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Course Syllabus

1	**Course title**	General Physics II
2	**Course number**	0302102
3	**Credit hours**	3
	Contact hours (theory, practical)	3 Theory
4	**Prerequisites/corequisites**	General Physics I (0302101)
5	**Program title**	Physics
6	**Program code**	
7	**Awarding institution**	The University of Jordan
8	**School**	Science
9	**Department**	Physics
10	**Course level**	1st year
11	**Year of study and semester(s)**	1st semester 2022/2023
12	**Other department(s) involved in teaching the course**	--
13	**Main teaching language**	English (Arabic limited)
14	**Delivery method**	☒Face to face learning ☒Blended ☐Fully online
15	**Online platforms(s)**	☒Moodle ☒Microsoft Teams ☐Skype ☐Zoom ☐Others……
16	**Issuing/Revision Date**	November 2022

17 Course Coordinator:

Name: *Faculty members at the Department of Physics*	Contact hours: *member dependent*
Office number: *specified member room*	Phone number: *faculty members*
Email: *faculty members*	

18 Other instructors:

Name:	*Faculty members at the Department of Physics*
Office number:	*Faculty members' offices*
Phone number:	*Faculty members' phone numbers*
Email:	*Faculty members' e-mails*
Contact hours:	*Faculty members scheduled*

19 Course Description:

Basic Principles of Electricity and Magnetism. Electric Field, Gauss's Law; Electric Potential; Capacitance and Dielectrics; Current and Resistance; Direct Current Circuits, Magnetic Field, Sources of the Magnetic Field, Faraday's Laws of Induction.

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20 Course aims and outcomes:

A- Aims:

1- Understanding the fundamental concepts in electricity and magnetism.

2- Utilizing physics concepts qualitatively as well as quantitatively.

3- To develop critical thinking and analytical problem-solving skills.

4- To gain an appreciation of how large a role electromagnetism plays in our daily life.

B- Students Learning Outcomes (SLOs):

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

SLOs / SLOs of the course	SLO (1)	SLO (2)	SLO (3)	SLO (4)
1: **Electric Charge and Electric Field**	Use and apply Coulomb's law	Describe the electric field properties	Calculate the electric field of point charges	Calculate the electric field of charge distributions
2: **Gauss's Law**	Calculate the electric flux	Utilize Gauss' law to calculate the electric field of symmetric charge distribution	Understand the difference conductors and dielectrics with respect to charge distribution	
3: **Electric Potential**	Calculate the electric potential nearby point charges	Calculate the electric potential of a charge distribution	Calculate the electric potential energy of a charge distribution	Understand the concept of equipotential surfaces and calculate the electric potential difference
4: **Capacitance and Dielectrics**	Calculate the capacitance of a physical object	Understand and utilize the use of capacitors in electric circuits	Calculate the equivalent capacitance of parallel/series connections	Understand the effect of dielectric materials used in capacitors
5: **Current, Resistance, and Electromotive Force**	Understand the concept of the electric current and resistivity	Understand the concept of the electromotive force (emf)	Calculate the electric potential difference across a resistor connected to an emf	Calculate the dissipated across a resistor connected to an emf
6: **Direct-Current Circuits**	Understand and utilize the use of	Calculate the equivalent	Utilize Kirchhoff's rule	Understand the principle of R-C

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21. Topic Outline and Schedule:

Chapter	Content	Suggested Exercises & Problems
21	**Electric Charge and Electric Field** 21.3 Coulomb's Law 21.4 Electric Field and Electric Forces 21.5 Electric-Field Calculations 21.6 Electric Field Lines 21.7 Electric Dipoles	**9, 13, 16, 23, 29, 48, 51, 65**
22	**Gauss's Law** 22.1 Charge and Electric Flux 22.2 Calculating Electric Flux 22.3 Gauss's Law 22.4 Applications of Gauss's Law 22.5 Charges on Conductors	**2, 5, 8, 11, 17, 21, 43**
23	**Electric Potential** 23.1 Electric Potential Energy 23.2 Electric Potential 23.3 Calculating Electric Potential 23.4 Equipotential Surfaces 23.5 Potential Gradient	**7, 8, 26, 37, 44, 68**
24	**Capacitance and Dielectrics** 24.1 Capacitors and Capacitance 24.2 Capacitors in Series and Parallel 24.3 Energy Storage in Capacitors and Electric-Field Energy 24.4 Dielectrics	**1, 17, 20, 33**
25	**Current, Resistance, and Electromotive Force** 25.1 Current 25.2 Resistivity 25.3 Resistance 25.4 Electromotive Force and Circuits 25.5 Energy and Power in Electric Circuits	**2, 7, 20, 38**
26	**Direct-Current Circuits** 26.1 Resistors in Series and Parallel 26.2 Kirchhoff's Rules 26.4 *R-C* Circuits	**4, 18, 23, 28, 39, 49, 68**
27	**Magnetic Field and Magnetic Forces** 27.1 Magnetism 27.2 Magnetic Field 27.3 Magnetic Field Lines and Magnetic Flux 27.4 Motion of Charged Particles in a Magnetic Field 27.5 Applications of Motion of Charged Particles 27.6 Magnetic Force on a Current-Carrying Conductor 27.7 Force and Torque on a Current Loop	**4, 5, 11, 27, 36, 45**
28	**Sources of Magnetic Field**	**14, 23, 43, 46, 64**

