Angelina College
Science and Mathematics Division
PHYS 2426 University Physics II
Instructional Syllabus

I. BASIC COURSE INFORMATION

A. Course Description

Physics 2426. University Physics II. Four semester hours credit. Four semester hours credit. Electricity, magnetism, optics, light, electromagnetic radiation. Three lecture hours and three lab hours each week. Prerequisite: Physics 2425. Lab fee.

B. Intended Audience This course is appropriate for science majors who need a calculus-based two-semester survey of college physics with laboratory. A strong background in algebra, trigonometry, and calculus is necessary.

C. Instructor -

Name: Dr. John Harper
Office Location: S202A
Office Hours: MW 10:00-11:00, TR 8:30-9:30 am, 1:00-2:00 pm (others by appointment)
Phone: (936) 633-5261
E-mail Address: jharper@angelina.edu

II. INTENDED STUDENT OUTCOMES:

II. Core Objectives Required for this Course

1. **Critical Thinking:** to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
2. **Communication:** to include effective development, interpretation and expression of ideas through written, oral and visual communication
3. **Empirical and Quantitative Skills:** to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions
4. **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. Course Learning Outcomes for All Sections

Upon successful completion of this course, students will:

1. Understand the general nature of electrical forces and electrical charges, and their relationship to electrical current.
2. Solve problems involving the inter-relationship of electrical charges, electrical forces, and electrical fields.
3. Apply Kirchhoff's Laws to analyze circuits with potential sources and resistance, including parallel and series resistance.
4. Calculate the force on a charged particle between the plates of a parallel-plate capacitor.
5. Apply Ohm’s law to the solution of circuit problems.
6. Use Faraday's and Lenz's laws to find electromotive forces.
7. Apply the principles of diffraction and interference to optical problems.
8. Solve real-world problems involving lenses, and mirrors.

III. ASSESSMENT MEASURES

A. Assessments for the Core Objectives:

1. **Critical Thinking**:
   Students will complete an assignment on calculating electric field strength that requires the application of critical thinking skills. Results are assessed via a modified AC Critical Thinking rubric.
2. **Communication**:
   Students will effectively communicate their results and analysis of a lab project. Results are assessed via the AC Communications rubric.

3. **Empirical and Quantitative Skills:**
   Students will complete an assignment on calculating electric field strength that demonstrates empirical and quantitative skills. Results are assessed via an Empirical and Quantitative Skills rubric.
4. **Teamwork:**
   Students will produce a joint lab report that demonstrates their cooperative efforts. Results are assessed via a modified Teamwork rubric.

B. Assessments for Course Learning Outcomes Students will ...

1. demonstrate via homework assignments the ability to determine the net electrical force on a charge due to a specified charge distribution.
2. successfully evaluate electric fields due to given charge distributions.
3. apply Kirchhoff's Laws to solve electric circuits including series and parallel resistance.
4. calculate on the force involving a charged particle in the potential field of a parallel- plate capacitor.
5. solve problems involving electric circuits by applying Ohm's Law.
6. analyze electromotive forces and induced currents by applying Faraday's and Lenz's Laws.
7. apply the principles of interference to thin film reflections, and diffraction to spectra.
8. demonstrate the ability to determine the shape lenses to produce a given focal length.

IV. INSTRUCTIONAL PROCEDURES:

A. Methodologies common to all sections
This course is taught principally by lecture, supplemented as appropriate with demonstrations, class discussions, and critique of daily written work.

B. Methodologies determined by the instructor
Course information, including assignments, copies of handouts, review material, and printable views of the overheads used in class are available to all enrolled students via Blackboard on the internet.

V. COURSE REQUIREMENTS AND POLICIES:

A. Required Textbooks, Materials, and Equipment –

1. Physics for Scientists and Engineers by D. Giancoli (Prentice Hall), Fourth Edition.
2. A graphing scientific calculator is necessary to complete assignments.
   There is no laboratory manual that must be purchased. Individual lab information is distributed weekly at the beginning of labs and is available through Blackboard.

B. Specific Assignments Required for All Students–
Students are expected to complete in a timely manner specific assignments from the text chosen by the instructor, which will be critiqued and counted as part of the course grade. Specific problems are announced in class and are also available on the Blackboard site.

C. Course Policies – (This course conforms to the policies of Angelina College as stated in the Angelina College Handbook.)

Academic Assistance – Educational Accommodations – If you have a disability (as cited in Section 504 of the Rehabilitation Act of 1973 or Title II of the Americans with Disabilities Act of 1990) that may affect your participation in this class, you may fill out the Educational Accommodations application within your AC Portal, under the "Student Services" tab. A Student Success team member will contact you once the application is received. At a post-secondary institution, you must self-identify as a person with a disability in order to receive services; for questions regarding the application process you can visit the Office of Student Success and Inclusion in the Student Center (Room 200) or email access@angelina.edu. To report any complaints related to accommodations, you should contact Annie Allen, Director of Student Success & Inclusion, in Room 200 of the Student Center. You may also contact Ms. Allen by calling (936) 633-4509 or by emailing aallen@anglina.edu. To report discrimination of any type, contact Steve Hudman, Dean of Student Affairs, at (936) 633-5292 or shudman@angelina.edu.

