

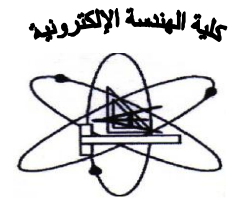


Department offering the program: Electronics and Electrical Communications  
Department offering the course: Computer Sciences and Engineering

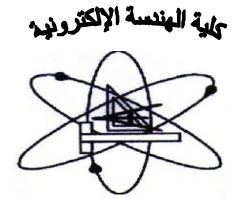
## Course Specification

1- Course basic information :		
Course Code: <b>PME 022</b> Department requirement	Course Title: <b>Physics (2)</b>	Academic year: <b>2014-2015</b> Level (0) – Semester : <b>2<sup>nd</sup></b>
Field: <b>Mathematics and Basic Science</b>	Teaching hours: Lecture <input type="text" value="2"/> Tutorial <input type="text" value="1"/> Lab <input type="text" value="2"/>	

2- Course Objectives	<ol style="list-style-type: none"><li>1. To teach students the fundamentals of electrostatic fields due to static charges.</li><li>2. To provide students with basic laws and theories in electrostatics.</li><li>3. To introduce the concepts of electric potential and Capacitance.</li><li>4. To teach students the concepts of steady magnetic field due to dc currents.</li><li>5. To provide students with basic laws and theories in steady magnetic fields.</li><li>6. To introduce students to the concept of inductance and magnetic properties of matter.</li><li>7. To introduce students to the concepts of Maxwell's equations, Geometrical optics and fiber optics.</li></ol>
3- Intended Learning Outcomes: ARS	Course ILOs



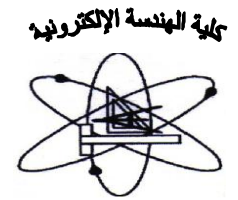
<b>A- Knowledge and Understanding:</b>	<p>A.1 Explain concepts and theories of mathematics and sciences appropriate to Electricity and magnetism.</p> <p>A.3 Define characteristics of engineering materials related to Electricity and magnetism.</p> <p>A.5 Demonstrate methodologies of solving engineering problems, data collection and interpretation</p>	<p>A1.1 Explain the concepts of Charge and matter, and electric field.</p> <p>A1.2 Explain the concepts of Gauss's Law and electric flux density.</p> <p>A1.3 Explain the concepts of Electric Potential, Energy and Capacitance.</p> <p>A1.4 Explain the concepts of Current and Resistance.</p> <p>A1.5 Explain the concepts of Magnetic Field, Ampere's Law, Faradays Law, and Inductance.</p> <p>A1.6 Explain concepts and theories of mathematics and sciences appropriate to Maxwell's equations, Geometrical optics and fiber optics.</p> <p>A3.1 Define the characteristics of dielectrics, and magnetic materials.</p> <p>A3.2 Define the characteristics of fiber optics.</p> <p>A5.1 Demonstrate methodologies of solving Electrostatics Field problems using Coulomb's, or Gauss's Law.</p> <p>A5.2 Demonstrate methodologies of solving Potential, Energy and Capacitance problems.</p> <p>A5.3 Demonstrate methodologies of solving Magnetostatics field problems using Ampere's or Biot-Savart's Law.</p> <p>A5.4 Demonstrate methodologies of solving inductance problems.</p>
<b>B- Intellectual Skills</b>	<p>B.2 Select appropriate solutions for engineering problems based on analytical thinking.</p>	<p>B2.1 Select appropriate solution for electrostatic field problems based on analytical thinking using Coulomb's Law or Gauss' Law.</p> <p>B2.2 Select appropriate solution for electric potential, energy and capacitance problems based on analytical thinking</p> <p>B2.3 Select appropriate solutions for steady magnetic field problems based on analytical thinking using Ampere's Law, Biot-Savart's Law, or Faradays Law.</p>



