



**Course Descriptor
PHYS102 Physics II)**

Proposed Academic Year	2021-22	Last Reviewed Academic Year	2020-21
Course Code	PHYS102	Course Title	Physics II
Credit hours	3	Level of study	Undergraduate
College / Centre	CAHS	Department	DBS
Co-requisites		Pre-requisites	PHYS101

1. COURSE OUTLINE

[This course gives an understanding of the basic concepts of Physics which is fundamental for developing students' understanding in the field of Applied Science and Engineering. Physics 102 is a continuation of PHYS101 focusing on basic principles and concepts in Physics. It is designed for students who will continue their undergraduate degree programs in Engineering.

2. AIMS

[. The aim of this module is to lay a firm foundation for students in basic principles of Physics. The course will introduce students to the concepts of rotational dynamics, capacitance, magnetism, electromagnetic induction, waves, optics, heat and thermodynamics. It will develop verbal, mathematical, critical thinking and problem-solving skills.

3. LEARNING OUTCOMES, TEACHING, LEARNING and ASSESSMENT METHODS

Learning Outcomes (Definitive)	Teaching and Learning methods (Indicative)	Assessment (Indicative)
Upon successful completion of this course, students will be able to:		
1. Demonstrate an understanding of object's angular position, displacement, velocity and acceleration	Power point presentations , lectures and class activity	Written examinations, Assignment
2. Analyze the connection between temperature and internal energy	Power point presentations , lectures and class activity	Written examinations, Assignment
3. Define magnetic field and forces.	Power point presentations , lectures and class activity	Written examinations, Assignment
4. Describe how electric generators and transformers work.	Power point presentations , lectures and class activity	Written examinations, Assignment
5. Demonstrate an understanding of different phenomenon of light like interference, diffraction etc	Power point presentations , lectures and class activity	Written examinations, Assignment



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6. Develop analytical and critical thinking skills in problem solving.	Power point presentations , lectures and class activity	Written examinations, Assignment
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4. ASSESSMENT WEIGHTING

Assessment	Percentage of final mark (%)
Quizzes	30
Midterm Examination	20
Assignment	10
Final Examination	40
TOTAL	100%

5. ACHIEVING A PASS

Students will achieve **3** credit hours for this course by passing **ALL** of the course assessments [*alternatively, list the compulsory pass assessments**] and achieving a **minimum overall score of 50%**

NB *Ensure that ALL learning outcomes are taken into account

6. COURSE CONTENT (Indicative)

Rotational dynamics- angular displacement, velocity, acceleration, Momentum & torque. Translational & Rotational energy.	
Heat transfer, , first law of thermodynamics, heat conduction , second law of thermodynamics, heat engines	
Capacitance, Parallel plate capacitor, Capacitor in Series and parallel. Energy stored in a capacitor.	
Magnets, magnetic fields and forces, solenoids and electro magnets, ferromagnetism.	
Application - Cyclotron. Induced EMF, Faraday's laws and Lenz's law, electric generators, transformers, MIDTERM	
LR, LC , LCR circuits, resonance ,	
Waves, production of electromagnetic waves, electromagnetic spectrum. Applications.	
Light, Theories of light (particle, wave and EM Theories), Reflection	
Snell's law of refraction, total internal reflection and applications, Huygens principle.	
interference, diffraction, polarization and its applications.	
Energy bands in solids, conductors, insulators and semi-conductors, intrinsic and extrinsic semi-conductors, Pn junction construction & working, Biasing, diodes, Applications: Half Wave & Full Wave rectifiers. Transistor and logic gates.	
Revision	
TOTAL HOURS	45
Plus RECOMMENDED INDEPENDENT STUDY HOURS	15
TOTAL COURSE HOURS	60

7. RECOMMENDED REFERENCES

Core text/s:



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Walker James S (2016) Fifth edition Pearson international edition

Giancoli, Douglas C (2014) Physics: Principles with Application Seventh Edition Pearson Prentice Hall International edition

Library + online resources:

<http://www.physics.smu.edu/~scalise/apparatus/caliper/>

<http://www.technologystudent.com/equip1/microm1.htm>

http://physicscatalyst.com/elec/current_4.php

<http://hyperphysics.phy-astr.gsu.edu/hbase/electric/ohmlaw.html>

<http://moodle.asu.edu.om/course/view.php?id=8463>

Open Educational Resources:

<https://archive.org/stream/physics00paul#>

https://archive.org/stream/isbn_9780470379257#

https://openlibrary.org/works/OL2538490W/Fundamentals_of_physics