NAU NORTHERN ARIZONA UNIVERSITY

Course Title: PHY 331 Electricity And Magnetism I
Term: Fall 2022
Instructor: TBA
Course Credit: 3
Mode of Instruction: Online

Course Description:

This course covers electrostatics, magnetostatics, Lorentz force, fields in matter, electromagnetic induction. The laboratory component of the course is an introduction to electronics where students will develop skills in building and debugging electrical circuits. Upon the completion, students will be able to demonstrate the following skills when analyzing situations involving electrostatic fields and potentials and their sources.

Course Prerequisites:

CS 122 Programming For Engineering And Science

PHY 263 University Physics III

Learning Outcomes:

By the end of the course, the student should be able to:

A. Understand electricity and magnetism on a level that uses standard mathematical tools;

B. Develop a conception of space and time adequate for understanding electrodynamics;

C. Perform quantitative calculations in situations involving electric and magnetic fields, and demonstrate knowledge of the relevant basic units, vector addition, and application of basic calculus;

D. Use simple laboratory demonstrations and computer simulations to explain the basic properties of electric and magnetic fields, and electrical circuits.

NAU NORTHERN ARIZONA UNIVERSITY

Course Material:

Hawkes, Robert Lewis, Iqbal, Javed, Mansour, Firas, Milner-Bolotin, Marina, Williams, Peter J, ***Physics for scientists and engineers : an interactive approach***, 2th, Nelson Canada, 2018.

Evaluation:

- Lab Reports [20%]
- Quizzes [20%]
- Mid-term Exam [25%]
- Final Exam [35%]

Description of the Evaluation tasks:

Assignment/ Essay/ ... : During the term, students will be required to finish several evaluation tasks within due date. All the tasks are linked with specific course topics/outcomes and will adequately assess students' competence and learning outcomes. Students are encouraged to meet with instructor about these tasks at any point.

Mid-term/ Final Exams/ Quiz/... : There may be periodic quizzes given at the beginning of lecture sessions; the feedback from these quizzes will monitor the progress of the learners and help to set learning priorities. There will be mid-term exam/ final exam for the course. They are the basic criteria for the evaluation of students' learning outcomes and final grade.

Grading Policy:

Students are supposed to finish each online lecture. Prior to each class, students should finish the required readings. During the class time, students are encouraged to make use of all relevant online course resources and communicate with the instructor. Students' grades are accumulated based on the cumulative evaluations.

Students' letter grade will be assigned according to the following scale:

A+ 90-100	A 85-89	A- 80-84
B+ 77-79	B 73-76	B- 70-72
C+ 67-69	C 63-66	C- 60-62
D+ 57-59	D 53-56	D- 50-52
F < 50		

Academic Integrity:

Students must strictly adhere to the university's academic integrity rule; and all essays, exams and any other form of academic assignments must adhere to these rules. Any form of plagiarism, cheating, or misappropriation of materials will be considered a violation of academic integrity and will be punishable by the university.

Withdrawal from the Course(s):

Students will be able to apply for a transfer or withdrawal within 3 days of the starting date of the course. If a withdrawal is applied for within 3 working days, the tuition fee will be fully refunded. After 3 days, the tuition fee will not be refunded. If a withdrawal is applied for in the first two weeks, it will be recorded as W (Withdraw) on the course transcript. After this initial two-week period, the class will be recorded as F (Fail).

Tentative Schedule:

Week 1

1	Mechanics
2	Introduction to Physics
3	Motion in one dimension
4	Gravitation

5	Fluids **Lab report#1**

Week 2

6	Waves and oscillations
7	Waves
8	Sound and interference
9	Rolling Motion **Quiz#1**
10	Thermodynamics

Week 3

11	Temperature and the zeroth law of thermodynamics
12	Heat, work, and the first law of thermodynamics
13	Equilibrium and Elasticity **Mid-term Exam**
14	Heat engines and the second law of thermodynamics
15	Capacitance **Lab report#2**

Week 4

16	Electricity, magnetism, and optics
17	Electric fields and forces
18	Electrical potential energy and electric potential
19	Capacitance
20	Magnetic Fields and Fundamentals of DC Circuits **Quiz#2**

Week 5

21	Modern physics
22	Fundamental discoveries of modern physics
23	Introduction to quantum mechanics
24	Introduction to Solid-State physics
25	**Final Exam**