KOMAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
(KUST)

General Physics II			
Course Title	**General Physics II**		
Course Code	**PHY 1411C**	**No. of Credits**	**4**
Department	**All**	**College**	**Engineering**
Pre-requisites Course Code	**PHY 1410C**	**Co-requisites Course Code**	
Course Coordinator(s)	**(S1) Dr. Salah Aziz, Mr. Hazhar Rasull (S2) , and Dr. Mohammed Ibrahim (S3 and S4)**		
Email	**salah.aziz@komar.edu.iq m.Ibrahim@komar.edu.iq Hazhar.rasull@komar.edu.iq**	**Office No.**	**Dr. Mohammed Ibrahim:241 M. Hazhar Abdullah: 229**
Lab Instructors	**S1, S2, S3 M. Peshawa Omer and S4,S5 M. Hazhar Abdulla.**		
Tutorial Hours	**Thursday G – 13 – 14, From 14:00 to 16:00,**		
Class Hours	**S1 (8:009:30) M. W, S2 (14:00-15:30) M. W, S3 (10:00-11:30) S, T, S4 (16:00-17:30) S, T**		
Contact Hours	**Dr. Mohammed Ibrahim: (13:30-15:30) S,T M. Hazhar Abdullah : (16:00-18:00) M**		
Course Type	***Theory and Lab***		
Offer in Academic Year	**Spring 2016**		

COURSE DESCRIPTION

Course Description: General Physics II (4 c.h: 3 hrs theoretical and 3 hrs experiment): Pre-requisites: General Physics I and Calculus II. This course uses calculus-based mathematical models to introduce the fundamental concepts that describe the physical world. Topics include electrostatic forces, electric fields, electric potentials, direct-current circuits, magnetostatic forces, magnetic fields, electromagnetic induction, alternating-current circuits, and light.

Grade Distribution: 75% Theory
25% Experiment

Students will take practice session 3 hours a week through laboratory work. While the theoretical part will be 3 hours in class, 2 times per week.

COURSE OBJECTIVES

There are two objectives for this course:
1. Enabling students to learn about two subjects which have important role in developing the students' knowledge in general. The two subjects are: Electromagnetism and Optics, and
2. Enabling students to use physics laws in areas which contribute to students' career.

COURSE LEARNING OUTCOMES

After participating in the course, students would be able to:

1. Knowledge of Electromagnetism:

a) Students should be able to understand and answer conceptual questions related to electrical charges, and electrical and magnetic forces.

b) Students should be able to apply the concepts of electric fields and electric potential to relevant problems.

2. Knowledge of Optics:

c) Students should be able to understand and answer conceptual questions related to lens, mirrors and images forming.

3. Application:

d) Students should be able to compute (solve problems) quantities in electromagnetism

e) Students should be able to compute (solve problems) quantities in electric circuits

f) Students should be able to compute (solve problems) quantities in optics (Lenses and Mirrors)

4. Analysis of electric circuits:

g) Students should be able to analyze electric circuits and predict their functions.

5. Conducting Experiments

f) Students should be able to set and conduct experiments on electromagnetism and optics.

(Note: Experiments should be chosen based on their links to the Learning Outcomes.

GUIDELINES ON GRADING POLICY

Points	*Percentage Scores*	*Grade*
A	*95–100*	*4.0*
A-	*90-94*	*3.7*
B+	*87–89*	*3.3*
B	*83-86*	*3.0*
B-	*80-82*	*2.7*
C+	*75–79*	*2.3*
C	*70-74*	*2.0*
C-	*65-69*	*1.7*
D+	*60–64*	*1.3*
D	*55-59*	*1.0*
D-	*50-54*	*0.7*
F	*0–49*	*0*
I	*Incomplete Course Work*	
W	*Official Withdrawal*	

Note: The minimum passing grade to pass this course is C- which is equivalent to 65%.

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COURSE CONTENT

Course topics include:

1. Electric Charge and Electric Field
2. Gauss's Law
3. Electric Potential
4. Capacitance and Dielectrics
5. Current, Resistance, and Electromotive Force
6. Direct-Current Circuits
7. Magnetic Field and Magnetic Forces
8. Sources of Magnetic Field
9. Alternating Current
10. The Nature and Propagation of Light
11. Geometric Optics
12. Interference
13. Atomic and nuclear physics
14. Radiation protection

COURSE TEACHING AND LEARNING ACTIVITIES

Course Teaching and Learning Activities: (short description)

1. Contribution during the class discussions.
2. The lectures will be given to the students in PowerPoint slides.
3. White board will be used to give extra explanations as well as for solving problems.
4. There will be in class group work, where student will do in class exercises and turn the assignment to the instructor
5. A laboratory session will be offered to demonstrate the principles from lecture in the lab environment.

COURSE ASSESSMENT Tools

Assessment Tool (Weight)	Description
Homework (10%)	Conceptual: In class assignments covers one week materials
Quizzes (10%)	Application: bi-weekly quiz covers two weeks materials
2 Tests (20%)	Covers four weeks topics
Mid-Term Exam (20%)	Covers 7-8 weeks topics
Final Exam (40%)	Cumulative
Extra (10%)	Extra assignment designed by the instructors for special cases

ESSENTIAL READINGS: (Journals, textbooks, website addresses etc.)

