



THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

Department of Physics

PHY319 – Electronics Practical I

Course Code: PHY 319
Course Title: Electronics Practical I
No. of Units: 1
Course Duration: Three hours of practicals for 15 weeks.
Status: Compulsory
Course Email Address: kdadedayo@futa.edu.ng
Course Webpage: <http://www.fwt.futa.edu.ng/courseschedule.php?coursecode = PHY319>
Prerequisite: Nil

COURSE INSTRUCTORS

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COURSE DESCRIPTION

This course is a practical based course designed for students in Physics Electronics, and allied disciplines. The course deals with topics such as I-V Characteristics of the diode. Rectifier circuits: Half-wave, full wave and full wave bridge rectifier circuits. DC – to – DC converters, buck converter, wave-shaping circuits: clamping circuits, clipping circuits, voltage transfer characteristics of the diode; photo diode, photo detectors, LEDs, LDR, Forward current transfer ratio, silicon control rectifier, Transistor as a switch.

COURSE OBJECTIVES

The objectives of this course are to:

- introduce students to the construction of circuits, hence students are expected to understand how to draw and interpret an already drawn circuits, be able to connect the circuit using the component(s) provided; and
- provide students with opportunities to develop basic skills in the design and construction of electronic circuits.

COURSE LEARNING OUTCOMES / COMPETENCIES

Upon successful completion of this course, the student will be able to:

(Knowledge based)

- identify various practical applications of diodes: rectification, regulation, conversion and wave shaping.
- explain the voltage transfer characteristics of the diode, photo diode, photo detectors, LEDs, LDR,
- explain forward current transfer ratio, silicon control rectifier, and the use of transistor as a switch.
- understand the basic design techniques of electronic circuits.

(Skills)

The students will

- be well grounded in transforming theoretical knowledge into practical applications.
- be able to use laboratory equipment such as cathode ray oscilloscope, function generators, multimeter etc for electronics application.

GRADING SYSTEM FOR THE COURSE

This course will be graded as follows:

Class Attendance	5%
Assignment(s)	15%
Class practical work	40%
<u>Final Examination</u>	<u>40%</u>
<u>TOTAL</u>	<u>100%</u>

GENERAL INSTRUCTIONS

Attendance: It is expected that every student will be in class for lectures and also participate in all practical exercises. 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 assignments, 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; that is plagiarism. 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.

Assignments and Group Work: Students are expected to submit assignments as scheduled. Failure to submit an assignment, as at when due, will earn you zero for that assignment. 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 lectures. Food and drinks are not permitted in the practical class.

READING LIST

¹Paul Scherz. (2000). Practical Electronics for Inventors. McGraw-Hill, USA, pp 123-280.

Legend

1- Available as Personal Collection

COURSE OUTLINE

Week	Topic	Remarks
1	Introduction and Course Overview	During this first class, the general overview of the course, rules and regulations for successful achievement in the course will be emphasized.
2 & 3	I-V Characteristics of the diode. Rectifier circuits: Half-wave, full wave and full wave bridge rectifier circuits.	Practical work includes typical applications of pn diode.
4 & 5	DC – to – DC converters, buck converter, wave-shaping circuits: clamping circuits, clipping circuits,	Practical work includes typical applications of pn diode with focus on clamping and clipping circuits
6- 8	Voltage transfer characteristics of the diode; photo diode, photo detectors, LEDs, LDR,	Practical work includes connection and use of various types of diodes: photo diode, photo detectors, LEDs, LDR,
9 & 10	Forward current transfer ratio, silicon control rectifier, Transistor as a switch.	Practical work includes connection and use of PNP transistors in common – emitter mode to determine its variation with changes in frequency and dc collector current.

11 & 12	Forward current transfer ratio, silicon control rectifier, Transistor as a switch.	Practical work includes investigation on the effect of external circuitry on the high frequency response of a common emitter transistor stage.
13 & 14	Forward current transfer ratio, silicon control rectifier, Transistor as a switch.	Determination of how circuit elements affect the low frequency response of an amplifier and to know the effects of these changes in the values of the elements.
15	REVISION	This is the week preceding the final examination. At this time, evaluation will be done to assess how far the students' expectations for the course have been met.