Attendance –
Attendance is required as per Angelina College Policy and is recorded every day. Any student with three (3) consecutive absences or four (4) cumulative absences may be dropped from the class. Records will be turned in to the academic dean at the end of the semester. Do not assume that non-attendance in class will

always result in an instructor drop. **You must officially drop a class or risk receiving an F**.
Students are expected to attend and participate in weekly laboratory sessions.

Additional Policies Established by the Individual Instructor –
No eating, drinking, or smoking is allowed in any classroom, including the lab room.
Any child care problems must be handled outside the classroom.
Turn off cell phones and put away similar devices during class. Only calculators should be out.
Students are expected to exhibit civility and academic honesty (do your own work) during the course.
If you need to leave class early, inform the instructor - otherwise it will be counted as an absence.

VI. COURSE CONTENT:

V. Required Content/Topics Common to All Sections

The main topics planned for this course are:

Static (Chapt. 21-24) and current (Chapt 25-26) electricity
Magnetism (Chapt 27)
Electromagnetism and AC circuits (Chapt 20-30)
Electromagnetic waves (Chapt 31)
Light and optics (Chapt 32-35)
Relativity (Chapt 36)

VII. EVALUATION AND GRADING:

A. Grading Criteria

Grades are determined by numerical scores on the following written components:

Assignments (20%) Homework assignments are primarily problem solutions from the text. Each assignment is announced at the end of class, based on material covered. It should be turned in within one week. Thereafter, points are deducted for each class period it is late. Grading will reflect your technique as well as answers, so all relevant work should be shown.

Laboratory (20%) Each lab has a written report to be turned in within one week, and is worth a maximum of 25 points. Two points are deducted for each week it is late. Your two lowest (or missing) grades will be eliminated from consideration. One *missed lab* may be made up by appointment or at the end of the semester.

Tests (14% each) The chapters covered are given on the schedule. The lowest grade (which may be a missed test) is replaced by your next-lower test grade.

Final Exam (18%) This is a comprehensive test, but emphasizes the most recent material.

B. Determination of Grade

Letter grades are determined from your course average based on the following guidelines (which may be revised when appropriate in the student's favor) :

Numeric Average	Grade
90 - 100	A
80 - 89	B
70 - 79	C
60 - 69	D
Below 60	F

Your current average will be given after each test, and pass/fail status at mid-semester.

VIII. SYLLABUS MODIFICATION:

The instructor may modify the provisions of the syllabus to meet individual class needs by informing the class in advance as to the changes being made.

Class Schedule
Spring, 2019

Day	Date	Topic and Reading Assignment	
1	Jan 15	Electric charges and fields (21-1..6)	
2	17	Electric field calculations, dynamics (21-7,8,10)	
3	22	Flux, Gauss' Law (22-1..3)	
4	24	Electric potential (23-1..3)	
5	29	Potential calculations (23-4,5,7)	
6	31	Current, resistance, power (25-1..5)	
7	Feb 5	DC circuits (26-1..5)	
8	7	Capacitance (24-1,2,4..6)	
9	12	Magnetic fields (27-1,2,4,9)	
10	14	**Test 1 (Chapters 21 - 26)**	
11	19	Forces and torques on currents (27-3,5,6)	
12	21	Ampere's law (28-1..8)	
13	26	Faraday's law, Lenz's law (29-1..4)	
14	28	Transformers, Inductance (29-6,7; 30-1,2)	
15	Mar 5	Circuits with Inductance (30-2,5,7)	
16	7	AC circuits (30-7..9)	
	Spring Break	Mar 11-15	
17	19	**Test 2 (Chapters 27 - 30)**	
18	21	Maxwell's equations, radiation (31-1..5)	
19	26	Electromagnetic spectrum, light (31-6,7; 32-1,2)	
20	28	Reflection and refraction (32-3..7)	
21	Apr 2	Lenses (32-8, 33-1..4)	Last day to Drop Apr 1
22	4	Interference (34-1..5)	
23	9	Diffraction, resolution (35-1,3,4,7,8)	
24	11	**Test 3 (Chapters 30 - 34)**	
25	16	Polarization, relativity (35-11; 36-3)	
26	18	Special relativity (36-4..7)	
27	23	Lorentz transformations, Relativistic mechanics (36-8..11)	
28	25	Blackbody radiation, photoelectric effect (37-1..4)	
29	30	Wave-particle duality, Spectra,	
30	May 1	Bohr atom, Review (37-5..12)	
	May 7	**Comprehensive Final Exam** 11:00 a.m. - ????	