Textbook:

University Physics with Modern Physics

Authors: Young and Freedman

Publisher: Addison-Wesley; 13 edition (2011)

ISBN-10: 0321696867

ISBN-13: 978-0321696861

References:

- Physics for scientists and engineers,
  by Tipler, 4th edition, ISBN: 1572594918,
- Fundamental of Physics,
  by Walker, 8th edition, ISBN: 0470044721,
- College Physics,
  by Geller and Young, 8th edition, ISBN: 0805378219.

COURSE POLICY *(including plagiarism, academic honesty, attendance etc)*

1- Lecture attendance is obligatory. The course notes and the textbook are not enough, The student should take notes as he/she is responsible for all material covered in lectures.

2- In case a student's miss classes, exams and quizzes without official permission, there will not be a make-up work for them. Otherwise they should talk with the faculty to make-up lost classes

3- Students are subject to the regulation and policies mentioned in the KUST Student Handbook.

GUIDELINES FOR SUCCESS

1. Work both independently and in groups of your peers, who can help you understand the course material.
2. Attend every lecture, discussion, and lab.
3. Try to interact with your class partner(s).
4. Try to stay active throughout the class period and take notes.
5. Don't hesitate to ask questions in class as well as during office hours.
6. Spend at least 2-3 hours each day for studying and doing homework.

Course calendar: Please check the academic calendar for 2015/2016

http://osar.komar.edu.iq/academic-calendar

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Date	Week	Subject	Activities
28 Feb– 03 Mar	**1**	**Chapter 21:** ELECTRIC CHARGE AND ELECTRIC FIELD • Electric Charge • Conductors, Insulators, and Induced Charges • Coulomb's Law • Electric Field and Electric Forces • Electric-Field Calculations • Electric Field Lines	
05 – 10 Mar	**2**	**Chapter 22:** GAUSS'S LAW • Charge and Electric Flux • Calculating Electric Flux • Gauss's Law • Applications of Gauss's Law • Charges on Conductors	
12 – 17 Mar	**3**	**Chapter 23:** ELECTRIC POTENTIAL • Electric Potential Energy • Electric Potential • Calculating Electric Potential • Equipotential Surfaces • Potential Gradient	
19 – 24 Mar	**4**	Nawroz Holliday	
26 – 31 Mar	**5**	**Chapter 24:** CAPACITANCE AND DIELECTRICS • Capacitors and Capacitance • Capacitors in Series and Parallel • Energy Storage in Capacitors and Electric-Field Energy • Dielectrics	
02 – 07 Apr	**6**	**Continue**	TEST # 1 (Chapters 21-24)
09 – 14 Apr	**7**	**Chapter 25:** CURRENT, RESISTANCE, AND ELECTROMOTIVE FORCE • Current • Resistivity • Resistance • Electromotive Force and Circuits • Energy and Power in Electric Circuits	
16 –21 Apr	**8**	**Chapter 26**: DIRECT-CURRENT CIRCUITS • Resistors in Series and Parallel • Kirchhoff's Rules • Electrical Measuring Instruments • R-C Circuits • Power Distribution Systems	

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Date	Week	Subject	Activities
23 – 28 Apr	**9**	**Midterm Exam Week (Chapters 21-26)**	
30 Apr– 05 May	**10**	**Chapter 27**: MAGNETIC FIELD AND MAGNETIC FORCES • Magnetism • Magnetic Field • Magnetic Field Lines and Magnetic Flux • Motion of Charged Particles in a Magnetic Field • Applications of Motion of Charged Particles • The Direct-Current Motor	
07 – 12 May	**11**	**Chapter 28**: SOURCES OF MAGNETIC FIELD • Magnetic Field of a Moving Charge, • Ampere's Law • Applications of Ampere's Law • Magnetic Materials	
14 – 19 May	**12**	**Chapter 31:** ALTERNATING CURRENT • Phases and Alternating Currents • Resistance and Reactance • The L-R-C Series Circuit • Power in Alternating-Current Circuits • Resonance in Alternating-Current Circuits • Transformers	TEST # 2 (Chapters 27, 28, 31)
21 – 26 May	**13**	**Chapter 33:** NATURE AND PROPAGATION OF LIGHT • The Nature of Light • Reflection and Refraction • Total Internal Reflection • Dispersion • Polarization • Scattering of Light	
28 May – 02 Jun	**14**	**Chapter 34:** GEOMETRIC OPTICS • Reflection and Refraction at a Plane Surface • Reflection at a Spherical Surface • Refraction at a Spherical Surface • Thin Lenses • Cameras • The Eye • The Magnifier • Microscopes and Telescopes	
04 – 09 Jun	**15**	**Chapter 35:** INTERFERENCE • Interference and Coherent Sources • Two-Source Interference of Light	
11 –16 Jun	**16**	**Chapters 41,43:** Atomic and Nuclear physics	

Date	Week	Subject	Activities
		Chapter 43 'continued': Radiation protection • Radioactivity and Radiation • Interaction of radiation with matter • Radiation detection and measurements • Biological effects of radiation • Radiation safety	
18 –23 Jun	**17**	Review Week	
25 – 30 Jun Final Exam (Chapters 21-43)			