



DEPARTMENT OF PHYSICS

General Physics III-FALL 2020 (Term 201)

1. Instructor Details: Dr. Watheq Al-Basheer, PhD
Physics Department (6-231), KFUPM
E-mail: watheq@kfupm.edu.sa
Tel: 013-860-2216 Fax: 013-860-2293

2. Times and Locations: Lecture - UTR 09- :50, location 6-201 (Online)
Lab. - W 12:15 - 2:55, Location (Virtual lab)

3. Course Description & Objective:

Inductance; magnetic properties of matter, electromagnetic oscillations and waves; geometrical and physical optics. Relativity, introduction to quantum physics, atomic physics, solids, nuclear physics, particle physics and cosmology. Prerequisites: PHYS 102, MATH 102

The Lab component of General Physics III consists of selected experiments in electrical circuits, geometrical and physical optics as well as modern physics.
Co-requisite: PHYS 204

4. Textbook: "Fundamentals of Physics", by Halliday, Resnick and Walker, Eleventh Edition, John Wiley & Sons, Inc. (2018).

5. Attendance policy: DN grade will be given to student absences exceeding 12 lectures or 3 Labs or a combination.

8. Academic Integrity: Students are expected to be honest and to submit their own homework assignments and exams.

9. Grading Policy:

	<u>Percentage</u>
Assignments/quizzes	50%
Mid Term Exam (<i>CH30 – CH37, date and time TBA</i>)	20%
Final exam (<i>All covered topics, date and time TBA by Registrar</i>)	30%

PHYS 204 Chapters & Topics

CH.#	Chapter: Topics
30	Induction and Inductance: Faradays Law of Induction, Inductance, RL Circuits, Mutual Inductance.
31	Electromagnetic Oscillations and Alternating Current: LC Oscillations, RLC Circuits, Series RLC Circuits.
32	Maxwell's Equations: Magnetism of Matter: Gauss' Law for magnetic field, Maxwell's equations, Magnetic Materials.
33	Electromagnetic Waves: EM Waves (Qualitative and Quantitative Analysis), Energy Transport, Total Internal Refraction.
34	Images: Plane and spherical Mirrors, Spherical Refracting Surfaces and thin lenses.
35	Interference: Light as a wave and diffraction, Young's Interference experiment, Intensity in Double Slit Interference.
36	Diffraction: Diffraction & Wave Theory of Light, Diffraction by Double Slit, Diffraction Gratings.
37	Relativity: The postulates, Measuring and event, Relativity of Time and Length, Lorentz Transformation, Doppler Effect for Light
38	Photons and Matter Waves: Photon, The Quantum of Light, Photons Have Momentum Schrodinger's Equation.
39	More About Matter Waves: Energy of Trapped Electron, Two and Three Dimensional Trap, The Hydrogen Atom.
40	All About Atoms: Properties of Atoms, Pauli Exclusion Principle, Lasers
41	Conduction of Electricity in Solids: Electronic Properties, Metals, Semiconductors
42	Nuclear Physics: Some Nuclear Properties, Radioactive Decay, β Decay
43	Energy from the Nucleus: Energy from the Nucleus

PHYS 205 Grading Policy

	<u>Percentage</u>
Pre-lab quizzes	25%
Lab work (Reports)	40%
Presentation	10%
Lab Final	25%

PHYS 205 Virtual lab Schedule

Experiment	Date
Data and Error Analysis	09/09/2020
RC Circuit	09/16/2020
RLC Circuits	09/30/2020
Polarization of Light	10/07/2020
Thin Lens and Spherical Mirrors	10/14/2020
Refractive Index and Colors	10/21/2020
Michelson Interferometer	11/11/2020
Diffraction of Light	11/18/2020
Atomic Constants	11/25/2020
Radiation detection	12/02/2020

TIPS FOR GOOD LAB REPORT WRITING

This course will provide you with multiple opportunities to develop and foster your skills of conducting and reporting science.

- 1- Your lab report should be brief and to the point. You must say everything you need to say. You can either type your report or hand write it.
- 2- Fundamentally, there are five main sections to a scientific lab report: Experiment title and your name, Abstract (objectives), Results and discussions, answering all questions and then ending with conclusions.
- 3- Any symbol or expression used in your report must be defined. This includes any symbols or expressions in figures, diagrams and equations. Also figure captioning should be present for every figure.
- 4- Units should be consistent. Figures Axes should be well-defined with proper units.
- 5- If your experiment involves determining a physical constant, then you should include in your report calculation of the percentage error showing the deviation of your experimentally found value from the real and well-known one.
- 6- Whether your results and calculations agree very well with theory or not, you should comment on your results, giving scientific reasons and explanations on the agreement or the disagreement.