

Administrative Master Syllabus

Course Information

Course Title	College Physics II
Course Prefix, Num. and Title	PHYS 1402
Division	Math & Physical Sciences
Department	Physics & Engineering
Course Type	Academic WCJC Core Course
Course Catalog Description	Continuation of PHYS 1401. Fundamental principles of physics, using algebra and trigonometry; the principles and applications of electricity and magnetism, including circuits, electrostatics, electromagnetism, waves, sound, light, optics, and modern physics topics; with emphasis on problem solving. Laboratory activities will reinforce these concepts.
Pre-Requisites	PHYS 1401 with a grade of "C" or better
Co-Requisites	None

Semester Credit Hours

Total Semester Credit Hours (SCH): Lecture Hours:	4:3:2
Lab/Other Hours	
Equated Pay Hours	4.2
Lab/Other Hours Breakdown: Lab Hours	2
Lab/Other Hours Breakdown: Clinical Hours	0
Lab/Other Hours Breakdown: Practicum Hours	0
Other Hours Breakdown	0

Approval Signatures

Title	Signature	Date
Department Head:	<i>Rocio Doherty</i>	12/14/23
Division Chair:		12-15-2023
VPI:		

Additional Course Information

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

Lecture Outline:

Syllabus and Class Introduction

- CH18 Electric Forces and Electric Fields
- CH19 Electric Potential Energy and the Electric Potential
- CH20 Electric Circuits
- CH21 Magnetic Forces and Magnetic Fields
- CH22 Electromagnetic Induction
- CH23 Alternating Current Circuits
- CH24 Electromagnetic Waves
- CH25 The Reflection of Light: Mirrors
- CH26 The Refraction of Light: Lenses and Optical Instruments
- CH27 Interference and the Wave Nature of Light

Laboratory Outline: Each offering of this course must include 11-13 experiments selected from the below list.

Syllabus and Lab Orientation

- 17 Use of Multimeter and Power Supply
- 18. Static Electricity
- 19. Electric Field Mapping
- 20. Ohm's Law
- 21. Series and Parallel Circuits
- 22. Kirchhoff's Laws in DC Circuits
- 23. Capacitors
- 24. Magnetic Field Mapping
- 25. Magnetic Force on a Wire
- 26. Magnetic Field in a Coil
- 27. Faraday's Law: Moving Magnet
- 28. Image Formation in a Plane Mirror
- 29. Law of Refraction
- 30. Converging Lens
- 31. Two-Slit Interference

Course Learning Outcomes:

Learning Outcomes – Upon successful completion of this course, students will:

Lecture:

1. Solve problems involving the inter-relationship of fundamental charged particles, and electrical forces, fields, and currents.
2. Apply Kirchhoff's Rules to analysis of circuits with potential sources, capacitance, inductance, and resistance, including parallel and series capacitance and resistance.
3. Solve problems in the electrostatic interaction of point charges through the application of Coulomb's Law.
4. Solve problems involving the effects of magnetic fields on moving charges or currents, and the relationship of magnetic fields to the currents that produce them.
5. Use Faraday's and Lenz's laws to determine electromotive forces and solve problems involving electromagnetic induction.
6. Articulate the principles of reflection, refraction, diffraction, interference, and superposition of waves.

7. Describe the characteristics of light and the electromagnetic spectrum.

Laboratory:

1. Develop techniques to set up and perform experiments, collect data from those experiments, and formulate conclusions from an experiment.
2. Demonstrate the collections, analysis, and reporting of data using the scientific method.
3. Record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.
4. Solve problems involving the inter-relationship of fundamental charged particles, and electrical forces, fields, and currents.
5. Apply Kirchhoff's Rules to analysis of circuits with potential sources, capacitance, inductance, and resistance, including parallel and series capacitance and resistance.
6. Solve problems in the electrostatic interaction of point charges through the application of Coulomb's Law.
7. Solve problems involving the effects of magnetic fields on moving charges or currents, and the relationship of magnetic fields to the currents that produce them.
8. Use Faraday's and Lenz's laws to determine electromotive forces and solve problems involving electromagnetic induction.
9. Solve problems applying the principles of reflection, refraction, diffraction, interference, and superposition of waves.
10. Solve practical problems involving optics, lenses, mirrors, and optical instruments.

