# COLLEGE PHYSICS II: Physics 1402-01

Syllabus Fall 2011 (Aug 23 - Dec 8: TTh lectures)

Department: Physics Course Title: College Physics II Course Reference Number (CRN): 91384 Course Number: PHYS 1402 Section: 01

*College Physics II* is algebra based course designed for majors in the physical or natural sciences and is a continuation of PHYS 1401, where emphasis is placed upon problem solving and conceptual understanding of physical principles. The emphasis in PHYS 1402 is Electrostatics & Electric Current, Magnetism, Optics, and Modern Physics.

**Prerequisite**: PHYS 1401, or instructor approval.

- Instructor: Dr. Jan Fiala Office: 208 A Telephone: (409) 880 7876 E-mail: jan.fiala@lamar.edu
- Lectures: T, Th 8:00 a.m. 9:15 p.m. in Archer 107
- Laboratory: Wednesday in Archer 113 12:30 p.m. – 02:30 p.m., section 11 with Dr. Jan Fiala 02:30 p.m. – 04:30 p.m., section 12 with Dr. Jan Fiala

Office Hours: M,T,W,Th,F: 9:15-11:00; M, W, F: 11:00-12:00 in Archer 208 A or by appointment

Help sessions: M, T, W, Th: 12:00-5:00 p.m., F: 12:00-3:00 p.m. in Archer 110

**Text:** Serway, R. A., Vuille, C. (2012). *College physics* (9<sup>th</sup> ed.). Cengage. ISBN: 9781111876050.

Laboratory Manual: Bahrim, C. (2010). *Laboratory Manual: College Physics* 2 – *PHYS* 1402. Available at Lamar University Bookstore <u>http://lamar.bncollege.com</u>

**WebAssign (online Homework):** It should come with your new textbook. Our university bookstore has the codes attached to new books and it also sells the codes separately in the case you already have the book. Finally, you can purchase WebAssign access code with the textbook included as e-book. See **Homework** below.

**Course Objective:** The goal of this course is to teach the basic concepts of electromagnetic phenomena, optics, and to learn how to apply these ideas in understanding various physics situations. You are expected to be able to apply mathematics such as algebra and trigonometry in order to solve physics problems.

#### **Important Dates:**

LAST DAY TO DROP (NOT WITHDRAW) WITH REFUND: Wednesday, September 7 LAST DAY TO DROP OR WITHDRAW WITH Q/W: Monday, September 26 LAST DAY TO DROP OR WITHDRAW WITH PENALTY: Monday, October 31 NO-CLASS DAYS: Monday, Sep 5, and Thursday-Friday, Nov 24-25 Exam 1: Thursday, September 15 Exam 2: Thursday, October 13 Exam 3: Thursday, November 17 Final Exam: Thursday, December 8<sup>th</sup> - Archer 107 at 8:00 a.m. - 10:30 p.m.

#### Grading System:

A student's final grade percentage will be calculated with the following weights:

Exams (3)	<b>45</b> %
Homework	15%
Quizzes	5%
Lab	10%
Final Exam	25%

Letter grades for the course will be assigned accordingly: >90% A, 80%-90% B, 70%-80% C, 60%-70% D, <60% F

### The Instructor reserves the right to alter the grading system as long as students' grades are improved.

Exams (70% =25%+45%): Exams will emphasize the material in the chapters/sections and labs (see the list of labs below). The exams will consist of multiple choice/short answer questions and problems. Both quantitative and conceptual questions will be asked. The problems will be similar to problems solved in class or in HW. Exam points will count for 70% of your final grade. No books, lecture notes, or information stored on electronic devices may be used during the exam. You can make one page A4 (210 × 297 in mm) with equations, constants, and laws of physics specifically for the exam. It is not allowed to include any notes related to homework, solutions of test bank problems or any intermediate steps for solving problems related to the exam. Your instructor may check your notes during the exam or after the exam. Please, ask your instructor if you are not sure what can be included on your notes for the exam. A simple scientific calculator is required. The exams will be held in room A108, in the physics building, in the same time interval of a regular lecture – first three exams (45%). The final exam takes two and half hours (25%) – see the important dates above. No make-up exams will be given. If you must miss an exam for a legitimate reason and you notify me of the situation within two days of the exam date, I will not count that exam toward your final grade. However, you may miss only one exam during the semester. Written proof for the reason of missing an exam should be given. The final exam is mandatory and will include all the material taught in lectures and labs from units 1, 2, 3, and 4.

**Homework (15%):** I am happy to use the WebAssign system for this course. The WebAssign gives you an immediate feedback about answers to homework problems, helping you to assess how well you understand a given topic. The WebAssign also encourages you to make several attempts at solving problems by giving you full credit for a correct answer even if it takes you a few tries to get it. The WebAssign provides you with an integrated suite of learning resources. All this turns the WebAssign into a tremendous tool for identifying weak areas in your understanding in a timely way.

