



**Purpose:** It is the intention of this Administrative-Master Syllabus to provide a general description of the course, outline the required elements of the course and to lay the foundation for course assessment for the improvement of student learning, as specified by the faculty of Wharton County Junior College, regardless of who teaches the course, the timeframe by which it is instructed, or the instructional method by which the course is delivered. It is not intended to restrict the manner by which an individual faculty member teaches the course but to be an administrative tool to aid in the improvement of instruction.

**Course Title** – University Physics II  
**Course Prefix and Number** – PHYS 2426  
**Department** - Physics  
**Course Type:** (check one)

**Division** – Math and Science

- Academic General Education Course (from ACGM – but not in WCJC Core)
- Academic WCJC Core Course
- WECM course (This course is a Special Topics or Unique Needs Course: Y or N)

**Semester Credit Hours # : Lecture Hours # : Lab/Other Hours #** 4:3:3

**Equated Pay hours for course** – 4.8

**Course Catalog Description** – Principles of physics for science, computer science, and engineering majors, using calculus, involving the principles of electricity and magnetism, including circuits, electromagnetism, waves, sound, light, and optics. Laboratory experiments support theoretical principles presented in lecture, experimental design, data collection and analysis, and preparation of laboratory reports.

List Lab/ Other Hours
Lab Hours 3
Clinical Hours
Practicum Hours
Other (list)

**Prerequisites/Co-requisites** – MATH 2414 AND PHYS 2425 or consent of the department head

**Prepared by**

**Date**

**Reviewed by Department Head** Kelley Whitley

**Date** 11-18-13

**Accuracy verified by Division Chair** Kevin Dees

**Date** 11-18-13

**Approved by Dean or Vice President of Instruction** gg hunt

**Date** 11-18-13

**I. Topical Outline** – Each offering of this course must include the following topics (be sure to include information regarding lab, practicum, clinical or other non-lecture instruction):

Lecture:

**TOPICAL OUTLINE DEDICATED INSTRUCTIONAL TIME**

Electric Charge and Coulomb's Law One Week  
 Electric Field and Gauss' Law One week  
 Electrostatic Potential, Capacitors Two weeks  
 DC Circuits Two weeks  
 Magnetic Field Two weeks  
 Electromagnetic Induction, Motors,  
 Magnetic Properties of Matter Two weeks  
 Alternating Current Two weeks  
 Electromagnetic Waves,  
 Maxwell's Equations One week  
 Reflection, Refraction and  
 Geometrical Optics One week  
 Interference, Diffraction, Wave Optics One week

Lab Work:

**EXPERIMENTS:**

Electrostatic field and Equipotential Surfaces  
 Volt and Ammeters, The Oscilloscope.  
 DC Series and Parallel circuits.  
 Construction of a simple power supply.  
 RC circuits.  
 RLC circuits.  
 Induced Emf.  
 Lenses and mirrors.  
 The compound Microscope.

**II. Course Learning Outcomes**

<b>Learning Outcomes</b>	<b>Methods of Assessment</b>
<p><b>Upon successful completion of this course, students will:</b></p> <ul style="list-style-type: none"> <li>-- Articulate the fundamental concepts of electricity and electromagnetism, including electrostatic potential energy, electrostatic potential, potential difference, magnetic field, induction, and Maxwell's Laws.</li> <li>-- State the general nature of electrical forces and electrical charges, and their relationship to electrical current.</li> <li>-- Solve problems involving the inter-relationship of electrical charges, electrical forces, and electrical fields.</li> </ul>	<p><b>Outcomes assessed by:</b></p> <p>Class work,            homework assignment,            quizzes and/or exams            teamwork rubric,            poster/graph/chart            oral</p>

<ul style="list-style-type: none"> <li>-- Apply Kirchhoff's Laws to analysis of circuits with potential sources, capacitance, and resistance, including parallel and series capacitance and resistance.</li> <li>-- Calculate the force on a charged particle between the plates of a parallel-plate capacitor.</li> <li>-- Apply Ohm's law to the solution of problems.</li> <li>-- Describe the effects of static charge on nearby materials in terms of Coulomb's Law.</li> <li>-- Use Faraday's and Lenz's laws to find the electromotive forces.</li> <li>-- Describe the components of a wave and relate those components to mechanical vibrations, sound, and decibel level.</li> <li>-- Articulate the principles of reflection, refraction, diffraction, interference and superposition of waves.</li> <li>-- Solve real-world problems involving optics, lenses, and mirrors.</li> <li>-- Prepare laboratory reports that clearly communicate experimental information in a logical and scientific manner.</li> <li>-- Conduct basic laboratory experiments involving electricity and magnetism.</li> <li>-- Relate physical observations and measurements involving electricity and magnetism to theoretical principles.</li> <li>-- Evaluate the accuracy of physical measurements and the potential sources of error in the measurements.</li> <li>-- Design fundamental experiments involving principles of electricity and magnetism.</li> <li>-- Identify appropriate sources of information for conducting laboratory experiments involving electricity and magnetism.</li> </ul>	<p><b>Labs assessed by:</b></p> <p>lab notebook entry,  formal lab report,  lab quiz,  homework assignment,  and/or exam question</p>
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**III. Required Text(s), Optional Text(s) and/or Materials to be Supplied by Student.**