Methods of Assessment:

Outcomes assessed by:

Final exam, tests, quizzes, class work and homework assignments

Lab outcomes assessed by:

Lab exam and lab reports

Required text(s), optional text(s) and/or materials to be supplied by the student:

James S. Walker. *Modified Mastering Physics* with Pearson eText + Standalone Access Card -- for Physics, 5th Edition. (ISBN: 978-0-1340-1972-7)

College Physics Lab Manual, 1st Edition, Wharton County Junior College; (ISBN: 978-1-5339-0863-6)

Scientific calculator (optional at Instructor's discretion)

Students must have computer access to the WCJC website, their WCJC student email and online accounts. WCJC has open computer labs, with internet access, on all campuses for students to use.

Suggested Course Maximum:

36

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

Physics laboratory classroom required for the lab component of the course

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

Lecture Average:	
Exam Average (3-4 exams)	30-55%
Other (homework, quizzes, projects, attendance, class work, etc.)	0-25%
Laboratory Average (based on lab avg below)	25%
Final Exam (includes at least 50% comprehensive material)	20-25%
	100% course total
Laboratory Average*:	
Lab Reports	20-75%
Other (lab notebook, pre-lab assignments, quizzes, etc.)	20-80%
Lab exam	5-25%
	100% lab total

*Department policy: A student must earn a 60% laboratory grade or greater to pass the course.

The overall course grade is assigned as specified by the college:

- A = 90–100
- B = 80–89
- C = 70–79
- D = 60–69
- F = below 60

Curriculum Checklist:

- Administrative General Education Course** (from ACGM, but not in WCJC Core) – No additional documents needed.
- Administrative WCJC Core Course** – Attach the Core Curriculum Review Forms
 - Critical Thinking
 - Communication
 - Empirical & Quantitative Skills
 - Teamwork
 - Social Responsibility
 - Personal Responsibility
- WECM Course** – If needed, revise the Program SCANS Matrix and Competencies Checklist

Core Curriculum Review Form

Foundational Component Area: Core 030: Life & Physical Science

Course Prefix & Suffix: PHYS 1402

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
State Mandated	(Lecture SLO #4) Solve problems involving the effects of magnetic fields on moving charges or currents, and the relationship of magnetic fields to the currents that produce them.	Lecture and laboratory experiment (Magnetic Field in a Coil)	Lab report, exam
State Mandated	(Laboratory SLO #1) Develop techniques to set up and perform experiments, collect data from those experiments, and formulate conclusions from an experiment.	Lecture and laboratory experiment (Magnetic Field in a Coil)	Lab report, exam
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	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.

Core Curriculum Review Form

Foundational Component Area: Core 030: Life & Physical Science

Course Prefix & Suffix: PHYS 1402

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
State Mandated	(Lecture SLO #4) Solve problems involving the effects of magnetic fields on moving charges or currents, and the relationship of magnetic fields to the currents that produce them.	Lecture and laboratory experiment (Magnetic Field in a Coil)	Lab report, exam
State Mandated	(Laboratory SLO #3) Record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.	Lecture and laboratory experiment (Magnetic Field in a Coil)	Lab report, exam
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	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.

Core Curriculum Review Form

Foundational Component Area: Core 030: Life & Physical Science

Course Prefix & Suffix: PHYS 1402

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
State Mandated	(Lecture SLO #4) Solve problems involving the effects of magnetic fields on moving charges or currents, and the relationship of magnetic fields to the currents that produce them.	Lecture and laboratory experiment (Magnetic Field in a Coil)	Lab report, exam
State Mandated	(Laboratory SLO #1) Develop techniques to set up and perform experiments, collect data from those experiments, and formulate conclusions from an experiment.	Lecture and laboratory experiment (Magnetic Field in a Coil)	Lab report, exam
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	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.

Core Curriculum Review Form

Foundational Component Area: Core 030: Life & Physical Science

Course Prefix & Suffix: PHYS 1402

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
State Mandated	(Lecture SLO #4) Solve problems involving the effects of magnetic fields on moving charges or currents, and the relationship of magnetic fields to the currents that produce them.	Lecture and laboratory experiment (Magnetic Field in a Coil)	Lab report, exam
State Mandated	(Laboratory SLO #1) Develop techniques to set up and perform experiments, collect data from those experiments, and formulate conclusions from an experiment.	Lecture and laboratory experiment (Magnetic Field in a Coil)	Lab report, exam
Choose a SLO status.	Insert SLO (from Administrative Master Syllabi)	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.