**ABET COURSE SYLLABUS**

**PHY 2114 Physics for Scientists and Engineers II**

**Course Catalog Description:** This is the second in a two-semester calculus-based introduction to physics sequence covering the fundamentals of electricity, magnetism, and optics for students with majors in the sciences and engineering. Prerequisites: PHY 2014 (Physics for Scientists and Engineers I) and MATH 2333 (Calculus 2) or concurrent enrollment in MATH 2333.

**Instructor:** Mohamed Bingabr, Professor of Engineering and Physics

**Office Location:** Howell Hall 221B

**Phone: (**405)974-5718

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**Course Meeting Time:** MWF 9:00 am – 9:50 am

**Course Meeting Location:** Howell Hall 101

**Office Hours:** MWF 10:00 – 10:50, 3:00 – 3:50, and by appointment.

**Textbook:** University Physics, 13th Ed., by Hugh Young and Roger Freedman (Pearson, San Francisco, 2014).

**Laboratory:** You must be enrolled in a section of PHY 2114L which is the physics laboratory that accompanies this course. Departmental policy requires the lab to count as 15% of your grade for this course and also requires a course grade of F for anyone who receives a grade lower than 60% in the lab. The lab will meet at its scheduled time for an orientation session the first week.

**Attendance:** Regular attendance is expected. Material presented in lecture as well as the textbook will be included on exams. It is your responsibility to keep up with class lectures and announcements.

**Drill & Homework:** You must be enrolled in the section of PHY 2114D above which is the drill associated with this course. Because quizzes and graded worksheets will be administered during each drill, attendance of drill is required. Missed quizzes due to absences are not made up for any reason. To allow for unavoidable absences, the two lowest drill worksheets scores, two lowest quiz scores, and two lowest homework scores will be dropped. You will need to always bring your textbook to drill.

**Cell Phone & Laptop Policy:** All computers, cell phones, and other communications devices should be turned off and put away during lectures. Any such device out during an exam or quiz will be construed as an attempt to cheat on that exam and will terminate the exam at that point for that person.

**Course Learning Objective:** At the end of this course, students should be able to:

1. Understand Electric force due to charge;
2. Understand and analyze the relationship between charge, electric field, voltage, and current;
3. Understand and analyze the relationship between charge, magnetic field, and magnetic force;
4. Understand the nature of electromagnetic wave.
5. Understand and analyze light wave’s reflection, diffraction and its application with lenses.

**Topics Covered**:

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| --- | --- |
| **Subject** | **Reading** |
| Electric Charge and Electric Field | Ch 21 |
| Gauss’s Law | Ch 22 |
| Electric Potential | Ch 23 |
| Capacitance and Dielectrics | Ch 24 |
| Current, Resistance, and Electromotive Force | Ch 25 |
| Direct-Current Circuits | Ch 26 |
| Magnetic Field and Magnetic Forces | Ch 27 |
| Sources of Magnetic Field | Ch 28 |
| Electromagnetic Induction | Ch 29 |
| Inductance | Ch 30 |
| Alternating Current | Ch 31 |
| Electromagnetic Waves | Ch 32 |
| The nature and propagation of optics | Ch 33 |
| Geometric Optics | Ch 34 |
| Interference and Diffraction | Ch 35, 36 |

**Distribution of Points:**

Lab 15%

Homework 13%

Attendance 7%

Quizzes 15%

2 Tests 30%

Final Exam 20%

**Grading Scale:** A: 90-100; B: 80-89; C: 70-79; D: 60-69; F: 0-59

**COURSE EXPECTATION & CONDUCT:**

It is expected that each student will actually spend a total of 6 to 8 hours per week on the course (not including lecture times). I don’t expect you to memorize formulas but I expect you to understand them. So, you will be allowed to bring to the exam one sheet of paper that contains any relative formulas you might need, but make sure you know how to use them conceptually and not just mechanically. Should you miss a quiz or test due to illness or an emergency, you will be required to give advance notice or provide a doctor's excuse in order to be allowed to make-up on the tests and quizzes you missed. Make-up tests and quizzes are usually harder than the regular tests and quizzes given during the class.

**HOMEWORK:**

The reality is this: you will not truly understand the technical concepts by just paying attention to lectures and reading the materials and examples in the book. To truly understand physics and scientific concepts you have to solve the homework problems yourself even if you are struggling solving them. For this reason, regular homework assignments will be made. The quizzes will be similar to the homework problems.

**Computer Usage:** None

**Laboratory Resources:** None

**Laboratory Policy:** None

**Contribution of the course to the professional component**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **None** | **Low** | **High** |
| General Education | x |  |  |
| Mathematics |  |  | x |
| Basic Sciences |  |  | x |
| Laboratory Experience |  |  | x |
| Engineering Science |  | x |  |
| Engineering Design | x |  |  |

**Course Structure:** The class meets three times a week, 50 minutes each for total 3 credit hours.

**Student Information Sheet:**

http://www.busn.ucok.edu/academicaffairs/FORMS/StudentINFOSheetSyllabusSPRING04.pdf

## ***ADA STATEMENT:***

"The University of Central Oklahoma complies with Section 504 of the Rehabilitation Act of 1973 and the American with Disabilities Act of 1990. Students with disabilities who need special accommodations should make their requests by contacting the coordinator of Disability Support Services, Kimberly Fields at 974-2549. The office is located in the Nigh University Center, Room 415. Students should also notify the instructor of special accommodation needs by the end of the first week of class."

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| **Prepared by:** | Mohamed Bingabr, Professor of Engineering and Physics |
| **Date:** | August 17, 2015 |