University Physics, Revised edition, Benson, Harris, New York: John Wiley and Sons, Inc., 1996

**IV. Suggested Course Maximum – Lecture: 40; Lab: 20**

**V. List any specific spatial or physical requirements beyond a typical classroom required to teach the course.**

Physics Laboratory required for lab component.

**VI. Course Requirements/Grading System – Describe any course specific requirements such as research papers or reading assignments and the generalized grading format for the course**

Evaluative Procedures:

1. Four major tests
2. Homework assignments
3. Laboratory reports
4. Final Exam

The following method is used to arrive at the final grade:

All tests.	60%
Laboratory grade	10%
Homework	5%
Final examination	25%

The grade classifications as outlined in the College Catalog are employed:

A	90-100
B	80-89
C	70-79
D	60-69
F	59 or below
W	Withdrawn

## VII. Curriculum Checklist

- **Academic General Education Course** (from ACGM – but not in WCJC Core)  
No additional documentation needed

- **Academic WCJC Core Course**  
Attach the Core Curriculum Review Forms

- Critical Thinking
- Communication
- Empirical & Quantitative Skills
- Teamwork
- Social Responsibility
- Personal Responsibility

- **WECM Courses**  
If needed, revise the Program SCANS Matrix & Competencies Checklist.



**Core Curriculum Review Form**

Foundational Component Area: **Life & Physical Sciences**

Course Prefix & Suffix: \_\_\_\_\_

Core Objective: **Critical Thinking Skills**—to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information

*Student Learning Outcome supporting core objective:*

*For each core objective, there must be at least two different methods of assessment.*

SLO Status	Student Learning Outcome (SLO)	Learning Activity	Assessment
The SLO is:	Insert SLO (from Administrative Master Syllabi) below	Provide a brief name and description of the sample learning activity:	Provide a brief name and description of the sample quiz, exam, rubric, assignment, etc. for assessing the objective:
<input type="checkbox"/> Existing <input type="checkbox"/> Revised <input type="checkbox"/> New <input type="checkbox"/> State Mandated			
<input type="checkbox"/> Existing <input type="checkbox"/> Revised <input type="checkbox"/> New <input type="checkbox"/> State Mandated			
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Department Head: \_\_\_\_\_

Date: \_\_\_\_\_



**Core Curriculum Review Form**

Foundational Component Area: **Life & Physical Sciences**

Course Prefix & Suffix: \_\_\_\_\_

Core Objective: **Communication Skills**—to include effective development, interpretation and expression of ideas through written, oral and visual communication

*Student Learning Outcome supporting core objective:*

*For each core objective, there must be at least two different methods of assessment.*

SLO Status	Student Learning Outcome (SLO)	Learning Activity	Assessment
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Department Head: \_\_\_\_\_

Date: \_\_\_\_\_



**Core Curriculum Review Form**

Foundational Component Area: **Life & Physical Sciences**

Course Prefix & Suffix: \_\_\_\_\_

Core Objective: **Empirical and Quantitative Skills**—to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

*Student Learning Outcome supporting core objective:*

*For each core objective, there must be at least two different methods of assessment.*

SLO Status	Student Learning Outcome (SLO)	Learning Activity	Assessment
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Department Head: \_\_\_\_\_

Date: \_\_\_\_\_



**Core Curriculum Review Form**

Foundational Component Area: **Life & Physical Sciences**

Course Prefix & Suffix: \_\_\_\_\_

Core Objective: **Teamwork**—to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

*Student Learning Outcome supporting core objective:*

*For each core objective, there must be at least two different methods of assessment.*

SLO Status	Student Learning Outcome (SLO)	Learning Activity	Assessment
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Department Head: \_\_\_\_\_

Date: \_\_\_\_\_