Advanced Physics II PHYS 2426.882 FE

Course Syllabus: Summer 2 2025

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Office Hours	Monday	Tuesday	Wednesday	Thursday	Friday
	Online	Online	Online	Online	Online

The information contained in this syllabus is subject to change without notice. Students are expected to be aware of any additional course policies presented by the instructor during the course.

Course Description: Four credit hours. This is a calculus-based physics course intended for students majoring in computer science, engineering, mathematics, physics, or related fields of study. Topics include charge, electric fields, magnetic fields, electric potential, current, capacitance, resistance, electromotive force, simple DC and AC circuits, induction, electromagnetic waves, propagation of light and geometric optics.

Prerequisite(s): PHYS 2425 (Completed) MATH 2414 (Completed)

Required Textbook(s):
This course will utilize Webassign online resources for homework and exams. Access to the assignments and the electronic copy of the textbook Serway and Vuille, *Physics for Scientists and Engineers*,10th Edition, Cengage Learning, Stamford, CT, 2018 is provided by access to Webassign on the internet.

Publisher: Cengage Learning

ISBN Number: 978-1-337-55327-8

Calculator: You will need a scientific calculator or graphing calculator for this class.

Required Computer Literacy Skills: You will need to be able to navigate Blackboard and Webassign to access your online course work.

Student Learning Outcomes:

Upon successful completion of this course, students will:

2426.1 Articulate the fundamental concepts of electricity and electromagnetism, including electrostatic potential energy, electrostatic potential, potential difference, magnetic field, induction, and Maxwell's Laws.

2426.2 State the general nature of electrical forces and electrical charges, and their relationship to electrical current.

2426.3 Solve problems involving the inter-relationship of electrical charges, electrical forces, and electrical fields.

2426.4 Apply Kirchoff's Laws to analysis of circuits with potential sources, capacitance, and resistance, including parallel

and series capacitance and resistance.

2426.5 Calculate the force on a charged particle between the plates of a parallel-plate capacitor.

2426.6 Apply Ohm's Law to the solution of problems.

2426.7 Describe the effects of static charge on nearby materials in terms of Coulomb's Law.

2426.8 Use Faraday's and Lenz's Laws to find the electromotive force.

2426.9 Describe the components of a wave and relate those components to mechanical vibrations, sound, and decibel level.

2426.10 Articulate the principles of reflection, refraction, diffraction, interference, and superposition of waves.

2426.11 Solve real-world problems involving optics, lenses, and mirrors.

2426L.1 Prepare laboratory reports that clearly communicate experimental information in a logical and scientific manner and evaluate the accuracy of physical measurements and potential sources of error in measurements.

2426L.2 Conduct basic laboratory experiments involving electricity and magnetism.

2426L.3 Relate physical observations and measurements involving electricity and magnetism to theoretical principles.

Core Curriculum Purpose and Objectives:

Through the core curriculum, students will gain a foundation of knowledge of human cultures and the physical and natural world; develop principles of personal and social responsibility for living in a diverse world; and advance intellectual and practical skills that are essential for all learning.

Courses in the foundation area of mathematics focus on quantitative literacy in logic, patterns, and relationships. In addition, these courses involve the understanding of key mathematical concepts and the application of appropriate quantitative tools to everyday experience.

College Student Learning Outcomes:

Critical Thinking Skills

CT.1 Students will demonstrate the ability to 1) analyze complex issues, 2) synthesize information, and 3) evaluate the logic, validity, and relevance of data.

Communication Skills

CS.1 Students will effectively develop, interpret and express ideas through written communication.

Empirical and Quantitative Skills

EQS.1 Students will manipulate numerical data or observable facts by organizing and converting relevant information into mathematical or empirical form

EQS.2 Students will analyze numerical data or observable facts by processing information with correct calculations, explicit notations, and appropriate technology.

EQS.3 Students will draw informed conclusions from numerical data or observable facts that are accurate, complete, and relevant to the investigation.

Teamwork

TW.2 Students will work with others to support and accomplish a shared goal.

SCANS Skills:
N/A

Course Outline:

Chapter 22: Electric Fields
Chapter 23: Continuous Charge Distributions and Gauss's Law
Chapter 24: Electric Potential
Chapter 25: Capacitance and Dielectrics
Chapter 26: Current and Resistance
Chapter 27: Direct-Current Circuits
Exam 1

Chapter 28: Magnetic Fields
Chapter 29: Sources of Magnetic Field
Chapter 30: Faraday's Law
Exam 2

Chapter 33: The Nature and Propagation of Light
Chapter 34: Geometric Optics
Chapter 35: Interference
Chapter 36: Diffraction
Exam 3

Evaluation/Grading Policy:
Homework assignments and quizzes (administered via Webassign) will each represent 15% of your grade. Laboratory work utilizing the purchased lab kit will represent 10% of your grade. There will be 3 unit exams with the 3rd exam administered during the final exam window. The average of the exams will represent 60% of your final grade. The exams will utilize the built in Webassign lockdown browser during administration. The lockdown browser is used for the introductory assignment to allow you the opportunity to download the lockdown browser prior to the first exam that requires it.

