



SAMUEL ADEGBOYEGA UNIVERSITY
OGWA, EDO STATE
COLLEGE OF BASIC AND APPLIED SCIENCES
DEPARTMENT OF MATHEMATICS AND PHYSICAL SCIENCES

Course Code: PHY 122

Course Title: GENERAL PHYSICS II (Electricity, Magnetism and Modern Physics)

Status: 3 Credits Units (Core)

Semester: Second

Course duration: 2 hours Lecture; 1 hour Tutorial per week for 15 weeks (45 hours)

Time: Thursday 10:00 am - 12:00 pm; Friday 12:00 – 1:00 pm

Location: Physics Laboratory

Lecturer: Popoola, Felix A. **Tel:** 08060148600

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Office Location: Office 18, Department of Mathematics and Physical Sciences,
College of Basic and Applied Sciences

Office Hours: Tuesday 1:00 - 3:00 pm; Thursday 12:00 – 2:00pm

A. INTRODUCTION:

This course is designed for students to recognize the conduction of electric charges in substances and fields. It will assist college students to understand the basic concepts, principles and theories of electromagnetism and modern physics. Consequently, the course will make the students capture diverse areas of applications.

B. COURSE OBJECTIVES

At the end of the course, the students should have understood the following:

1. The concepts of static electricity.
2. Capacitance of a capacitors.
3. The concepts of flow of current in conductors and Ohm's law.
4. The concepts of the magnetic field
5. Electromagnetic forces and Maxwell's laws
6. The structure of atom and composition.
7. Solving simple mathematical problems relating to Electricity, Magnetism and Modern Physics.

C. COURSE CONTENT

Electrostatics: Electric charge, conductor, an insulator, electric current, Ohm's law, resistivity, conductivity. Coulomb's law, permittivity, electric field, electric lines of forces, properties of lines of force, electric field intensity. Electric flux, the field around a straight conductor, charged sphere and parallel plates. Gauss's law and its applications. Electric potential, the potential at a point due to a point charge, potential difference between two points, potential gradient, the relation between potential gradients and electric field. Dielectric strength and breakdown potential.

Magnetism and induction: Magnetic field, magnetic lines of force, magnetic flux and flux density of solenoid, straight conductor and narrow circular coil. Force acting on a current carrying conductor in a magnetic field, torque, Maxwell's equation.

Modern physics: Atomic structure, Blackbody radiation, photon energy, photoelectric effect, X-rays.

D. COURSE OUTLINE

Week	Topic
1 - 2	Electric field and electrostatics
3 – 4	Electric potential
5	Current electricity
6	Capacitance
7 – 8	Magnetic field and electromagnetic induction
9	Maxwell's equation
10 – 12	Modern physics
13	Revision

E. COURSE DELIVERY METHODOLOGY:

Face to face Lecture method.

F. METHOD OF GRADING

Attendance –	5%
Un-announced quizzes -	5%
Mid-Semester Test -	10%
Assignment –	10%
Examinations -	70%
Total	100%

Assignment: Weekly assignments will be given to students. The date for submission will be announced.

Course Requirements: A student must have nothing less than 75% attendance at lectures to be qualified to write the semester examination.

G. GROUND RULES AND REGULATIONS

1. University guidelines on attendance requirements will be strictly observed in this course. Thus, attendance as well as participation is a prerequisite and count for 10% of students' overall grade.
2. No student will be allowed into the lecture hall 5 minutes after the lecture must have commenced.

3. Improper and indecent dressing will not be allowed in the lecture hall.
4. Students are expected to be well disciplined and they should exhibit this through their punctuality at lectures and prompt attendance to class assignments.

H. ALIGNMENT WITH SAU VISION/MISSION/CORE VALUES/GOALS

Samuel Adegboyega University has the vision of becoming a world class university. For this to happen, Department of Mathematics and Physical Sciences must be the flagship.

I. RECOMMENDED TEXTS:

1. Michael Nelkon and Philip Parker (1995). *Advanced Level Physics* (5th ed.). London: Heinemann.
2. Serway, R. A. and Faughn, J. S. (2006). *Physics*. United States of America: Holt, Rinehart and Winston.
3. Jewett, J. W. and Serway, R. A. (2008). *Physics for Scientists and Engineers*. Bermount: Thompson Higher Education

Note: All reference materials are available in the central library.