<b>C- Professional Skills</b>	<p>C.1 Apply knowledge of mathematics, science, and engineering practice integrally to solve engineering problems.</p> <p>C.5 Use measuring instruments, and lab-oratory equipment to collect, analyze and interpret results</p> <p>C.12 Prepare and present technical reports.</p>	<p>C1.1 Apply knowledge of mathematics, science, and engineering practice integrally to determine electric potentials, energy and capacitance in electrostatic field problems.</p> <p>C1.2) Apply knowledge of mathematics, science, and engineering practice integrally to determine the inductance in steady magnetic field problems.</p> <p>C5.1 Use measuring instruments and laboratory equipment to realize Ohm's Law for a capacitance.</p> <p>C5.2 Use measuring instruments and laboratory equipment to realize Ohm's Law and determine the specific resistance for a wire material.</p> <p>C5.3 Use measuring instruments and laboratory equipment to determine the relation between potential difference and current for Tungsten filament.</p> <p>C5.4 Use measuring instruments and laboratory equipment to determine self-inductance for a coil.</p> <p>C5.5 Use measuring instruments and laboratory equipment to determine focal distance for Lenses and Mirrors</p> <p>C12.1 Prepare and present technical reports on experimental work and results relevant to the realization of Ohm's Law for resistances and capacitances.</p> <p>C12.2 Prepare and present technical reports on the determination of magnetic field intensity for Earth.</p> <p>C12.3 Prepare and present technical report on the determination of focal distance for Lenses and Mirrors.</p>
	<b>D- General Skills</b>	<p>D.3 Communicate effectively</p> <p>D.6 Effectively manages tasks, time, and resources.</p> <p>D.7 Search for information and engage in life-long self-learning discipline.</p>
<b>4- Course Contents</b>	Charge and matter – electric field – Gauss law – electric potential – capacitors and dielectrics – current, resistance and electromotive force – magnetic field – Ampere's law and Biot-Savart's law – Faraday's law of induction – inductance – magnetic properties of matter – Maxwell's equations – Geometrical optics and fiber optics.	
<b>4- Lab. Experiments</b>	اسم التجربة	رقم التجربة



	١	تحقيق قانون اوم وتعيين المقاومة النوعية لمادة السلك.
	٢	الحيود عن قانون اوم وإيجاد العلاقة بين فرق الجهد على فتيل مصباح التنجستين وبين شدة التيار المار فيه.
	٣	تعيين الحث الذاتي لملف بتوصيله باستخدام تيار متردد.
	٤	تحقيق قانون أوم لمكثف باستخدام تيار متردد.
	٥	تخطيط المجال المغناطيسي (خطوط القوى) لقضيب مغناطيسي ومغناطيس على شكل حدوه فرس.
	٦	تعيين البعد البؤري لعدسة محدبة (ومرآة مفرقة) وأخرى مفرقة باستخدام مرآة مستوية.
	٧	تعيين البعد البؤري لمرآة لامة ومعامل انكسار لسانل.
	٨	تعيين شدة المجال المغناطيسي للأرض.
<b>5- Teaching and Learning Methods</b>		<ul style="list-style-type: none"><li>- Lectures</li><li>- Tutorials</li><li>- Laboratory experiments.</li><li>- Reports</li></ul>
<b>6- Teaching and Learning Methods for disable students</b>		<ul style="list-style-type: none"><li>• Official low cost special classes for developing student skills, arranged by the faculty administration.</li><li>• Assign a portion of the office hours for those students.</li><li>• Face-to-face intermediate solving the problems and quizzes during the tutorials, and Laboratory times.</li><li>• Repeat the explanation of theoretical and practical material in tutorials, and laboratory times.</li></ul>
<b>7- Student Assessment</b>		
<b>a- Assessment Methods</b>		<ul style="list-style-type: none"><li>- Weekly sheet exercises at class room</li><li>- Quizzes</li><li>- Labs and Reports.</li><li>- Midterm, and final exams</li></ul>
<b>b- Assessment Schedule</b>		<ul style="list-style-type: none"><li>- Exercise sheet or Lab assignment: Weekly</li><li>- Quizz-1: Week no 5</li><li>- Mid-Term exam: Week no 8</li><li>- Quizz-2: Week no 10</li><li>- Lab exam: Week no 15</li></ul>



