# THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

## *Department of Physics*

# PHY 207 – Experimental Physics I

## COURSE PARTICULARS

**Course Code:** PHY 207
**Course Title:** Experimental Physics I
**No. of Units:** 1
**Course Duration:** Three hours of practical per week for 15 weeks
**Status:** Compulsory
**Course Email Address:** phy208@futa.edu.ng
**Course Webpage:** www.phy.futa.edu.ng
**Prerequisite:** PHY 107, PHY 108

## COURSE INSTRUCTORS

**Dr. (Mrs.) O.P. Faromika (Coordinator)**
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*Dept. of Physics,*
*Federal University of Technology, Akure, Nigeria.*
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## COURSE DESCRIPTION

This is a laboratory course that consist of group of experiments drawn from diverse area of Physics (Optics, Mechanics, Modern Physics etc) i.e experiments on the determination of moments of inertia, of a bar using bifilar suspension, determination of the moment of inertia of a flywheel, principles of moment, principles of kinematics, spiral spring, determination of acceleration due to gravity by means of compound pendulum, coefficient of static and dynamic friction for wood, determination of the refractive index of a prism, determination of the focal length of an inaccessible converging lens by Newton's method, determination of the focal length of a converging lens by location of virtual Images, determination of the focal length of a converging lens by self conjugate method.

Determination of the focal length of a diverging lens using a concave mirror and a diverging lens, Determination of the focal length of a converging lens by displacement method, determination of the focal length of a convex mirror using a plane mirror and a converging mirror.

# COURSE OBJECTIVES

The objectives of this course are to:

- help student to develop some manipulative skills in handling some physics apparatus. to reinforces some, if not all, the principles, theories and concepts that students must have learnt in Optics, Mechanics and Properties of Matter.
- enable students determine some physical constants such as acceleration due to gravity, specific heat capacity of a solid or liquid, force constant of a spiral spring to mention a few.
- show you how to:
    - Identify the two physical quantities to be measured as the variables - the independent and dependent variables;
    - Determine the relationship between the two variables in form of a graph.

## COURSE LEARNING OUTCOMES / COMPETENCIES

Upon successful completion of this course, the student will be able to:
*(Knowledge based)*

- understand the principles of moment and kinematics.

- identify the two physical quantities to be measured as independent and dependent variables;
- determine the relationship between the two variables in form of a graph.
- reinforces some, if not all, the principles, theories and concepts you must have learnt in Optics, Mechanics and Properties of Matter.

*(Skills)*

- determine some physical constants such as acceleration due to gravity, force constant of a spiral spring,
- determine moments of inertia of a flywheel determine the coefficient of static and dynamic friction for wood.
- determine the refractive index of a prism and the focal length of converging and diverging lenses using different methods.

## GRADING SYSTEM FOR THE COURSE

This course will be graded as follows:

| | |
|---|---|
| Class Attendance | 10% |
| Practical/Attendance | 40% |
| Final Examination | 50% |
| **TOTAL** | **100%** |

## GENERAL INSTRUCTIONS

***Attendance:*** It is expected that every student will be in class for the introductory and all the practical classes. Attendance records will be kept and used to determine each person's qualification to sit for the final examination. In case of illness or other unavoidable cause of absence, the student must communicate as soon as possible with any of the instructors, indicating the reason for the absence.

***Academic Integrity:*** Violations of academic integrity, including dishonesty in the report of experiments, examinations, or other academic performances are prohibited. You are not allowed to make copies of another person's work and submit it as your own. All cases of academic dishonesty will be reported to the University Management for appropriate sanctions in accordance with the guidelines for handling students' misconduct as spelt out in the Students' Handbook.

***Practical Worksheet:*** Students are expected to submit their practical worksheet at the end of every practical session. Failure to submit will earn you zero for that particular practical session. Only under extenuating circumstances, for which a student has notified any of the instructors in advance, will late submission of assignments be permitted.

***Code of Conduct in the Laboratories:*** Students should turn off their cell phones during lectures. Students are prohibited from engaging in other activities (such as texting, watching videos, *etc*.) during practical sessions. Food and drinks are not permitted in the laboratories.

***Getting Set for the Practical***

- You are supposed to read the experiment, as many times as possible so that you know how you will carry it out.
- Make sure that you assemble all the apparatus required from the Laboratory Technologist and set up the apparatus carefully and neatly on the working bench.
- Examine the apparatus very well before the commencement of the experiment to ensure that they are working well.
- Do not form the habit of writing on scraps of paper, use your notebook straight to contain all observations and calculations.

***Report of Experiments***

The report of each experiment should include the following in the right order.

- Date when the experiment was performed
- The aim or purpose of the experiment
- Table of observations
- Graph
- Calculation of slope or the constant
- Estimation of errors where necessary
- Precautions
- Conclusion

## READING LIST

Department of Physics, FUTA (2013) 'Physics 207 practical Manual'[1]

***Legend***

1- Available in the Department

## COURSE OUTLINE

| Week | Topic | Remarks |
|---|---|---|
| 1 | • Introductory practical class | Every student should attend this class in which the will be taught the theory of the practical |
| 2 | • Introductory Practical class | Every student will be divided into groups for the weekly experiment. |
| 3&4 | experiments on the determination of moments of inertia, of a bar using bifilar suspension, | From this week and in subsequent ones, students will be required to carry out the experiment to which they are assigned. |

| | | |
|---|---|---|
| | determination of the moment of inertia of a flywheel, principles of moment, principles of kinematics, spiral spring, | |
| 5&6 | determination of acceleration due to gravity by means of compound pendulum.<br><br>Determination of coefficient of static and dynamic friction for wood. | |
| 7 & 8 | determination of the refractive index of a prism | |
| | | Mid semester test |
| 9 & 10 | determination of the focal length of an inaccessible converging lens by Newton's method<br><br>determination of the focal length of a converging lens by location of virtual Images. | |

| | | |
|---|---|---|
| 11 & 12 | determination of the focal length of a converging lens by self conjugate method.<br><br>Determination of the focal length of a diverging lens using a concave mirror and a diverging lens, | |
| 13 & 14 | Determination of the focal length of a converging lens by displacement method<br><br>determination of the focal length of a convex mirror using a plane mirror and a converging mirror. | |
| 15 | Make up Practical Classes | |