The WebAssign assignments will have completion deadlines every Sunday at 11:59 p.m. This will keep you current with course material and allow you to recognize gaps in your understanding as soon as possible.

Diligent students can earn all the available points from homework. Homework points will count for 15% of your final grade. Any student who does not reach at least 50% of all possible points from online assignments will not pass the course and will receive the grade F for the Phys 1401 course!

How to work with WebAssign: Go to Blackboard and click on the WebAssign link.

### Purchasing WebAssign Access

- Purchase access online with a credit card or with a check and a valid PayPal account.
- Use a WebAssign access code card if it is included with your new textbook.
- Purchase WebAssign access code cards at many campus bookstores. You are granted access to your class without payment during a 14-day grace period from the class start date.

#### ENTERING ACCESS CODES

**Important:** To confirm that your access codecard prefix is valid for your class before you open it, or to look up the access code card prefix you need for your class, go to www.webassign.net/user\_support/student/cards.html.

1 Log in to WebAssign and select your class.

### 2 Select enter an access code.

3 Select your access code prefix from the **Choose your access code prefix** list.

4 Enter your access code in the boxes and click **Continue**.

**Quiz (5%):** The instructor will occasionally administer quizzes over current course material. In accordance with the mandatory attendance policy outlined below, it is the student's responsibility to be present for quizzes. There is no make-up quiz!

**Laboratory** (10%): There is a laboratory associated to this course. The laboratory activities are mandatory for everybody. The goals of this laboratory activity are:

- to verify and discover some important physical principles and concepts

- to learn experimental techniques for making precise measurements and to analyze possible errors arising from the practical limits of measurements

- to learn how to use various laboratory apparatus

There are 10 mandatory labs, with 10 points per lab. Lab points will count for 10% of your final grade. Any student who does not complete at least 6 labs will not pass the course and will receive the grade F for the Phys 1402 course. You need to keep all the handouts, graphs and calculations done for each lab in a folder. This folder will be checked by your professor in the end of the semester. It is your responsibility to keep all your lab handouts and reports. Failure to present a complete lab folder will drop your laboratory score with 2 points for each missing lab. Remember that you need to know the labs for the exams. In some

labs we are going to solve problems and the goal is to give you better understanding of physics we have discussed earlier in the lecture and to prepare you for exams. Full credit for the lab is given only if all requirements for the lab are fulfilled and all the problems are solved correctly. Keep in mind that the labs give you the best opportunity to get help and improve your understanding of covered material in our lectures. Try to use the time allocated for the laboratory activities efficiently and come to each laboratory class prepared with the basic concepts related to the lab proposed for that week.

Attendance Policy: Students are expected to be on time to all physics 1402 lectures and labs. Students who arrive late may be denied admittance to class. If the student misses more than 30% of the lectures for any reason whatsoever, that student will not pass the Phys 1402 course. The instructor will enforce whatever steps are necessary to maintain the right of all students to an uninterrupted lecture. Pagers and cellular telephones have to be switched off.

**Professional Integrity:** In this course high professional standards, including ethical standards, are promoted. Plagiarism and cheating are serious offences. Any violation will result in a course grade of F. For more information, refer to the Academic Dishonesty policy in Lamar University handbook.

**Disabilities:** If you have any condition, such as a physical or learning disability, which will make it difficult for you to carry out work as I have outlined above or which will require academic accommodations, please, let me know during the first week of classes.

DATE	LECTURE ( CHAPTER )	LAB/PROBLEM SOLVING SESSION
UNIT	<b>*1</b> - Electrostatics and electric current	
week	1	
8/23	Course overview - Electric charges (15.1 - 2) & Electric	force ( 15.3 )
8/24	Vectors - Newton's law of Gravitation and Coulomb's law	PS
8/25	Electric field for point charges ( $15.4-5$ )	
week	2	
8/30	Electric potential & Equipotential surfaces (16.1 - 4)	
8/31	ELECTRIC FIELD LINES FOR AN ELECTRIC DIPOLE	L1
9/1	Conductors in electrostatic equilibrium (15.6,9) & Prob	LEMS - CHAPTERS 15 & 16
week	3	
9/6	CAPACITORS (I) $(16.6 - 10)$	
9/7	CAPACITORS	L2
9/8	CAPACITORS (II) & PROBLEMS – CHAPTER 16	
week	1	
9/13	REVIEW - CHAPTERS 15 & 16	PS
9/14	PREPARATION FOR EXAM 1	
9/15	<b>Exam #1</b> : CHAPTERS 15 – 16 AND L1 – L2	

