

# PHYS 2426 — University Physics II

## Frank Phillips College

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### General Course Information

Credit Hours: 4

General Education Core Curriculum Course

### Prerequisite

Completion of PHYS 2425 with a grade of C or better.

### Course Description

Principles of physics for science, computer science, mathematics, and engineering majors, using calculus, involving the principles of electricity and magnetism, including circuits, electromagnetism, waves, sound, light, and optics. Must be taken with a laboratory section which includes laboratory experiments supporting theoretical principles presented in PHYS 2326 involving the principles of electricity and magnetism, including circuits, electromagnetism, waves, sound, light, and optics; experimental design, data collection and analysis, and preparation of laboratory reports.

THECB Approval Number .....40.0101.57.03

### Statement of Purpose

Through the Texas 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.

### Core Objectives Required for Life and Physical Sciences Courses

Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method.

Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.

- **Critical Thinking Skills** – to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
- **Communication Skills** – to include effective development, interpretation and expression of ideas through written, oral and visual communication
- **Empirical and Quantitative Skills** – to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions
- **Teamwork** – to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

<b>Required Core Objective</b>	<b>Activity Related to Core Objective</b>
Communication – to include effective development, interpretation, and expression of ideas through written, oral, and visual communication	Students will read a curriculum related article supplied by the instructor and write an article review, including a summary and a critique.
Communication – to include effective development, interpretation, and expression of ideas through written, oral, and visual communication	Students will demonstrate understanding of their article by writing a short summary as a question on a test.
Communication – to include effective development, interpretation, and expression of ideas through written, oral, and visual communication	Using a method that will keep the student’s identity secure, such as Socratic, they will be asked to evaluate the assignment with a few brief questions.
Critical Thinking Skills – to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information	Students will read a curriculum related article supplied by the instructor and write an article review, including a summary and a critique. Students will demonstrate critical thinking by showing they understand the main points of the article, and by critiquing the article.
Critical Thinking Skills – to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information	Students will demonstrate critical thinking by identifying the places they demonstrated critical thinking in their article. They will do so by answering a question on a test.
Critical Thinking Skills – to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information	Using a method that will keep the student’s identity secure, such as Socratic, they will be asked to evaluate the assignment with a few brief questions.
Empirical and Quantitative Skills – To include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions	Lab Demonstration: Each student will participate in a lab demonstration that includes the purpose of the lab, apparatus, data, calculations and conclusion.
Empirical and Quantitative Skills – To include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions	Lab Demonstration: Students will demonstrate understanding of their lab demonstration by answering a question on a test.
Empirical and Quantitative Skills – To include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions	Lab Demonstration: Using a method that will keep the student’s identity secure, such as Socratic, they will be asked to evaluate the assignment with a few brief questions.
Teamwork – To include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal	Students will participate in a lab demonstration that includes the purpose of the lab, apparatus, data, calculations and conclusion.
Teamwork – To include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal	Students will demonstrate understanding of their lab demonstration by answering a question on a test.
Teamwork – To include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal	Using a method that will keep the student’s identity secure, such as Socratic, they will be asked to evaluate the assignment with a few brief questions.

**Learning Outcomes:**

Upon successful completion of this course, students will:

1. Articulate the fundamental concepts of electricity and electromagnetism, including electrostatic potential energy, electrostatic potential, potential difference, magnetic field, induction, and Maxwell's Laws.
2. State the general nature of electrical forces and electrical charges, and their relationship to electrical current.
3. Solve problems involving the inter-relationship of electrical charges, electrical forces, and electrical fields.
4. Apply Kirchhoff's Laws to analysis of circuits with potential sources, capacitance, and resistance, including parallel and series capacitance and resistance.
5. Calculate the force on a charged particle between the plates of a parallel-plate capacitor.
6. Apply Ohm's law to the solution of problems.
7. Describe the effects of static charge on nearby materials in terms of Coulomb's Law.
8. Use Faraday's and Lenz's laws to find the electromotive forces.
9. Describe the components of a wave and relate those components to mechanical vibrations, sound, and decibel level.
10. Articulate the principles of reflection, refraction, diffraction, interference and superposition of waves.
11. Solve real-world problems involving optics, lenses, and mirrors.

**And;**

1. Prepare laboratory reports that clearly communicate experimental information in a logical and scientific manner.
2. Conduct basic laboratory experiments involving electricity and magnetism.
3. Relate physical observations and measurements involving electricity and magnetism to theoretical principles.
4. Evaluate the accuracy of physical measurements and the potential sources of error in the measurements.
5. Design fundamental experiments involving principles of electricity and magnetism.
6. Identify appropriate sources of information for conducting laboratory experiments involving electricity and magnetism.

## Methods of Evaluation

Students' successful completion of required assignments as well as participation in classroom learning activities will be the basis for assessing progress toward course objectives.

