, if the student refuses to leave, they may be reported to UTA’s Office of Student Conduct. Note: since this class is entirely online, you are not required to wear a face mask unless you are taking the class in a public area (library, for example).

**Attendance**
At the University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator of student success. Each faculty member is free to develop his or her own methods of evaluating students’ academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, I allow students to attend at their own discretion. **My view is that attendance is expected but will not directly count towards your grade. You are HIGHLY encouraged to attend class as students that do demonstrate a greater proficiency on tests.** On Mondays, during the first 15 minutes of the class we will have a quiz to be taken at the portal “The Expert TA.” It is optional but can give you an opportunity to improve your grade. **While UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients “begin attendance in a course.”** UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student, a grade of F, faculty report must the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Canvas. This date is reported to the Department of Education for federal financial aid recipients. If you intend to drop the class, please make sure to report to me. **Please note lab attendance is compulsory. There are lab reports due every week, usually at the end of the lab period.**
**Student Success Programs**

UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring by appointment, drop-in tutoring, etutoring, supplemental instruction, mentoring (time management, study skills, etc.), success coaching, TRIO Student Support Services, and student success workshops. For additional information, please email resources@uta.edu, or view the Maverick Resources website.

The IDEAS Center (https://www.uta.edu/ideas/) (2nd Floor of Central Library) offers FREE tutoring and mentoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. Students can drop in or check the schedule of available peer tutors at www.uta.edu/IDEAS, or call (817) 272-6593.

**Emergency Phone Numbers**

Enter the UTA Police Department’s emergency phone number into your own mobile phone. In case of an on-campus emergency, call the UT Arlington Police Department at 817-272-3003 (non-campus phone), 2-3003 (campus phone). You may also dial 911. Non-emergency number 817-272-3381

**Library Information**

**Research or General Library Help**

Ask for Help

- Academic Plaza Consultation Services (library.uta.edu/academic-plaza)
- Ask Us (ask.uta.edu/)
- Research Coaches (http://libguides.uta.edu/researchcoach)

Resources

- Library Tutorials (library.uta.edu/how-to)
- Subject and Course Research Guides (libguides.uta.edu)
- Librarians by Subject (library.uta.edu/subject-librarians)
- A to Z List of Library Databases (libguides.uta.edu/az.php)
- Course Reserves (https://uta.summon.serialssolutions.com/#!/course_reserves)
- Study Room Reservations (openroom.uta.edu/)
All Physics Labs Start on February 8 (Monday)

Physics Lab Web Site: [ww.uta.edu/physics/labs](http://ww.uta.edu/physics/labs)
All Virtual Labs will be conducted on the Online Platform at: [https://phet.colorado.edu/](https://phet.colorado.edu/)

Your TA will provide you a copy of the lab manual in Canvas. Other required materials for the lab include a computer, highspeed internet, MS-Office and Adobe PDF.

These are online synchronous labs and your TA will set up meeting in the Canvas Conference Room

**Teaching Assistant**

Name:  
Email:  
Office:  

Office Hours:

**Lab Supplements:** Available at the above website for some of the lab exercises.

**Mechanics Labs**

Unit 1: Kinematics 1-D  
Unit 2: Kinematics 2-D  
Unit 3: Force and Motion  
Unit 4: Circular Motion  
Unit 5: Collisions  
Unit 6: Work and Energy  
Unit 7: Simple Harmonic Motion  
Unit 8: Buoyancy & Archimedes Principle

**Electricity and Magnetism Labs**

Unit 1: Electric Charge & Field  
Unit 2: Capacitor  
Unit 3: Ohm’s Law & Kirchoff’s Law  
Unit 4: AC-Circuits  
Unit 5: Electromagnetic Induction  
Unit 6: Electromagnetic Waves  
Unit 7: Reflection-Refraction  
Unit 8: Waves Interference/Diffraction

**Lab Exemptions:**

- A student can file for a lab exemption if he/she has taken, completed, and passed the lab (with 70% or more) at UTA within the past three years, or has taken the lab as a separate graded course at another university (copy of transcript showing lab grade is required). The current course instructor or the lab Supervisor decides upon acceptance of the lab exemption.
- Lab exemptions must be on file by the census date. Failure to have a lab exemption on record for the current semester and not attending any labs can result in a grade of zero for the lab.
- Email your TA or your professor to receive the exempt form.

**Students with Disabilities:**

Students who need an accommodation based on disability should arrange to contact the TA to determine what arrangements are necessary to accommodate your needs. Prior to this meeting, the Office for Students with Disabilities should be contacted. The Office for Students with Disabilities is working remotely and has
adopted email as an official means of communication with students for all services. They can also be reached by phone at (817) 272 3364. Appointments are being conducted over the telephone or through Teams.

**Lab Attendance:**
- You are required to attend the scheduled lab in Canvas Conference Room.
- If a lab is missed see Missed Lab section below for your options.
- Absences due to chronic or emergency medical problems will be handled on an individual basis.
- If you are aware that you will be absent from a lab due to a University excused absence, you must notify your lab instructor a week ahead of time, and arrange to complete the lab in some other section during the week in which the lab is assigned. Notifying after the event voids the excused absence as outlined in the rules and regulations for excused absences in the Undergraduate Catalog.

**Missed Labs:**
Some circumstances may arise that prevent you from attending a scheduled lab period. However, with enrollment up, lab space is very limited, and finding a lab that has space and meets your schedule may not be possible. **Note:** A scheduled routine doctors or dentist appointment does not qualify under the lab attendance policy for emergency medical treatment and will be treated as a missed lab.

We will make reasonable efforts to accommodate students who miss labs due to illness or other category of excused absence, however, an excused absence does not exempt the student from completing the required work. Please note that if 2 or more labs are missed, it may be necessary for students to arrange for a grade of incomplete for that semester and to make up the missed labs in the next semester.

**Lab Report Requirements:**
- Read the instructions thoroughly provided in the lab manual.
- Run the online simulations, link provided in the manual.
- Stay online for 3 hours to finish the lab. Your TA should be online during this time to answer your questions.
- Complete the lab report, the word document, by answering all the questions.
- Submit the report (word file or pdf ) in the Canvas.
- Your TA will notify you if any extra time is given to complete the report.

**Grading Policy:**
Lab grading is based upon:-
- Analysis of every experiments and inserted screen shots of diagrams
- Shown Calculations
- Completed Graphs
- Answer provided to given Problems
- Data accuracy

There will be total of 8 labs (10 % each) and a final exam (20 %)

**More information on lab report requirement and grading policy will be provided by your TA as the semester progresses (mostly during the first week of lab).**