Homework / Quizzes	30%
Lab Grade	10%
Exams (3)	60%
	100%

The letter grading system is: A (90-100%), B (80-89%), C (70-79%), D (60-69%), F (0-59%).

Online homework assignments are graded exercises posted on Webassign. Homework problems can be reworked up to five times with reducing credit. The last grade earned for each homework assignment will be posted for the final grade. There are no make-up assignments.

Quizzes are short knowledge check problems combining multiple topics. These are administered through Webassign. See the Webassign assignment schedule for quiz due dates..

Online exams are each available on Webassign at scheduled times. Two attempts are allowed with decreasing credit for each individual exam question, but only one submission is allowed for each online exam. Exams have a three hour time limit and must be completed during the testing window during one session. Course averages will be updated in Blackboard after each exam.

NTCC Academic Honesty Statement:
"Students are expected to complete course work in an honest manner, using their intellects and resources designated as allowable by the course instructor. Students are responsible for addressing questions about allowable resources with the

course instructor. NTCC upholds the highest standards of academic integrity. This course will follow the NTCC Academic Honesty policy stated in the Student Handbook."

Academic Ethics
The college expects all students to engage in academic pursuits in a manner that is beyond reproach. Students are expected to maintain complete honesty and integrity in their academic pursuit. Academic dishonesty such as cheating, plagiarism, and collusion is unacceptable and may result in disciplinary action. Refer to the student handbook for more information on this subject.

ADA Statement:
It is the policy of NTCC to provide reasonable accommodations for qualified individuals who are students with disabilities. This College will adhere to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student's responsibility to arrange an appointment with a College counselor to obtain a Request for Accommodations form. For more information, please refer to the NTCC Catalog or Student Handbook.

Family Educational Rights And Privacy Act (Ferpa):
The Family Educational Rights and Privacy Act (FERPA) is a federal law that protects the privacy of student education records. The law applies to all schools that receive funds under an applicable program of the U.S. Department of Education. FERPA gives parents certain rights with respect to their children's educational records. These rights transfer to the student when he or she attends a school beyond the high school level. Students to whom the rights have transferred are considered "eligible students." In essence, a parent has no legal right to obtain information concerning the child's college records without the written consent of the student. In compliance with FERPA, information classified as "directory information" may be released to the general public without the written consent of the student unless the student makes a request in writing. Directory information is defined as: the student's name, permanent address and/or local address, telephone listing, dates of attendance, most recent previous education institution attended, other information including major, field of study, degrees, awards received, and participation in officially recognized activities/sports.

6 Drop Rule:
Students who enrolled in Texas public institutions of higher education as first-time college students during the Fall 2007 term or later are subject to section 51.907 of the Texas Education Code, which states that an institution of higher education may not permit a student to drop (withdraw with a grade of "W") from more than six courses. This six-course limit includes courses that a transfer student has previously dropped at other Texas public institutions of higher education if they fall under the law. Students should be sure they fully understand this drop limit before they drop a course. Please visit the admissions office or counseling/advising center for additional information and assistance.

Other Course Policies:
The college's official means of communication is via your campus email address. I will use your campus email address and Blackboard to communicate with you outside of class. Make sure you keep your campus email cleaned out and below the limit so you can receive important messages.

Tentative Course Timeline (*note* instructor reserves the right to make adjustments to this timeline at any point in the term):

Chap.	Title	*Week*	*Key Due Dates**
22	Electric Fields	*1 - 3*	
23	Continuous Charge Distributions and Gauss's Law	*1 - 3*	
24	Electric Potential	*1 -3*	
25	Capacitance and Dielectrics	*1 - 3*	
26	Current and Resistance	*1 – 3*	
27	Direct-Current Circuits	*1 - 3*	
	Exam #1		***7/28/25***
28	Magnetic Fields	*3 – 4*	
29	Sources of Magnetic Field	*3 – 4*	
30	Faraday's Law	*3 - 4*	
	Exam #2		***8/5/25***
33	The Nature and Propagation of Light	*4 – 5*	
34	Geometric Optics	*4 - 5*	
35	Interference	*4 – 5*	
36	Diffraction	*4 - 5*	
	Exam #3		***8/14/25***

**This calendar will be adjusted to the needs of the course. Changes will be based on the course progress. The exam dates could be moved one or two days up or down. The Final Exam date is fixed and will not change.*