Category	Percentage
Homework assignments	10%
Laboratory Grade	30%
Exams	50%
Semester Exam	10%
Total	100%

The majority of your evaluation comes through traditional methods; however, participation in laboratory exercises and class discussion will also contribute to your grade.

## Academic Honesty and Integrity

Students attending Frank Phillips College are expected to maintain high standards of personal and scholarly conduct. Academic dishonesty including, but not limited to, cheating, collusion (working with anyone else to produce work for which you take credit without the professor's permission), utilizing resources such as books and notes for a test without the professor's permission, and plagiarism is considered a serious offense and may result in disciplinary actions including:

- A grade of 0 for the test or assignment
- A semester grade of F for the course
- Administrative withdrawal from the course
- Academic suspension
- Notation of the student's transcript of "Academic Dishonesty."
- \*\*\*Faculty members have the right to assign a failing grade to a student who is guilty of academic dishonesty at any point during a semester. Faculty members may prohibit a student from dropping a course when academic dishonesty is discovered. However, if a student has dropped the course in accordance with the rules and dates applied to dropping a course and prior to the discovery of academic dishonesty, the grade of W will stand. Students currently enrolled in a course and students who have completed a course (A, B, C, D, CT, and I) may have a grade changed to an F if academic dishonesty is discovered. The faculty member must notify the student of the change to the final grade within one week of facilitating the change. The student will have the opportunity to appeal the final grade change according to the college policy stated in the catalog.

## Class Attendance

Regular attendance is necessary for satisfactory achievement. Therefore, it is the responsibility of the student to attend class in accordance with requirements of the course as established by the instructor.

Students will be excused from class without penalty when either representing the college in an approved activity or having an approved reason for not attending. Reasons for absences must be approved by the instructor of the course. These exceptions do not relieve the student of the responsibility of making up the missed work as designated by the

instructor concerned.

**Students who enroll in one or more college-preparatory course(s) because of TSI deficiency will be administratively withdrawn from all classes if the course in which they are excessively absent is their only preparatory course.** For a student enrolled in more than one preparatory course, the student may be dropped from only the course affected by absences.

Any student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day, provided that proper notification of the absence is given to the instructor of the course missed. The student should notify the instructor within the first fifteen (15) days of the semester that he or she intends to be absent on the specified holy day.

### **Cell Phones and Other Electronic Devices Procedure:**

Cell phones and electronic devices in the classroom create a distraction for both students and faculty. Cell phones are also considered suspicious during test taking. Therefore, Frank Phillips College outlines the procedure for handling cell phone usage in a classroom as follows:

1. **First Offense:** the student will be warned verbally by the instructor to turn off the cell phone or electronic device or by appropriate administrative personnel at distance sites. The instructor will make a notation of the infraction.
2. **Second Offense:** the student will be asked to leave the class period for the day and will receive zeroes for any work done in class on that day; a student receiving instruction through remote connection at an off-campus site will be required to attend the class face to face in Borger from this class date forward.
3. **Third Offense:** the student will be administratively withdrawn from the class in which the infraction occurred and will receive no refund for the class.

Students should leave the college's main number with an appropriate contact in case of an emergency.

Borger: (806) 457-4200, ext. 0 or 886-5047 after hours

Dalhart: (806) 244-7669

Perryton: (806) 648-1450

### **Grievance Policy**

If you have a dispute concerning your grade or policies in this class, it is your responsibility to FIRST contact the instructor, either by e-mail or in person, to discuss the matter. Should things remain unresolved after this initial contact, please follow the procedures described in the Academic Policies section of the Frank Phillips College Catalog. In the vast majority of cases, the matter can be resolved at the instructor/student level, and learning to communicate your concerns in a civilized manner is part of the college experience.

## **Important Information**

Frank Phillips College is a Microsoft Office Campus. You must submit your electronic assignments in Microsoft Office programs only. If you do not have Microsoft Office, you may use one of the computer lab sites on campus for your class work.

## **Scans/Or Core Competencies That Will Be Addressed in the Class**

### **Resources:**

Allocates Time  
Allocates Money  
Allocates Material & Facility Resources

### **Interpersonal:**

Participates as a Member of a Team  
Teaches Others  
Serves Clients/Customers  
Exercises Leadership  
Negotiates to Arrive at a Decision  
Works with Cultural Diversity

### **Technology:**

Selects Technology  
Applies Technology  
Maintains & Troubleshoots Technology

### **Basic Skills:**

Reading  
Writing  
Arithmetic  
Mathematics  
Listening & Speaking

### **Information:**

Acquires & Evaluates Information  
Organizes & Maintains Information  
Uses Computers to Process Information

### **Thinking Skills:**

Creative Thinking  
Decision Making  
Problem Solving  
Seeing Things in the Mind's Eye  
Knowing How to Learn  
Reasoning

### **Systems:**

Understands Systems  
Monitors & Corrects Performance  
Improves & Designs Systems

### **Personal Qualities:**

Responsibility  
Self-Esteem  
Sociability  
Self-Management  
Integrity/Honesty