



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

**Course Code:** PHY 222

**Course Title:** WAVES & OPTICS

**Status:** 3 Credits Units (Core)

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

**Lecturer Details:** Popoola, Felix A.

**INTRODUCTION:**

This course is designed for students to build up the conceptual understanding of the concepts in waves and optics. This helps the students to develop problem solving skills. It further provides the necessary basis knowledge to understanding the higher level courses.

**GENERAL OBJECTIVES**

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

1. The concepts of wave phenomenon.
2. The principles and applications of reflection and refraction at optical lenses.
3. The basic knowledge of physical optics.

**COURSE CONTENT**

Wave phenomena: Acoustic waves; the harmonic oscillator; waves on a motion; longitudinal waves; standing waves; group and phase velocity; Doppler effect. Physical optics: spherical waves; interference and diffraction; dispersion and scattering. Geometric thin lenses; optical lenses; mirror and prisms.

**COURSE DETAILS**

**Week 1-3: Wave phenomena**

Acoustic waves; the harmonic oscillator; waves on a string; energy in wave motion; longitudinal waves; standing waves; group and phase velocity.

**Week 4: Doppler's effect**

**Week 5-7: Geometric optics**

Waves and rays; reflection at a spherical surface; thin lenses; optical lenses; mirror and prisms.

**Week 8-11: Physical optics**

Spherical waves; interference and diffraction; thin films; crystal diffraction; holography; dispersion and scattering.

**Week 12: Revision**

**COURSE DELIVERY METHODOLOGY:**

Face to face Lecture method.

**COURSE ASSESSMENT:**

Continuous assessment -30 %

Examinations -70%

Total 100%

**CONTINUOUS ASSESSMENT**

Attendance – 5%

Assignment – 10%

Test - 15%

**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.

**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. Guar R. K. & Gupta S. L. (2001). *Engineering Physics (8th ed.)*. New Delhi: Dhanpat Rai

**Note:** All reference materials are available in the University Library.

**OFFICE LOCATION:** Office 18, Department of Mathematics and Physical Sciences,  
College of Basic and Applied Sciences

**LECTURE ROOM:** A112 Lecture Room II

**LECTURE HOURS:** Tuesday 12:00 noon – 1:00 pm; Friday 8:00 am - 10:00 am

**OFFICE HOURS:** Tuesday 1:00 - 3:00 pm; Thursday 12:00 – 2:00pm

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