	28.1 Magnetic Field of a Moving Charge 28.2 Magnetic Field of a Current Element 28.3 Magnetic Field of a Straight Current-Carrying Conductor 28.4 Force Between Parallel Conductors 28.5 Magnetic Field of a Circular Current Loop 28.6 Ampere's Law 28.7 Applications of Ampere's Law	
29	**Faraday's Law** 29.1 Induction Experiments 29.2 Faraday's Law 29.3 Lenz's Law 29.4 Motional Electromotive Force	**1, 7, 27, 30**
30	**Inductance** 30.2 Self-Inductance and Inductors 30.3 Magnetic-Field Energy 30.4 The *R-L* Circuit	**7, 10, 17, 25**
31	**Alternating Current** 31.1 Phasors and Alternating Currents 31.2 Resistance and Reactance 31.3 The *L-R-C* Series Circuit 31.4 Power in Alternating-Current Circuits	**5, 14, 18**
33	**The Nature and Propagation of Light** 33.1 The Nature of Light 33.2 Reflection and Refraction 33.3 Total Internal Reflection	**4, 11, 17**
34	**Geometric Optics** 34.1 Reflection and Refraction at a Plane Surface 34.4 Thin Lenses 34.7 The Magnifier	**2, 28, 57**

22 Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
Midterm Exam	30				Students.com
Exam	20				Students.com
Final Exam	50				Students.com

23 Course Requirements

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Students have access to the internet and user account on Moodle and Microsoft Teams

24 Course Policies:

A- Attendance policies:

Class attendance is mandatory. A student whose absence exceeds 15% of lectures will be dismissed.

B- Absences from exams and submitting assignments on time*:*

Absence from exams without an acceptable excuse means ZERO. No grades for homework assignments. Some suggested problems will be discussed in class for every chapter.

C- Health and safety procedures:

No special precautions.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

We all follow an honor system during the whole course. The universities laws applies to students and instructors.

E- Grading policy:

The course grading follows the guidelines of the undergraduate school: 30% midterm exam + 20% Exam+ 50% Final Exam.

F- Available university services that support achievement in the course:

Class Room, Equipped Laboratory, Library, IT infrastructure

25 References:

A- Required book(s), assigned reading and audio-visuals:

"University Physics with Modern Physics", F. Sears & M. Zemansky's, 14th edition, (Pearson, Pearson

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Education Limited, 2016).

B- Recommended books, materials, and media:

1. Raymond A. Serway and John W. Jewett Jr., "Physics For Scientists and Engineers with Modern Physics", 9th edition, (Thomson Learning, Belmont, CA, USA, 2014).

2. David Halliday, Robert Resnick, and Jearl Walker, "EXTENDED PRINCPLES OF PHYSICS", 9th Edition (John Wiley & Sons, Inc., 2011).

3. Bauer Westfall, "University Physics with Modern Physics", (McGraw Hill, 2011).

4. James S. Walker, "Physics" Fourth Edition, (Addison – Wesley, 2010).

5. Giancoli, "Physics for Scientists & Engineers with Modern Physics", Fourth Edition, (Pearson Education, 2009).

6. Ohanian and Market, "Physics for Engineers and Scientists", Extended Third Edition, (W. W. Norton & Company, 2007).

26 Additional information:

Name of Course Coordinator: *Dr. Bashar Lahlouh* Signature: ---------- Date: ---------- ……..
Head of Curriculum Committee/Department: ---------- Signature: ---------- ….
Head of Department: ---------- Signature: ---------- ….
Head of Curriculum Committee/Faculty: ---------- Signature: ---------- ..
Dean: ---------- Signature: ----------