### **UNIT#2** – **ELECTRIC CIRCUITS AND MAGNETISM**

WEEK 5		
9/20	ELECTRIC CURRENT & RESISTANCE & OHM'S LAW (17.1 - 6)	
9/21	OHM'S LAW - COMBINATION OF RESISTORS	L3
9/22	CIRCUITS (I): COMBINATION OF RESISTORS (18.1-3)	
WEEK 6		
9/27	CIRCUITS (II): KIRCHHOFF'S RULES (18.4-5)	
9/28	TEMPERATURE DEPENDENCE OF RESISTANCE	L4
9/29	MAGNETISM (I): MAGNETIC FORCE (19.1 – 6)	
WEEK 7		
10/4	MAGNETISM (II): CURRENT-CARRYING WIRES ( $19.7 \& 19.10$ )	
10/5	FINDING THE EARTH'S MAGNETIC FIELD	L5
10/6	FARADAY'S LAW OF INDUCTION AND LENZ'S LAW (20.1-7)	
WEEK 8		
10/11	REVIEW - CHAPTERS 17 – 20	
10/12	PREPARATION FOR EXAM 2	PS
10/13	<b>Exam #2</b> : Chapters 17 – 20 and L3 – L5	

### UNIT#3 - OPTICS

#### WEEK 9

10/18 Reflection and refraction (22.1 – 7)	
10/19 Refractive Index	L6
10/20 Mirrors I (23.1 - 3)	
WEEK 10	
10/25 Mirrors II	
10/26 Image formation with mirrors	L7
10/27 LENSES I (23.4-7)	
WEEK 11	
11/1 LENSES II	
11/2 Image formation with lenses	L8
11/3 PROBLEMS WITH MIRRORS AND LENSES	
WEEK 12	
11/8 INTERFERENCE $(24.1-3)$ & Diffraction $(24.6-8)$	
11/9 INTERFERENCE AND DIFFRACTION OF LIGHT	L9
11/10 Thin-film interference (24.4) & Polarization of light (24.9)	
WEEK 13	
11/15 Optical Instruments (25.1-3,6)	
11/16 preparation for Exam 3	PS
<b>11/17</b> Exam #3 : Chapters 22 – 25 and L6 – L9	
I NIT#4 - FI EMENTS OF MODERN PHYSICS	
WEEK 14	
11/22 Elements of Einstein's Theory of Relativity (26.1–7)	
11/23 PROBLEM SOLVING SESSION – SPECIAL RELATIVITY OR MAKE UP LAB	PS
11/24 THANKSGIVING HOLIDAY – NO CLASS	
WEEK 15	
11/29 Atomic Physics (28.1 – 5)	
11/30 Atomic spectroscopy. Spectrum of Hydrogen	L10
12/1 QUANTUM PHYSICS I ( $27.1 - 4$ )	
WEEK 16	
12/6 QUANTUM PHYSICS & ATOMIC PHYSICS (27.5-8 & 28.6-7)	
12/7 PREPARATION FOR FINAL EXAM	PS

Final Exam – comprehensive (details will be announced in class) Thursday, Dec 8, 2011, 8:00-10:30 a.m.

## LABORATORY SCHEDULE FOR PHYS 1402 - FALL 2011

Wednesday in Archer 113

12:30 p.m. – 02:30 p.m., section 11 with Dr. Jan Fiala

02:30 p.m. - 04:30 p.m., section 12 with Dr. Jan Fiala

1.	PROBLEM SOLVING SESSION - VECTORS	8/24	PS
2.	ELECTRIC FIELD LINES FOR AN ELECTRIC DIPOLE.	8/31	L1
3.	CAPACITORS.	9/7	L2
4.	PROBLEM SOLVING SESSION – PREPARATION FOR EXAM 1	9/14	PS
5.	OHM'S LAW. COMBINATION OF RESISTORS.	9/21	L3
6.	TEMPERATURE DEPENDENCE OF RESISTANCE.	9/28	L4
7.	FINDING THE EARTH'S MAGNETIC FIELD	10/5	L5
8.	PROBLEM SOLVING SESSION – PREPARATION FOR EXAM 2	10/12	PS
9.	REFRACTIVE INDEX.	10/19	L6
10.	IMAGE FORMATION WITH MIRRORS.	10/26	L7
11.	IMAGE FORMATION WITH LENSES.	11/2	L8
12.	INTERFERENCE AND DIFFRACTION OF LIGHT.	11/9	L9
13.	PROBLEM SOLVING SESSION – PREPARATION FOR EXAM 3	11/16	PS
14.	CONDUCTORS IN ELECTROSTATIC EQUILIBRIUM. (MAKE UP LAB)	11/23	PS
15.	ATOMIC SPECTROSCOPY. SPECTRUM OF HYDROGEN.	11/30	L10
16.	PROBLEM SOLVING SESSION – PREPARATION FOR FINAL EXAM	12/7	PS

The labs will include measurements, data analysis, and exercises related to the experimental *activity*.