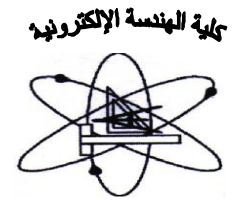
	- Final – term examination: <span style="float: right;">Week no 16-17</span>
<b>c- Weighting of Assessment</b>	- Semester work and quizzes: 10 % - Mid-term examination: 10 % - Oral and practical exam: 20 % - Final – term examination: 60 % <div style="text-align: right;">Total 100 %</div>
<b>8- List of text books and references:</b>	
<b>a- Course notes</b>	There are lectures notes prepared in the form of a book authorized by the department
<b>b- Text books</b>	[1] David Halliday and Robert Resnick, "Fundamentals of Physics", 7 <sup>th</sup> edition , John Wiley, 2007.
<b>c- Recommended books</b>	[1] W,Sears, M.W.Zemansky and H.D. Young, "University Physics", Addison-Wesley Company, 2003. [1] Raymond A. Serway and John W. Jewett, Jr., "Physics for Scientists and Engineers with Modern Physics", 8E, Brooks Cole, 2009.
<b>d- Periodicals, Web sites ...etc</b>	<a href="http://hyperphysics.phy-astr.gsu.edu/hbase/hph.html">http://hyperphysics.phy-astr.gsu.edu/hbase/hph.html</a>

#### Course contents - ILOs Matrix

Content Topics	Week	A- Knowledge & Understanding	B- Intellectual skills	C- Professional and practical skills	D- General and transferable skills
Charge and matter - electric field	1-2	A1.1			D3.1,D6.1
Gauss's Law	3	A1.2, A5.1	B2.1		D3.1,D6.1
Electric potential, Capacitors and dielectrics	4-5	A1.3, A3.1, A5.2	B2.2	C1.1, C5.1, C12.1	D3.1,D6.1, D7.1
Current, resistance and electromotive force –	6-7	A1.4		C5.2, C5.3, C12.1	D3.1,D6.1
The Magnetic Field- Ampere's law and Biot-Savart's law	9-10	A1.5, A5.3	B2.3		D3.1,D6.1
Faraday's law of induction – inductance – magnetic properties of matter.	11-12	A1.5, A3.2, A5.4	B2.3	C1.2, C5.4, C12.2	D3.1,D6.1
Maxwell's equations	13	A1.6			D3.1,D6.1, D7.2
Geometrical optics and fiber optics	14-15	A1.6, A3.2		C5.5, C12.3	D3.1,D6.1, D7.3

#### Teaching and Learning Methods - ILOs Matrix

Teaching and Learning Methods	A- Knowledge & Understanding	B- Intellectual skills	C- Professional and practical skills	D- General and transferable skills
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Lectures	A1, A3, A5	B2	C1	
Tutorials/ Labs.	A1, A3, A5	B2	C1, C5	D3,D.6
Exercises	A1, A3, A5	B2	C1	D.6,D.7
Reports and assignments	A1, A3, A5	B2	C1,C12	D.6,D.7

#### Assessment Methods - ILOs Matrix

Assessment Methods	A- Knowledge & Understanding	B- Intellectual skills	C- Professional and practical skills	D- General and transferable skills
Weekly sheet exercises	A1, A3, A5	B2	C1	D3, D6, D7
Reports/Labs/Assignments	A1, A3, A5	B2	C1, C5, C12	D3, D6, D7
Lab. Exam	A1, A3, A5	B2	C1, C5	D3, D6
Quizzes, Midterm, and Final Written exams	A1, A3, A5	B2	C1	D6

Authorized from department board at 15/05/2016

Authorized from college board at 05/06/2016

**Course coordinator:**  
Prof.Dr.Mohamad Dawoud

**Head of Department:**  
Prof. Fathi El-Sayed Abd El-Samie