

PHYS 111

General Physics II

فيزياء عامة 2

وصف المقرر:

- قانون كولوم ، المجال والجهد الكهربائي حركة شحنة نقطية في مجال كهربائي ، المكثفات ، طاقة مكثف مشحون، التيار المستمر، قانون أوم ، المقاومة ودرجة الحرارة، الطاقة والقدرة الكهربائية، قاعدة كيرشوف، تيار الشحن والتفريغ لمكثف، قانونا الانعكاس ، المرايا وأنواعها ، إنكسار الضوء ، العدسات وأنواعها، قوانين الانعكاس والانكسار، المنشور. الانعكاس الكلي الداخلي والزوايا الحرجة، العدسات، العدسات المركبة، المجهر البسيط والمركب. مقدمة في نظرية الكم. ظواهر إشعاع الجسم الأسود ، الأثر الكهروضوئي، الأشعة السينية. خواص النواة، التحلل الإشعاعي، قانون التحلل الإشعاعي ، التفاعلات النووية، النشاط الإشعاعي .

Course Description:

- Vectors and forces analysis, Electric forces, field and potential. motion of charged particle in electric field, Capacitance, Energy of charged capacitor, Direct current (DC), Ohm's law, Resistance and temperature, energy and power, Kirchhoff's rules, Current in charged Capacitor.
- Reflection and refraction of light: reflection and refraction laws, refraction by plane- parallel plate, Prism, total internal reflection and the critical angle.
- Introduction to quantum theory, Black Body radiation, Photoelectric effect, X-Rays, Nuclear Decay, Decay Law, Nuclear reactions, Radioactivity.

PHYS 221 Electro magnetism 1

كهرومغناطيسية 1

الكهربائية الساكنة، قانون جاوس و تطبيقاته، المكثفات، المجال المغناطيسي لموصلات ذات أشكال مختلفة، قانون أمبير و تطبيقاته، الحث الكهرومغناطيسي، قانونا فاراداي ولنز، الخواص المغناطيسية للمادة، تحليل دوائر التيار المتردد، الرنين في دوائر التوالي والتوازي.

List of topics	
Vector and Scalar Fields, Electrostatics Fields, Electrostatics Force	
Gauss Law and its application, Electric potential Charge Dipoles	
Conductors and Insulators, Capacitors	
The magnetic field of conductors with different shapes, Ampere's law and its applications. Magnetic Force	
Induced electromotive force, Faraday's law, Lenz's law, magnetic properties of matter	
Analysis of AC circuits, resonance in series and parallel circuits.	

Phys104 (General Phys. 2)**COURSE SYLLABUS****Text book**

Physics for Scientists and Engineers
(6th edition)- R. A. Serway & Jewett

Chapter & Sections	Sections Contents	Examples	problems
23 <u>Electric Field</u> 3, 4, 6, 7	Coulomb's Law, The Electric Field, Electric Field Lines, and Motion of Charged Particles in a Uniform Electric Field.	1,2, 3, 5, 8, 10, 11	4, 7, 10, 14, 20, 21, 42, 45, 46
24 <u>Gauss's Law</u> 1,2, 3, 4	Electric Flux, Gauss's Law, and Application of Gauss's Law to Various Charge Distributions (Examples: 4,5,6,7,8) and Conductors in Electrostatic Equilibrium.	2, 3, 4, 5, 6, 7, 8	3,4,9,11, 21, 24, 31, 35, 37, 40,42,
25 <u>Electric Potential</u> 1, 2, 3	Potential Difference and Electric Potential, Potential Diff. in a Uniform Electric Field, Electric Potential and Potential Energy Due to point Charges.	1,2, 3	2,3, 6,16,17,20
26 <u>Capacitance and Dielectrics</u> 1, 2, 3, 4, 5	Definition & Calculating of Capacitance, Combinations of Capacitors, Energy Stored in a Charged Capacitor, Dielectrics.	1, 4, 6, 7	1, 7, 9, 18,21, 31,36, 47, 54

<p>27 <u>Current and Resistance</u> 1, 2, 4, 6</p>	<p>Electric Current, Resistance, Resistance and Temperature, Electric Power.</p>	<p>1, 2, 3, 6, 7, 8</p>	<p>1, 11, 12, 15, 16, 22, 32,33, 36, 49, 56</p>
<p>28 <u>Direct Current Circuits</u> 1, 2, 3</p>	<p>Electromotive Force, Resistors in Series and Parallel, Kirchhoff's Rules.</p>	<p>1, 4, 6, 8, ,10</p>	<p>2, 6, 8, 9, 15, 20,21, 36, 40</p>
<p>29 <u>Magnetic Field</u> 1, 2, 4, 5</p>	<p>Magnetic Fields and Forces, Magnetic Force Acting on a Current-Carrying Conductor(Up to equation 29.3), Motion of a Charged Particle in a Uniform Magnetic Field and its Applications (velocity selector)</p>	<p>1, 6, 7</p>	<p>7, 9, 12,14, 30, 37, 41</p>
<p>30 <u>Sources of the Magnetic Field</u> 1, 2, 3, 4,5, 6</p>	<p>The Biot -Savart Law(Eq.30.5 only and without proof), Magnetic Force Between Two Parallel Conductors, Ampère's Law, Mag. Field of a Solenoid, Magnetic Flux, Gauss's Law in Magnetism.</p>	<p>4, 8</p>	<p>4, 16,17, 31, 35, 63</p>
<p>31 <u>Faraday's Law</u> 1, 2</p>	<p>Faraday's Law of Induction, Motional emf.</p>	<p>1, 5</p>	<p>2, 5, 13, 20</p>
<p>32 <u>Inductance</u> 1, 3</p>	<p>Self-Inductance, Energy in a Mag. field .</p>	<p>1, 2</p>	<p>6,7, 9, 16, 29, 30, 31, 37</p>
<p>33 <u>Alternating Current Circuits AC</u> 1, 2, 3, 4, 5, 6, 7</p>	<p>AC Sources, Resistors – Inductors - Capacitors in an AC circuit, The RLC Series Circuit, Power in an AC Circuit, Resonance in a Series RLC Circuit.</p>	<p>1, 5, 6, 7</p>	<p>3, 10, 17,21,22 26, 32, 33, 37</p>

Course Evaluation

<i>Exam</i>	<i>Marks</i>	<i>Date</i>	<i>Notes</i>
1 st Midterm			
2 nd Midterm			
Lab Exp. Report & Exam			
Final	40		
TOTAL	100		